

# Sustainable Economic Development Based on Smart Technology Innovation: Creating an Intelligent Future

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**Abstract**—Innovation has been a primary human task throughout history. The ultimate goal of innovation is to create a smart and better future. Technology, science, and innovation are essential tools for achieving the SDGs. This study explores sustainable economic development based on smart technology innovation to create a smart future. This study uses a literature review method in an effort to convey relevant research directions and applications from selected literature to readers and discusses the main contributions of the selected literature, implementation considerations, challenges, and potential for creating a smart future through sustainable economic development based on smart technology innovation to encourage the development of relevant research in this field. The study used is an exploratory study that provides output on existing data, as well as an explanation of a discovery so that it can be used as an example for research studies in compiling or creating a clear discussion of the contents of the problem to be studied. The results of the literature review indicate that sustainable economic development based on smart technology can create a smart future. The benefits of smart technology innovation can be felt by every individual, community group, community, industry, country, region, and even the world. Sustainable economic development relies on smart technology innovation to optimize resource use, increase efficiency, and create jobs, enabling the realization of smart cities, efficient energy management, and a circular economy by reducing waste and encouraging sustainable practices, ultimately enabling a smart future.

**Keywords:** Sustainable Economic Development; Innovation; Smart Technology; Future

## 1. INTRODUCTION

The 21st century has marked the beginning of a technological revolution, with intelligent technology, also known as smart technology, leading changes in the way we live, work, and interact. In the transition from the fourth to the fifth industrial revolution, we have become accustomed to the rapid pace of innovation, and we continue to expect increasingly effective and efficient technological solutions. We live in a dynamic and turbulent global community. Megatrends, including rapid changes in globalization and technological advancements, are creating new market forces. For any organization to survive and thrive in such an environment, innovation is crucial. However, innovation is no longer simply about creating value for individuals, organizations, or society. The ultimate goal of innovation should be much broader: helping create an intelligent future where everyone can enjoy the best quality of life. Based on this, innovation must seek intelligent solutions to address key social problems, seeking a more proactive approach to predicting a potentially uncertain future and implementing strategies to eliminate challenges or obstacles to an intelligent future.

Based on the above, innovation has been a primary human task throughout history (Lee, 2015). To survive and improve the quality of life, continuous innovation efforts are essential. All major revolutionary waves in human history, agriculture, industry, information, and now convergence, have all focused on innovation to create new and better values (Lee et al., 2012).

Political leaders are emphasizing the importance of innovation for social justice and a better environment for every citizen. Global executives must also emphasize the importance of continuous innovation for new products or services and for customer engagement, yet 94 percent are dissatisfied with their innovation performance (Christiansen et al., 2016). Nonprofit managers pursue innovation to challenge the social ills of economic inequality, digital inequality and purpose inequality (Lee, 2015). The purpose of innovation goes far beyond simply creating greater customer value, a better competitive advantage for companies, and an environment that improves the quality of life. The ultimate goal of innovation should be to create a smarter and better future. Furthermore, the benefits of innovation can be felt by every individual, group, community, industry, country, region, and even the world. What all these entities have in common is their pursuit of innovation to prepare for a better future (Canton, 2015). Mission-oriented innovation policies can guide and stimulate entrepreneurial activity to achieve social goals. Governments can create a conducive environment by providing financial incentives, regulatory support, and infrastructure investments that encourage sustainable business practices (Mazzucato, 2013).

On the other hand, the term "smart" or "intelligent" has been widely used in today's advanced technological era, such as the use of terms such as smart phones, smart cars, smart homes, smart infrastructure, smart cities, smart countries, and so on. The term "smart" represents a concept of hope and aspiration that depends on one's perspective. A smart situation depends on one's conditions, environment, culture, and value system. However, the general concept of a smart future should mean a living environment that is far better than the current state. This statement is in accordance with the concept of sustainable economic development echoed throughout the world, where current economic progress does not compromise the ability of future generations to meet their needs, thus creating a balanced, resilient, and intelligent society.

Therefore, a smart future should be a place of innovation that will help develop intelligent solutions to address complex problems with the aim of securing a humane environment (Streitz, 2015). In such a smart future, people can be more free to pursue opportunities for learning and growth, engage in good relationships, be happy with their communities and workplaces and also have a comfortable and healthy lifestyle with adequate financial resources (Gallup-Healthways, 2014). Creating a smart future like the one above requires more than just smart gadgets, advanced technology, convergence strategies and government support, but requires a network of soft innovations that can nurture an aspirational future, namely social justice, rule of law, transparency, accountability, collective wisdom of a cohesive society and a shared vision and goals (Kramer et al., 2016).

One example is that energy technology has become a top priority for all countries. Advances in energy technology have become a social and economic development strategy for the benefit of the world and humanity, as well as a historic opportunity for sustainable development. Innovation in renewable energy technology enables new growth in the energy sector. Implementing a technological innovation strategy requires guidance and direction from policymakers, who need to develop standards and safeguards, as technological innovation has a specific economic and policy support base. By emphasizing the advancement of energy technology, not only does it develop a clear strategy for new energy innovation but also policies to encourage new energy innovation, energy production, and energy-related jobs.

Energy is the material basis of national development that supports national economic development. With continuous and rapid economic growth, energy issues have become an obstacle to sustainable economic and social development, and countries around the world are paying attention to its impact. The development and utilization of new energy are inseparable from the support of technological innovation. Technological innovation is an essential part of the philosophy of technology and the embodiment of value theory. At the current stage of economic and ecological development of new energy, contradictions in social values can be overcome, because these contradictions can be resolved through technological innovation (Li & Ge, 2023). The technological innovation in question is smart technological innovation.

Technology, science and innovation are important tools to achieve the SDGs, which address issues of health, clean water, climate change, renewable energy and clean energy because technology, science and innovation can help achieve progress in all the SDGs (The Joint Research Centre: EU Science Hub, 2025). Global sustainable development depends heavily on the fundamental transformation of energy systems, so it is necessary to emphasize the central role of technological innovation in the continuous improvement of the legal and policy environment that supports the development of energy science and technology, it is necessary to provide the necessary direction for strategic planning and the gradual formulation of technical objectives to realize sustainable development as well as planning the direction of development, and to quickly formulate and revise existing national and industrial standards (Deyu et al., 2020).

The development paradigm has shifted to "digital by default" as the norm, reshaping societies and economies. As a hub of digitally driven innovation, the Asia Pacific region is well-positioned to harness the transformative potential of digital technologies to accelerate progress toward achieving the Sustainable Development Goals (SDGs) mandated by the United Nations (Alisjahbana & Madiyev, 2024).

Sustainable economic development relies on smart technology innovation to optimize resource use, increase efficiency, and create green jobs. Smart technologies such as AI (Artificial Intelligence) and IoT (Internet of Things) are enabling smart cities, efficient energy management, and a circular economy by reducing waste while encouraging sustainable practices. This approach helps achieve economic goals while minimizing environmental impact (Zhang & Khaskheli, 2025). This is supported by Al-Raeei's research, which states that AI has the power to transform urban environments and create more sustainable and resilient communities. By harnessing AI's capabilities, cities can become more efficient, environmentally friendly, and ready to face future challenges. It is crucial for policymakers, urban planners, and technology developers to work together to harness the full potential of AI in sustainable urbanization and create a better future for all. Proactively addressing these challenges can unlock AI's full potential in championing sustainable cities and building a sustainable future for all people worldwide (Al-Raeei, 2024). By looking at the results of this research, the integration of technological innovation into sustainable development presents an opportunity to address pressing global challenges such as climate change, resource scarcity and social injustice (Harfouche et al., 2024).

The conceptual boundaries are taken as reported in the UPPCS magazine, it is known that the role of smart technology in sustainable development is: 1) Smart energy systems and renewable technologies: The transition to clean and renewable energy sources is a key goal of sustainable development. Smart technologies improve energy efficiency and optimize resource use in the following ways: a) Smart network: An IoT-enabled smart network can improve energy distribution, reduce energy losses, and integrate renewable sources such as solar and wind power, b) Artificial Intelligence (AI)-powered energy management: AI algorithms predict energy demand, optimize electricity usage, and prevent energy waste in homes and industries, c) Blockchain in energy trading: Decentralized blockchain networks enable peer-to-peer energy trading, allowing consumers to sell excess solar energy to the grid; 2) Smart transportation and green mobility: The transportation sector is one of the largest contributors to greenhouse gas emissions. Smart technology is transforming mobility by promoting environmentally friendly transportation solutions: a) Electric Vehicles (EVs) and Smart Charging: AI-powered smart grids ensure efficient EV charging, reducing the burden on the electric power system, b) Internet of Things (IoT)-based traffic management: Smart traffic systems use sensors and AI to optimize traffic flow, reducing congestion and emissions, c) Autonomous and Shared Mobility: Driverless electric

vehicles and smart ride-sharing services minimize energy consumption and increase efficiency, 3) Sustainable agriculture through precision farming: Agriculture must become more efficient and environmentally friendly to meet the food needs of a growing global population. Smart agricultural technologies help reduce waste, conserve water, and increase productivity: a) IoT-based smart irrigation: Sensors monitor soil moisture levels and optimize water use, preventing over-irrigation, b) AI-based crop monitoring: AI algorithms analyze satellite imagery and drone data to detect plant diseases and predict crop yields, c) Blockchain for supply chain transparency: Blockchain ensures traceability in the food supply chain, reduces food waste, and encourages fair trade, 4) Smart cities for sustainable urban development: Rapid urbanization makes sustainable urban planning crucial. Smart city technologies help reduce resource consumption and improve residents' quality of life: a) IoT-based smart waste management: Smart trash bins with fill-level sensors optimize waste collection and encourage recycling, b) AI-based energy efficiency: AI controls smart lighting and HVAC (Heating, Ventilation, and Air Conditioning) systems, reducing energy waste in buildings, c) Green infrastructure: Sustainable architecture integrates solar panels, vertical gardens, and rainwater harvesting to reduce environmental impact; 5) Water conservation and smart water management: Water scarcity is a growing global problem. Smart technologies enable efficient water management by reducing waste and improving distribution: a) IoT-based smart meters: These meters track water consumption in real time, detect leaks, and improve water conservation, b) AI-based water treatment: AI improves water purification by optimizing treatment processes and reducing chemical use, c) Water desalination and recycling: Advanced filtration and desalination technologies provide sustainable water solutions; 6) AI and Big Data for Environmental Monitoring: Real-time environmental monitoring helps governments and organizations address pollution and climate change. AI and big data analytics improve decision-making through: a) Air quality monitoring: IoT sensors track air pollution levels, enabling targeted actions to reduce emissions, b) Climate prediction models: AI-powered simulations predict climate trends and natural disasters, aiding disaster preparedness, c) Deforestation and wildlife conservation: AI-powered drones and satellite imagery monitor forests and protect biodiversity (UPPCS Magazine, 2025).

Despite the many benefits of smart technology, Magazine also suggests that there are several challenges that could hinder the widespread adoption of smart technology for sustainability, namely: 1) High initial costs: Investing in "smart" infrastructure requires a high capital outlay, 2) Data privacy concerns: IoT and AI rely on data collection, raising security concerns, 3) Technological limitations: Developing countries may lack access to advanced technologies, 4) Resistance to change: Industry and governments may be slow to adopt new technologies, 5) Regulatory and policy gaps: Inconsistent regulations hinder the development of sustainable solutions. Looking ahead, several emerging trends will shape the future of sustainable development, and by embracing these technologies, the world can move towards a smarter, greener, and more sustainable future. These are: 1) An AI-based circular economy: AI and IoT will improve waste reduction and resource efficiency, 2) 5G and Edge Computing: Faster connectivity will enable real-time monitoring of smart grids and smart cities, 3) Advances in green technology: Innovations in biodegradable materials, carbon capture, and energy storage will drive sustainability, 4) Stronger government policies: Stricter regulations will encourage businesses to adopt sustainable practices (UPPCS Magazine, 2025).

Furthermore, regarding smart technology innovation, the primary goal of every organization is value creation. The value sought can be financial, public welfare, social justice, or even psychological. Regardless of the type of organization, whether a government agency, business entity, non-profit organization, or charity, there is a value chain architecture. Essentially, there are five areas where value can be created through innovation: 1) New products, services, ventures, or projects; 2) Redesigning the overall value chain architecture for greater efficiency; 3) Reinventing customer value, from utility to hedonic to experiential; 4) Redefining the customer base, including e-marketplaces, global markets, and blue oceans; 5) Reforming business models using new ICTs, including IoT (Lee & Olson, 2010).

Based on the above, every organization has a mission, vision, goals, objectives, and strategic plan. The goal of all organizational efforts is to make the value creation areas described above more effective. Therefore, organizations need to consider how to prioritize and/or balance these five value creation areas so that their innovation efforts are appropriately focused and maximize organizational performance. Leaders already know that innovation requires a distinct set of activities, skills, methods, metrics, mindsets, and leadership approaches. They understand that creating new businesses and optimizing existing businesses are two very different management challenges (Govindarajan, 2016).

The main question based on the description above is: what is a model of sustainable economic development based on smart technology innovation? and is it true that sustainable economic development based on smart technology innovation can create an intelligent future? To answer this, this study is to find out more deeply by exploring "Sustainable Economic Development Based on Smart Technology Innovation: Creating an Intelligent Future" from several studies that have been conducted previously as material to find and provide new perspectives as scientific insights to be applied in the future as well as to gain initial understanding and also to generate new ideas or hypotheses.

## 2. RESEARCH METHODS

The study used is an exploratory study using a literature review approach that provides output based on existing data and an explanation of findings so that they can serve as examples for research studies in compiling or creating clear discussions of the content of the problem being studied. This exploratory study aims to investigate a topic that is not

widely known to gain initial understanding and generate new ideas or hypotheses. The criteria for selecting articles are determined based on the relevance of their content to the research questions outlined in the introduction. The article sources are obtained from secondary sources, including books, articles or journals and reports that have been the subject of analysis. Data is obtained from internet sites that have good quality studies or literature materials from Scopus indexed international journals and national journals that are appropriate or related to the title: "Sustainable Economic Development Based on Smart Technology Innovation: Creating an Intelligent Future" so that it can be used as a strong foundation in the content or discussion and further research.

### 3. RESULTS AND DISCUSSION

#### 3.1 Results

Based on the results of the search for data related or relevant to the theme raised, several previous studies were found as reference material or a strong foundation for the content or discussion and solutions with the following description:

- a. Yizhi Zhang and Muhammad Bilawal Khaskheli's research, which examines the central position of digital technology as a stimulator of sustainable economic progress, examines the complementary convergence between environmental policy, legal and economic structures that drive progress with the aim of finding and exploring convergent strategies in utilizing digital innovation towards sustainability goals by comparing China, the European Union and the United States where the results state that new technologies improve the effectiveness, transparency and enforcement of environmental laws. The US excels in economic dynamism, technological growth, high FDI, the rule of law, and governance transparency, but lags behind in income-social inequality and healthcare disparities. China excels in economic growth, state-led infrastructure, poverty reduction, environmental expansion, and renewable energy investment. The sustainability of integrating green policy conceptual models varies by region. The EU is based on the pros and cons of variables and indicators, showing the benefits of regulation but the drawbacks of high costs. The US demonstrates the benefits of innovation and the drawbacks of fragmentation, while China demonstrates its strengths in rapid implementation but also weaknesses in law enforcement and transparency. The model demonstrates strengths in sustainability, including the ability to rapidly implement large-scale green projects and long-term strategic thinking to balance national resources with environmental goals. For example, a smart city digital twin reduces energy waste by 15%, while a circular IT model reduces expenses by 35% and extends equipment life. The green dynamics of SMEs drive economic growth, and blockchain makes supply chains more transparent and reduces carbon footprints by 15–18%. Digital innovations, such as AI-powered carbon monitoring and ESG fintech solutions, are transforming industries toward net zero. These drivers are policy guidelines (APEC's green agenda), cross-sector partnerships, and horizontally scalable digital platforms that bring sustainability to the masses for SMEs (Zhang & Khaskheli, 2025).
- b. Fernandez and Aman's research identifies and understands the challenges that arise along with the implementation of Robotic Process Automation (RPA) technology because a clear understanding of these problems can help organizations to propose new ideas in addressing problems and in their study identified implementation challenges that require organizational change in global business services, showing the complexity beyond simple technology adoption. The results of the study stated that organizations face various challenges and problems during and after the implementation of RPA technology. Some of these challenges include limited tasks that can be automated, system failures, and data security and privacy issues. Processes to be automated must have sufficient volume and transactions, as high-volume transactions offer organizations better opportunities for cost savings, and rules-based processes are found to be easier to automate. The study also states that proper planning during RPA implementation and a strong security team are crucial in addressing the challenges organizations face (Fernandez & Aman, 2021).
- c. Kuzior et al.'s research in Ukraine found that the informatization of innovative technologies significantly improves macroeconomic indicators and socio-economic development processes in a circular economy. Their study also found that the development of informatization of innovative technologies is one of the most progressive means for economic development and growth. Informatization of technology, as a general utility, influences the strengthening of economic interactions within the economic system and can be widely used as an effective tool for technological and organizational innovation in various economic sectors. Through the use of modern innovative technologies, companies have the opportunity to match production volumes with demand in real time, identify new sales and distribution channels, optimize organizational structures, define production structures in accordance with legislation, improve service quality, and enhance the country's macroeconomic growth. The results of this study also predict GDP levels as one of the factors influencing environmental safety (Kuzior et al., 2023).
- d. Kam K.H. Ng et al.'s research in their literature review reviews how to leverage capabilities in intelligent automation, robotic process automation with artificial intelligence to catalyze business growth that outlines and consolidates scattered knowledge from current research in the literature systematically that provides a comprehensive analysis of the technical challenges and implementation of intelligent automation in real-world applications where the results of their study provide systematic evidence that intelligent automation that combines robotic process automation, artificial intelligence and soft computing goes beyond traditional decision making and covers a wide range of organizational contexts. Organizations are increasingly recognizing that automated systems represent strategic enablers rather than mere operational tools (Ng et al., 2021).

- e. Grebski and Mazur's research, conducted in the United States and Poland, focused on determining the level of social support for innovative activities. This study allows us to study the social climate that strengthens and inhibits innovative behavior in both countries. A key element in the social acceptance aspect is the perception of innovation from the perspective of corporate social responsibility, the responsibilities of business leaders and engineers, and sustainable development. Innovative individuals in the United States feel more empowered because their innovative behavior is supported by others. This is because innovative individuals in the United States have better access to services provided by business incubator centers (Grebski & Mazur, 2022).
- f. The article by Muhammad Anhar Wiradinata and Anas Malik, themed "Innovation and Technology to Support Sustainable Economic Development in Indonesia's Digital Era," discusses the strategic role of technology and innovation in addressing development challenges, such as digital infrastructure inequality, lack of human resource skills, and suboptimal regulations. It outlines the potential for transformation in key sectors, including agriculture, manufacturing, energy, and MSMEs, through the adoption of technological solutions and focuses on strategies such as improving digital infrastructure, empowering human resources, and policy reform. The study concludes that through equitable digital infrastructure development, Indonesia has the potential to adopt a sustainable circular economy model through a collaborative approach between the government, the private sector, and the community to create an inclusive and sustainable innovation ecosystem (Wiradinata & Malik, 2024).

### 3.2 Discussion

Sustainable development refers to the contrast between sustainable economic development and economic growth and the management of natural resources, including renewable energy. Renewable energy is energy derived from natural resources that can be naturally renewed in a relatively short time, such as sunlight, wind, water, geothermal energy, and biomass. This type of energy is considered more environmentally friendly because it produces significantly lower greenhouse gas emissions than fossil fuels. This is evident from the results of a study by Grebski and Mazur, which stated that achieving sustainable development requires the consistency of three key elements: economic growth, social inclusion, and environmental protection. These key elements are interrelated and all vital to the well-being of individuals and society as a whole (Grebski & Mazur, 2022).

However, its management varies from country to country due to several influencing factors. This indicates that sustainable development has become a global priority as countries strive to balance economic growth, environmental protection, and social welfare. With growing concerns about climate change, resource depletion, and pollution, innovative solutions are needed to ensure a sustainable, intelligent future. Sustainable economic development is a development process that aims to meet the needs of the present without compromising the needs of future generations, by harmonizing economic growth, social equity, and environmental sustainability. This strategy involves responsible natural resource management, investment in environmentally friendly technologies, and institutional or organizational reforms to ensure long-term prosperity. Smart technologies, including artificial intelligence (AI), IoT, blockchain, and renewable energy systems, play a critical role in driving sustainable economic development by increasing efficiency, reducing waste, and promoting environmentally friendly practices.

Computers, robots, semiconductors, mobile phones or smartphones, the internet, GPS, IoT technology, platforms and applications, and other advanced devices are just examples of technological solutions that, in the trend of sustainable economic development, influence companies and society, forcing changes to the process of creating a product, producing it, distributing it, and applying it. In this case, for years, the development of civilization has not been thought about by humans in depth. Moreover, the emergence of beneficial human inventions such as the steam engine, electricity, and the internal combustion engine has not always been beneficial to the natural environment. Over the years, these extensive economic practices have resulted in the degradation of natural ecosystems. Ecosystem degradation is defined as the decline in quality and damage to the structure and function of a natural ecosystem due to natural factors or human activities. The impacts can include loss of biodiversity, climate change, natural disasters, and clean water shortages. The causes of ecosystem degradation consist of two parts: human factors and natural factors. These human factors include: deforestation, pollution, mining, poor agricultural practices, overhunting and fishing, land conversion, and overexploitation of natural resources. Meanwhile, natural factors include: natural disasters, erosion, and abrasion. Therefore, to halt this process, it is necessary to shift to the concept of intelligent innovation transformation, focusing on sustainable economic development. This intelligent innovation transformation has been proven to be effective in Ukraine, as evidenced by research by Kuzior et al. (2023), which states that the informatization of innovative technologies significantly improves macroeconomic indicators and socio-economic development processes in circular economy conditions.

From a digital economic perspective, research by Xiaying Feng et al. found that the digital economy significantly promotes sustainable development in underdeveloped regions of western China. The digital economy is an economic system that was formed under the influence of the development of the internet and e-commerce. Each dimension of the digital economy—digital infrastructure, digital industrialization, industrial digitalization, and digital innovation—has a significant positive impact on sustainable economic development (Feng et al., 2025).

From a smart technology perspective, smart technology does not directly impact environmental sustainability, but it significantly improves business sustainability, which ultimately has a positive impact on environmental sustainability. This suggests a mediated relationship, where the implementation of smart technology strategies is crucial to achieving sustainable environmental goals (Kumar et al., 2024).

Similarly, research related to smart technology innovation is in accordance with the results of research by Ciacci et.al which states that higher GDP per capita enables more effective digital development in all three dimensions, facilitating technology adoption, innovation, digital education, and strengthening digital foundations. The digital economy plays a crucial role in helping achieve the Sustainable Development Goals (SDGs) by facilitating resource efficiency and environmental conservation. The environmental sustainability of digital technology enables smart energy management and pollution monitoring leading to sustainable production and urban planning. IoT sensors and systems are used to track environmental indicators, which helps reduce greenhouse gas emissions and increase renewable energy sources. The economic sustainability of the digital economy enables the transformation towards a circular and digital sharing economy, which encourages sustainable production and infrastructure planning. Industrial agglomeration, driven by the digital economy, significantly influences sustainable development with regional variations in its success (Ciacci et al., 2025).

Innovation should not be a passive pursuit of future intelligence by preparing for an uncertain future through a predictive, adaptive, and agile approach. Instead, innovation should be more aggressive and active in creating an intelligent future that provides more opportunities for a better quality of life. Aggressive and active innovation in creating an intelligent future involves a proactive approach to opportunity creation and quality improvement. Rather than simply reacting to uncertainty, this approach focuses on shaping the future through deliberate action. An active innovation approach means not only preparing for an uncertain future, but actively engineering a desired future.

According to Carayannis and Morawska-Jancelewicz, the accelerated progress of advanced technology in the form of digitalization, virtualization, internetization, and automation has resulted in a recalibration of the economy and society over the last century (Era 1.0 - 4.0). This transformation has not only led to the advancement of civilization, but also to destruction, which has contributed to environmental degradation. Therefore, Carayannis and Morawska-Jancelewicz state that, to continue the path of socio-economic change requires something called sustainability, namely only implementing solutions that will not harm the earth, which is recognized as a natural ecosystem according to the Latin adage "Primum non nocere" which means "first, do no harm." For this to be implemented, it is necessary to manage resources wisely based on intelligent methods, techniques and technologies in the form of "smart" actions. Such behavior is fundamentally related to intelligent computer technology (ICT), which means that socio-economic transformation is based on the implementation and availability of technologies that are characterized by their existence time (Carayannis & Morawska-Jancelewicz, 2022).

However, the biggest challenge for some countries in the world, including Indonesia, to carry out this transformation according to UPPCS Magazine is the limitations of the technology itself, which is triggered by the availability of the existing budget from each country, especially countries with weak economies or developing economies, which is caused by the transition that will be carried out requiring high initial costs, then caused by concerns about data privacy, resistance to change and gaps in regulations and policies. This could be due to individuals involved in and connected to a country's economy, such as entrepreneurs in manufacturing or other industries that can cause environmental damage. This means that if transformation were to occur, entrepreneurs and other stakeholders would have to spend a significant amount of money, raising the question: are they willing to undertake this? This question will be difficult to realize or answer for countries with weak or developing economies, including Indonesia, because according to Zhang & Khaskheli (2025), sustainable economic development depends on smart technology innovation to optimize resource use, increase efficiency, and create green jobs. This is in line with UPPCS magazine, which states that intelligent technologies such as AI and IoT enable the realization of smart cities, efficient energy management, and a circular economy by reducing waste and encouraging sustainable practices. This approach helps achieve economic goals while minimizing environmental impact (UPPCS Magazine, 2025). However, according to a study by Muhammad Anhar Wiradinata and Anas Malik, through equitable digital infrastructure development, Indonesia has the potential to adopt a sustainable circular economic model through a collaborative approach between the government, the private sector, and the community to create an inclusive and sustainable innovation ecosystem (Wiradinata & Malik, 2024). Furthermore, appropriate regulations are also necessary to ensure that every component involved in environmental matters, especially within companies, can comply with applicable regulations. This is evident in Kulin and Sevä's opinion, which states that environmental regulations can compel companies to adopt green technologies by establishing stringent environmental emission standards and energy efficiency standards. This not only helps reduce environmental pollution but also creates market demand for green innovation (Kulin & Sevä, 2019).

Based on the above description, it can be seen that sustainable economic development relies heavily on smart technology innovation to boost productivity and efficiency while reducing environmental impact, thereby creating a smart future. Key areas include optimizing resource utilization through improved energy management with AI, data analytics, and the implementation of circular economic models. Smart technology can also improve social welfare and create green jobs through new products and business models. To achieve this, a holistic approach that integrates technology, policy, and social values is essential. Governments, the private sector, and civil society must work together to ensure that development focuses not only on economic growth but also on environmental and social sustainability. A smart future must be based on sustainable economic development, grounded in the need to integrate technological innovation with environmental and social responsibility. A sustainable economy ensures that technological progress serves the needs of the present without compromising the ability of future generations to meet their own needs, thus preventing the climate crisis and social injustice.

Sustainable economic development based on smart technology innovation has transformative implications, significantly boosting economic efficiency, environmental sustainability, and social well-being, although it presents new challenges that require careful management, especially in countries with weak economies or developing countries. These implications include economic implications, namely increased efficiency and productivity, the creation of business and innovation opportunities, broader market access, and economic resilience. Meanwhile, environmental implications include natural resource conservation, climate change mitigation, and better environmental monitoring. Social implications include improved quality of life, new job creation, and financial inclusion. Overall, sustainable economic development based on smart technology innovation offers great potential for a more efficient, cleaner, and inclusive future, provided that the associated challenges are proactively managed through wise policies, cross-sector collaboration, and good intentions, so that a smart future can be achieved.

#### 4. CONCLUSION

Sustainable economic development relies heavily on smart technology innovation to boost productivity and efficiency while reducing environmental impact. Smart technology can improve social welfare and create green jobs through new products and business models, ultimately enabling a smart future. For Indonesia, the big question is whether it can capitalize on the momentum of global transformation to achieve its Golden Indonesia 2045 vision. With abundant natural resources and a vibrant, young population, Indonesia has great potential to become a developed nation. However, challenges such as corruption, social inequality, and environmental degradation need to be addressed urgently. The government, the private sector, and civil society must work together to ensure that development focuses not only on economic growth but also on environmental and social sustainability.

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