

Using Technologies and Artificial Intelligence to Make the World Sustainable and Leadership Improvement

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Abstract

The progress and technological development we have created through continuous learning throughout history will enable us to transform our way of life and adapt to modern sustainable development. By working together, we must ensure all the conditions so that AI can accelerate progress towards Sustainable Development Goals and help us achieve them by 2030. Through a coordinated international approach, we must establish rules, procedures and practices so that Artificial Intelligence evolves ethically and truthfully. It should focus on innovative strategies to improve all processes, including research, development, and innovation. A close partnership and interaction between man and advanced technology will allow us to maintain the balance of living on the Earth with a human focus to achieve its goals and needs. Using humanity's most influential technology solves problems and challenges, changes our lives, and leads us to new technological revolutions for sustainable development.

Keywords: Artificial Intelligence, sustainable development, the industrial revolution, advanced innovation, interaction, future leadership

INTRODUCTION

Technological change is fundamental to scientific and economic breakthroughs that significantly promote global sustainability efforts. Human activities are also increasingly affecting and shaping the biosphere and climate system. Artificial Intelligence (AI) and related technologies such as robotics, automation, and the Internet of Things will further increase society's capacity to detect, adapt and respond to climate and environmental change. Technologies such as Intelligence, robotics and automation will play a key role in increasing the capability to detect and adapt to climate and environmental changes to achieve Sustainable Development Goals (Galaz, Centeno, Callahan,

Causevic, Patterson, The head, Baum, Farber, Fischer, Garcia, McPhearson, Jimnez, King, Larcey, Levy, 2021)

Sustainable development has been defined in several ways, and the most frequently quoted definition is taken from the Brundtlands report. Sustainable development is, therefore, a development that meets the needs of the present without compromising the ability of future generations to meet their needs. Furthermore, sustainability is the foundation for today's leading global framework for international cooperation. The first conference on sustainable development was held in Stockholm in 1972, which focused on the link between environmental, economic and social issues through establishing the United Nations Environment Programme (International Institute for Sustainable Development, n.d.).

The Sustainable Development Goals were adopted as global goals by the United Nations in 2015 as a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030. Such activities are no poverty, no hunger, good health and well-being, quality education, gender equality, clean water and sanitation, affordable and clean energy, decent work and economic growth, industry and innovation and infrastructure, reduction of inequalities, sustainable cities and communities, responsible consumption and production, climate action, life underwater, life on land, peace and justice and strong institutions, Partnerships for Objectives (United Nations, n.d.).

Due to such diverse and broad-based objectives, AI has been integrated into Sustainable Development Goals in various forms, first through experiments and later in sustainable management and governance programmes. Smart AI intelligence management systems, replicate how people learn in an ever-changing environment that maximally empowers decisions with their presence. The authors emphasize that AI technologies will positively and negatively affect society. While people in advanced communities may fear losing their jobs to AI, in low-income countries, people may see AI as an opportunity to break poverty (Goralski, Tan, 2020).

Developing environmentally friendly AI is necessary to benefit current and future generations. Due to the growing development of AI, it is used wherever possible and will be a crucial part of environmental sustainability. The potential of AI will have a critical impact on world change, such as biodiversity, energy, water, transport, air, agriculture, and resilience to extreme events (Taherdust, 2023).

The European approach to AI trust will create a safe and innovation-friendly environment and propose three legal initiatives that will contribute to building trusted AI (European Commission, n.d.):

- European Legal Framework for AI to address fundamental rights and security risks specific to AI Systems
- A framework of targeted responsibility or adaptation of the rules and obligations of the digital age
- Revision of sectoral safety legislation such as the Machinery Regulation and the General Product Safety Directive.

The Commission aims to address the risks created by using AI through complementary, proportionate and flexible rules (European Commission, n.d.).

AI is an ally that sustainable development needs to more effectively plan and carry out activities related to the future of our planet and its sustainability. Technology such as AI will help us build more

efficiently, use resources more sustainably and reduce and manage the waste we generate more efficiently. Combining AI with sustainable development will allow all industries to create a better planet that addresses current needs without compromising future generations due to climate change or other challenges. In addition, AI can contribute to sustainable development through more efficient planning of Sustainable Development Goals (Sustainability for All, n.d.).

The research focuses on theoretical starting points and is based on a review of scientific literature on AI, sustainable development, leadership, the future, sustainable environment, industrial revolution, innovation, and their integration into society. A fundamental guiding principle of the research is the sustainable development of society through innovative sustainable leadership and education for the future of humanity, enabling the sustainable development of human society in the approaching technological singularity and upcoming super Intelligence. The compilation method summarised and cited the authors' theoretical starting points. The paper aims to demonstrate the impact of AI and sustainable development on society's understanding of humanity's future. The research seeks to highlight the importance of the effects of AI on sustainable development and the future of leadership for an advanced society, emphasizing that AI is a means, not a goal. The survey also identifies the importance of leadership in achieving Sustainable Development Goals and the implementation of the right policies of heads of state. The research aims to understand society's significance at the national level, reinforcing a sense of shared responsibility and realizing long-term sustainable development. The importance of knowledge planning for sustainable development means integrating knowledge and competencies into the planning process for sustainable development to conserve nature and the environment. Based on the literature, we asked two research questions:

- RV1: To what extent can AI and other advanced technologies affect sustainable development as the best human partner?
- RV2: How can leadership and education affect sustainable development and progress?

TECHNOLOGIES AND ARTIFICIAL INTELLIGENCE TO ACHIEVE THE GOALS OF SUSTAINABLE DEVELOPMENT

Chance (2018) states that we need the plan to navigate the economic singularity, which will require intellectual rigour and free creativity and imagination, so finding solutions to challenges should be a priority.

The World Economic Forum's Global AI Action Association brings together more than 100 companies, governments, international organizations, non-profit organizations and academics to maximize the social benefits of AI while reducing its risks. For example, American company Moderna was among the first to accelerate AI development and release an effective vaccine against Covid-19. Moderna also states that AI algorithms and robotic automation have helped them transition from manual production, significantly increasing the amount produced. AI thus helps us understand climate change, enables the transition to sustainable transport systems, and helps accelerate agricultural technology to eradicate poverty (World Economic Forum, 2022).

Mhlanga (2021) states in his article that AI significantly impacts achieving Sustainable Development Goals, particularly poverty reduction, improving infrastructure reliability such as transport and enabling economic growth and development in emerging economies. AI enormously contributes to education and the financial sector, so governments in emerging economies must invest more resources. In doing so,

they are researching this area to achieve the Sustainable Development Goals linked to innovation, infrastructure development, poverty reduction, promotion of agricultural education and the financial sector through financial inclusion.

The inevitable risk of facing catastrophic consequences, such as biodiversity collapse, has triggered some global initiatives to slow down or reverse existing growth processes. In 2015, the United Nations annexed a universal, legally binding agreement on climate change, the Paris Agreement on climate change. The use of digital technologies and innovation can be a significant help in reducing impacts. Among innovative technologies, AI is considered the most promising as it is used across a broader spectrum of areas for resolution in the public and private sectors. AI can monitor various aspects of land-based life, land use changes, food and nutrition safety, noise levels, weather stress, diseases, and epidemic outbreaks. The green AI approach is to address environmental sustainability challenges. It can empower intelligent, sustainable and innovative urban transformation for most human activities that generate negative environmental externalities (Yigitcanlar, 2021).

Environmentalists and academics warn that innovation in surrounding technologies is one effective way to reduce carbon dioxide. Therefore, governments and companies worldwide have invested in research and development to develop new, clean technologies or improve existing technologies that can drastically alter the links between energy consumption and the ecosystem (Xin, Ahmad, Lei, Khattak, 2021). However, the authors also say that by reducing innovation in the United States, environmental-related technologies are increasing the presence of carbon dioxide emissions.

Zhao, Wang and Dong (2023) note that China's innovative cities, like the spatial effects of innovation, help accelerate the aggregation of innovation factors and rely more on knowledge, science and technology than traditional energy. According to the Global Innovation Index, published by the World Intellectual Property Organization, it is among the world's 100 best scientific technology clusters, ranked second in the Shenzhen Scientific and Technological Cluster – Hong Kong – Guengzhou (GII, 2020). The importance of cities for innovation drives cooperation between industry, university, and research, creating knowledge and the flow of human resources within entities and regions. By strengthening the innovation capacity of universities and research institutes, breakthroughs in technology in the energy field can improve the efficiency of the exploitation and exploration of renewable energy sources and clean energy, further encouraging cities to rely on knowledge, science, and technology to realize development.

An essential theme is whether AI can sustainably create value for a company's growth. Every responsible leader must keep the company competitive in a world heavily driven by technology. More and more plans are being made to change how we work and how it will significantly impact all business areas. While most companies are still working the digital transformation, they slowly realize that their AI transformation is no longer a futuristic concept but the next challenge they will face. This unique approach has led us to consider how technology can create added value at an ethical and social level to create sustainable value (Pagani and Champion, 2021).

Isense, Griese and Teuteberg (2021) state that with highly developed algorithms, AI has gained significant importance as a built-in element of digital systems and changed the functioning of many business models. The growing importance of AI is also evident in knowledge management systems for sustainable business models in terms of simplifying human decision-making and planning human-

machine interactions. Sustainable AI can be defined as the system's ability to correctly interpret, learn from, and use external data to achieve specific, tailored objectives and tasks.

The dynamic development of technologies during the Fourth Industrial Revolution led to the dehumanization of industry, resilience and endurance. The authors (Grabowska, Saniuk, Gajdzik, 2023) point out that they are concerned about workers, society and even governments due to the rapid rise in the introduction of technologies, so it is necessary to include a critical human role in the assumptions of future industrial development. The Fifth Industrial Revolution concept involves the human factor's return to the industry through collaboration and interaction between man and intelligent production systems, combining speed and precision and providing automation with human cognitive abilities and critical thinking (Grabowska, Saniuk, Gajdzik, 2023).

Europe has become a global hub for trusted AI, ensuring the security of people and businesses. High-risk AI systems must meet strict criteria before being put into service. Europe strives for excellence in AI, and coordination will further strengthen Europe's leading position in AI, which will be humanely centrist, sustainable, safe, inclusive, and trustworthy. Innovating in developing and using AI technology will ensure global competitiveness in all sectors and countries (European Commission, 2021).

KNOWLEDGE PLANNING FOR SUSTAINABILITY DEVELOPMENT OF ARTIFICIAL INTELLIGENCE

The question that young people and their parents are asking themselves is how best to prepare for the future. First, the obvious answer is to study computer science and technology, as they are at the heart of all the changes and cover the world of the information revolution, so it will be increasingly important to understand how they work (Chance, 2018).

AI's emergence in all forms of technologies in our daily lives has also led to incorporating AI into curricula to prepare schoolchildren to learn about these newly emerging advanced technologies. However, a significant gap has occurred in including prospective teachers in the curriculum to improve curriculum theories and teacher development. Incorporating AI topics into school learning plans is an important global strategic initiative in next-generation education that helps understand and inspire future AI researchers, ethical designers and software developers. Therefore, China and the United States have jointly announced relevant AI educational initiatives (Chiu, Chai, 2020).

Miao and Holmes (2020) state in the UNESCO report that AI will change the teacher's role by taking over most knowledge-based teaching and assessment so that teachers are more focused on the social aspects of education. AI is becoming a catalyst for education reform, allowing for a greater emphasis on project-based, adaptive, collaborative, and only-regulated learning. The main obstacle to the widespread use of AI technologies is the lack of reliable evidence of their effectiveness.

Gallagher and Mohamed (2019) stress that to contribute effectively to the 21st-century knowledge economy, principles and policies of sustainable development, curricula should use AI applications to increase the potential for transformation in educational practices. The action model calls on education leaders to abandon consumables and adopt innovative technologies and applications that radically change current and future learning practices allowing individualization and uniqueness. In addition, schools need teachers who teach and encourage action in a collaborative learning environment, which

means they need to communicate with all parties, science, employers, and parents and involve them in intelligent decision-making.

In the era of the Fourth Industrial Revolution, the educational path, we have to rearrange the optimal level of learning, education, and balance of results to industrial orientation. We have to create sustainable education for the future, which includes zero energy, infrastructure, intelligent energy use and environmentally friendly sources of green curriculum and take them in the light of the concept of green sustainability. Green education is not only introducing and placing environmental ethics, norms and values into the learning plans but new lasting progress and prosperity achieved through innovative technology (Pal, Bhattacharya, Mustafi, Mitra, 2023). Governments, policymakers, private sectors and public-private partnerships have launched national strategic initiatives to strengthen the introduction of the Fourth Industrial Revolution (Bongomin, Nganyi, Abswaidi, Hitiyise, Tumusiime, 2020).

Holmes, Peresson, Chounta, Wasson and Dimitrov (2022) state that before AI tools are put into service in education, it is necessary to ensure the democratic rights of parents, which include human rights and the need for curricula to address the human and technological dimensions of AI literacy.

The dilemma of the plan's ethics in developing and using AI tools in educational contexts must also be resolved. It is necessary to ensure that data and intellectual property rights remain expressly with the pupil. We must highlight the need to use and teach AI in education and prioritize human rights, democracy and the rule of law (Holmes, Peresson, Chounta, Wasson, Dimitrov, 2022).

Chance (2018) surprisingly lists how many people think education is the answer to modern technologies, including AI, as learning about using big data will improve learning ability. Furthermore, the author argues that companies and states could spend money on keeping jobs to educate children and adults for future employment.

In the report, Unesco (2020) states that transformation cannot be done without adequate physical infrastructure. Pupils need skills to develop AI and abilities to work with AI, so the traditional view of teachers as knowledge carriers are changing. Education ministers must provide overhauls on curriculums from primary school to university. It must empower students with information awareness, computer thinking and digital learning and higher order competencies than those critically thought, courage to explore and innovate, and the ability to reflect, introspection and ethical standards.

GLOBAL SUSTAINABLE DEVELOPMENT LEADERSHIP

For the way and trends of life we have now, we will need 2.9 planets of Earth in 2050 to meet our need for resources to survive. Therefore, it is necessary to create new business models and management models for sustainability that can address the economic, social and environmental pillars of sustainability. These models allow for the balance of local responsiveness with global integration to effectively promote the company's performance and to address the growing demands for sustainable solutions for socially and environmentally focused stakeholders. Furthermore, a new model of global leadership for sustainable capability is needed for transformation and sustainable development. Leaders need to take on several roles, leaders as trustees, citizens, visionaries, ethical role models, experts and mentors, moderators, inspiration for change, responsible managers, and managers of relations with different stakeholders (Fry and Egel, 2021).

Trent Lessar (Forbes, 2022), Chief Executive officer of a renewable energy company, said that sustainable leaders have four common features: a long-term vision, they think beyond the election cycle, they are focused on creating a better future for all, working together, being innovative, brave, and willing to take risks and stand up for what they believe in. He also states that sustainability is about reaping the benefits of renewable energy and helping customers understand choices.

According to the U.S. National Centers for Environmental Information, there was \$ 306.2 billion in damage in 2017 due to climate change and extreme weather. Therefore, climate change requires excellent attention from the leadership of organizations to the local and global environment, and sustainable governance has emerged as an effective leadership style to meet sustainable challenges. In addition, sustainable government plays a vital role in organizational learning, which promotes active employee participation, quality of service, market orientation, innovation, and affiliation (Lqbal, Ahmad and Halim, 2020).

Company 5.0, which originated in Japan, is a super-intelligent company based on a platform of advanced services and aims to create a society where people enjoy life as much as possible. Company 5.0 seeks to create a cyber-physical community in which everyday life will be improved by increasingly working closely with intelligent systems that form a super-smart cyber-physical system. Company 5.0 technological focus includes cybersecurity, cloud computing, large data databases, AI, competent services and smart cities (Bongomin, Nganyi, Abswaidi, Hitiyse and Tumusiime, 2020).

The world needs effective governance for sustainable development. This leadership requires an internal process with a responsible worldview to work effectively with others in creating through a move. Effective governance means prudent design and implementation of public policy and good provision of public services, so innovative governance and governance will be essential for organizations in all sectors (International Institute for Sustainable Development, n.d.).

The various social issues accompanying economic development pose new challenges to leaders integrating economic benefits, social responsibility and environmental protection. Sustainable governance represents a key role for leaders in achieving the sustainable goals of the economy, society and the environment. It has become an essential part of research into governance theory in recent years. Close links between organizations and the sustainable development of the social economy can be achieved when companies fully embrace the challenges of sustainable development and take it as an opportunity for business development and change their models. To implement the highest possible level of sustainable governance, companies must be highly successful, creating long-term value for all stakeholders. Sustainable leadership positively impacts employees' organizational dedication, satisfaction at work, and confidence (Liao, 2023). To develop leadership, we have to increase the effectiveness of leadership performance. It is essential to focus on individual managers and how they should contribute and improve practical individual and organizational performance through tailored practices that will represent the development needs of managers aligned with management roles and organizational structures. The development of leadership is an own development, and the way of understanding consists primarily of one's perspective, based on one's own experience and is an essential method of conceptualization in which the first step is to manage oneself and focus on your work before realizing leadership identity (Kjellstrom, Permanent, Tornblom, 2020).

DISCUSSION OF RESEARCH ISSUES

Our question RQ1 was: To what extent can AI and other advanced technologies affect sustainable development as a man's best partner? AI and other advanced technologies will be an increasingly essential partners for humans with a strong influence on everyday life. (Galaz etc., 2021) believe that AI will play a key role in increasing climate and environmental change capacity to achieve Sustainable Development Goals. AI must benefit people, groups, businesses, and countries together to help solve problems and meet future challenges. Goralski and Tan (2020) state that AI will significantly help break down poverty in low-income countries. AI is cleverly integrated into everything in our life, such as preparing breakfast, doing hobbies, sleeping on vacation or in the car in such a way that we do not even notice the constant connection with AI. It becomes less and less disruptive with the emitting of the human mind. The potential of AI will also have a crucial impact on world changes such as biodiversity, energy, water, transport, air, agriculture, and resilience to extreme events (Taherdust, 2023). Thus, AI will help to formulate and plan key sustainable policies and implement its legislation. AI will use its influence to help with more efficient planning and activities related to the future of our planet and its sustainability (Sustainability for All, n.d.).

On other issues, we are interested in how leadership and education can influence sustainable development and progress. When it comes to sustainable leadership, we touch not only on the area of the surrounding point of view, but social, economic, and personal areas are also important. Trent Lessar (Forbes, 2022), chief executive of a renewable energy company, said sustainable leaders should focus primarily on planning and creating a better future for all. Leadership and education not only play a key role in sustainable development and progress but also in the personal development of new leadership skills, lifelong learning, and the development of new priority competencies that will be needed for modern managers of the future. Lqbal, Ahmad and Halim (2020) argue that sustainable governance is vital in organizational learning. From an economic view, sustainable leadership is essential to businesses' growth, productivity, transformation, and digitization. The International Institute for Sustainable Development (n.d.) warns that the world needs effective leadership for sustainable development, which must have a responsible worldview. Therefore, the social aspect of the social aspect, such as the need for new education, the development of new talent and advanced competencies, diversity, integrity, and the preservation of best practices, is also crucial. Liao (2023) states that sustainable management positively impacts employees' organizational dedication, job satisfaction, and confidence. Therefore, planning knowledge and education plays an essential role in effective leadership. Gallagher and Mohamed (2019) stress that to contribute effectively to the 21st-century knowledge economy, the principles and orientations of sustainable development and curricula systems must be. The concept of knowledge planning relates in particular to the planning, organization and implementation of education on sustainable solutions with a focus on research and innovation. Pal, Bhattacharya, Mustafi and Mitra (2023) state that education and balance of results tend to be industrial orientation, how to create sustainable education for the future.

CONCLUSION

We urgently need change for our envisioned future and must ensure the right to education and the conditions and responsibilities. An advanced and effective education needs transformation and radical change at all levels to achieve the constantly changing goals of sustainable development of the planet and humanity. Society must be based on the cohesion and solidarity between people, the natural environment, and the rest of us, with fundamental freedoms and rights for all. That includes peace,

inclusion, justice, interconnectedness and independence without compromising coexistence between humans and the natural environment and AI systems exploiting potential should be promoted throughout the life cycle of AI systems and freedom without compromising coexistence between humans and natural environment and AI systems and using its potential to the greatest extent possible.

Leadership is vital in promoting sustainable development at organizational and social levels. The definition of sustainable development means that we guarantee and meet the needs of current generations to ensure the life and residence of ages in the future, where it puts man first in the circle of social norms. But in reality, the process is much more complex and multi-layered. If we want to deepen further and accelerate efforts for sustainable development, how we work and use free time will need to be significantly more focused on sustainability goals with a constant awareness of the future of life and existence. The end requires courageous, creative, ethical, innovative leaders who are empowered by knowledge and, with their example, strengthen and inspire the organization.

A New, sustainably responsible social order should be aimed at balancing a shared society that includes living beings, the environment, and other stakeholders. AI and other advanced technologies must be a means of achieving all those strongly intertwined goals. Man has created AI and technology through industrial and technological revolutions, so it needs to be nurtured to learn from all sorts of databases. We must therefore create appropriate databases that include positive attitudes and coexistence for all, based on values for the benefit of both the individual and society.

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