THE ROLE OF AI IN TRANSFORMING GLOBAL DEVELOPMENT AND SOCIETY

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Technological trends drive change and innovation, shaping how we live, work, and communicate. Artificial intelligence (AI) stands out by transforming society, enhancing work, learning, and daily life. Its adoption across sectors improves efficiency, personalizes processes, and expands resource access. While developed countries rapidly adopt AI technologies, less developed nations face challenges like infrastructure gaps, limited resources, and digital illiteracy, creating a significant development gap. This paper explores AI potential by comparing practices between developed and less developed countries, aiming to identify best practices for inclusive technology application. Special attention is given to the importance of understanding AI's impact on society's future. The paper emphasizes that AI integration is not just a technological challenge but a social responsibility, as it can reduce global inequalities and improve quality of life. Recommendations for strategic AI implementation are provided to minimize risks and negative consequences from improper application and regulation.

1   Introduction

Artificial Intelligence (AI) represents one of the most revolutionary technologies of our time, with the capability to transform global social and economic dynamics. It is not limited to computer sciences but encompasses fields such as healthcare, security, education, arts, and business. Its exponential growth in interest has led to significant research into its impact on society, including technological, legal, and ethical aspects.

The rapid development of AI technologies and their integration into daily processes have transformed the ways we produce, communicate, and innovate. However, this transformation is neither universally accessible nor equally beneficial for all regions of the world. Thus, this paper focuses on the potential and importance of AI for the future of society.

Although there are fears about the societal impact of AI, these concerns should encourage the development of a systematic framework that supports sustainable AI growth rather than hinders it. It is crucial to distinguish science fiction from practical reality and ensure sustainable funding and responsible investment. In doing so, AI has the potential to transform the future of society, the economy, and daily life (Kayid, 2020).

2   Creation and evolution of AI

Over the past 20 years, AI has become a topic of global significance, with its applications increasingly surpassing expectations. In this context, various definitions and interpretations of the term exist. However, as Kayid (2020) states, Alan Turing is considered the pioneer of AI with his question, "Can machines think?" and the development of the Turing Test in 1950, which assesses a machine's ability to mimic human intelligence. The term "artificial intelligence" was first used by John McCarthy, associating it with "symbolic artificial intelligence," which remained dominant until the late 1980s (Kayid, 2020).

According to Kayid (2020), AI represents the science and engineering of developing intelligent machines capable of understanding and replicating intelligent behavior. Furthermore, Kayid notes that AI encompasses tools and techniques such as neural networks, genetic algorithms, symbolic intelligence, and deep learning, all of which

have seen exponential growth and impact fields such as healthcare, space exploration, robotics, and the military.

On the other hand, Lu (2019) emphasizes that AI includes methods enabling computers to analyze and simulate human thought processes, performing tasks previously reserved for humans. After 60 years of development, AI has evolved into a multidisciplinary science, now evident in its industrialization and commercialization through emerging trends (Lu, 2019):

- Deep learning and big data – Artificial neural networks enable robots to solve complex tasks;
- Industrial applications – AI is used in image recognition, speech recognition, NLP, and predictive analytics;
- Expanding applications – From services and commerce, AI is spreading to manufacturing and agriculture, standing out as a general and fundamental technology.
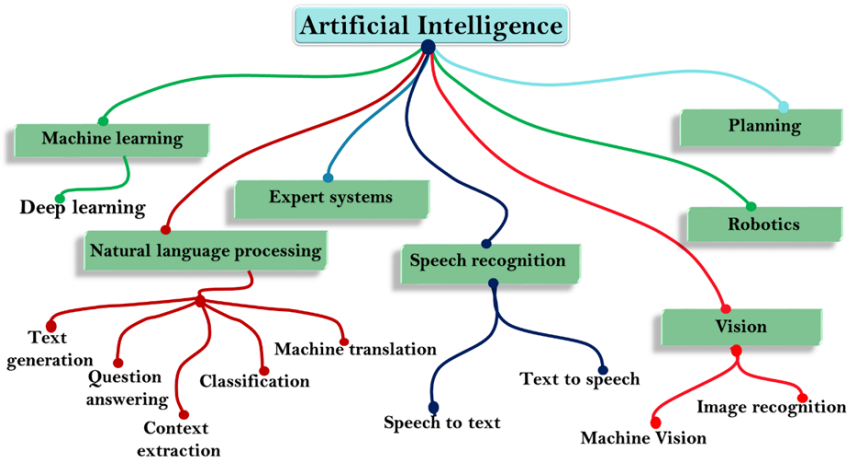
The next image shows the subfields of AI.

Figure 1: Subfields of Artificial intelligence
Source: Kayid, 2020

The development of AI did not occur in all subsectors at once, so if we look at its progression over time, it unfolded as follows (Lu, 2019):

- Initial Phase (1956–1980): AI was used to solve mathematical problems, prove theorems, and learn languages. A key event was the 1956 Dartmouth Conference, where scientists like McCarthy and Minsky laid the foundations for AI;
- Industrialization Phase (1980–2000): In this phase, the focus shifted to "knowledge processing." The Japanese government launched the Fifth Generation Computer Program, supported by other developed countries, with the goal of developing technologies like image recognition, translation, and human-machine dialogue;
- Explosion Phase (2000–present): This phase began with significant achievements, such as IBM's Deep Blue defeating Kasparov and Google's AlphaGo defeating Lee Sedol. The development of the internet, big data, and GPUs enabled the widespread application of AI in everyday life. The period from 2010 to 2012 was crucial for the development of deep learning, marked by exponential growth in computing power and advancements in distributed computing theory.

3   The Impact of AI on Business and Technological Advancement

Many authors have explored the impact of AI on innovation. For example, Allam (2016) emphasizes that AI has enormous potential to transform innovation, particularly in situations where traditional innovation management methods are limited. AI allows for faster and more efficient data processing, uncovers new opportunities, and helps overcome innovation challenges. He recommends that organizations implement AI into their innovation strategies to gain competitive advantages, accelerate innovation processes, and improve customer experiences. Allam (2016) also discusses AI's significant potential to accelerate innovation and change the way products and services are designed, but notes that companies must radically alter their approach to innovation to fully leverage the benefits AI offers.

Bahoo et al. (2022) in their study highlight the crucial role of AI in corporate innovation. In their conclusion, they provide recommendations for companies on how to integrate AI into their business strategies, particularly in the context of

business models and production. They suggest that all companies, regardless of size, consider adopting AI, while advising industrial manufacturing companies to encourage the use of AI technologies to gain a competitive edge, including the establishment of a specialized department for AI management.

Gama & Magistretti (2023) explore the role of AI in innovation and its impact on organizations and industries. They note that AI is regarded as a key technology that not only enhances an organization's internal capabilities but also supports decision-making, product and service development, and innovation processes. They recognize AI as a crucial technology for innovation across various industries and applications but also highlight that its implementation requires new competencies and the ability to interpret data effectively.

While Lu (2019) points out that future artificial intelligence will have the ability to adapt to humans through language, gestures, and emotions, and that people will live simultaneously in both physical and digital spaces, Kayid (2020) underscores that the advancements in AI provoke both excitement and concern about its potential to surpass human abilities in many areas.

Heng et al. (2022) mention that, despite the different definitions, terminologies, and techniques, the contribution of AI to improving individual well-being is recognized. They also predict that AI-based technologies will drive economic stimulus in the world's largest industrialized economies in the foreseeable future.

4 AI and global development

Achievements in AI and the popularity of various tools are not equally distributed. They are particularly not accessible in developing countries, where limited access to cutting-edge technologies and inadequate infrastructure present significant challenges.

According to research by PwC, the potential of artificial intelligence could increase global GDP by $15.7 trillion by 2030, highlighting its importance for global economic growth. However, the benefits of AI technologies are primarily concentrated in developed countries, while developing nations lag behind due to limited access to modern technologies and infrastructure. This creates a significant

gap in the ability to utilize AI tools and potential economic benefits (Mannuru et al., 2023).

The study by Mannuru et al. (2023) investigated the impact of generative AI technologies on developing countries, analyzing both the positive and negative effects across various domains. The aim was to identify the opportunities and challenges that generative AI brings to these nations, with a focus on employment and industrial growth, which will be discussed in the following section.

4.1   Impact on Employment

Speaking of the positive impacts, it is noted that generative AI has the potential to transform the labor market in developing countries through (Mannuru et al., 2023):

- Overcoming language barriers, which helps in translation and language education;
- Development of technological skills and improvement of employees' digital literacy;
- Increasing employer efficiency by automating routine tasks;
- Providing accessible training for skill development;
- Creating new job positions related to AI work, such as prompt engineering.

However, generative AI can also have negative impacts on employment, including (Mannuru et al., 2023):

- Automation of administrative tasks, such as data entry and customer support;
- Reduced demand for certain skilled jobs, such as programming;
- Loss of opportunities for artists and creative professionals due to automation.

4.2   Impact on Industrial Growth

Speaking of the positive effects of generative AI on industrial development, the following points are mentioned (Mannuru et al., 2023):

- Increased efficiency: Automation saves time and resources;
- Improved productivity: Employees can focus on more creative and complex tasks;
- Better decision-making: Analyzing large datasets enables more precise strategic decisions, especially in product development and marketing;
- Encouraging innovation: Enables the creation of new products and services that were previously not feasible;
- Enhanced customer experience: Personalized interactions with clients and the application of technologies like facial recognition and telemedicine.

However, generative AI also brings risks, which include (Mannuru et al., 2023):

- Overreliance on AI: This can weaken a company's ability to make decisions without the aid of technology;
- Bias and discrimination: AI models can reproduce existing biases from the data they were trained on;
- Security challenges: Vulnerabilities in AI systems can lead to the theft of sensitive data;
- Job loss: Automation may render certain professions obsolete;
- Ethical concerns: The generation of inappropriate content, such as fake news or deepfake materials, can negatively impact society.

The study concludes that developing countries have the opportunity to leverage the potential of generative AI, but careful consideration of the challenges is necessary to ensure balanced and sustainable growth.

5   Risk and the future of AI

AI and discussions about its potential applications have become a topic of polarized debates about the future, encompassing a wide range of utopian and dystopian fantasies (Arora et al., 2023). In their paper, Arora and colleagues (2023) focus on the ambiguity of risks associated with the potential benefits and potential harms linked to the future of AI.

Bailey et al. (2022) argue that it is crucial to develop our understanding of AI as a new technology, whose uses and effects are still not clearly defined and are yet to stabilize into recognizable patterns.

Arora et al. (2023) place special emphasis on algorithmic bias, which is a direct function of the quality of the data used to train AI algorithms. This bias is effective only for those populations for which training data is available. They also introduce the concept of "data colonialism," linked to the term "Global South," where clean data and the development of algorithms are refined for the benefit of those in the Global North who use these algorithms.

Heng et al. (2022) define the Global South (GS) as "a group of countries that are rapidly adjusting to the industrialization of their economies". These are countries trying to leverage the growing demand for innovative products and services to negotiate the adoption of new technologies like AI, which can help them further stimulate economic growth and become influential in shaping policies that could improve global development. However, the same authors also point out that poorly directed AI adoption strategies pose the risk of neglecting the social, economic, and cultural needs of these countries, which could ultimately lead to the implementation of technologies that do not meet the needs of their users.

In this regard, Arora et al. (2023) propose a relational approach to risk, which should be useful for policymakers in developing new AI laws, taking into account technological changes and development in line with the digital maturity of each country and region. Policies should address the rights and ethics not only of AI users but also of those developing these technologies, particularly marginalized groups, since data colonialism contributes to inequalities. This approach would help in understanding the complex interdependencies between risks and policies, as well as differences in AI regulation across regions, which would enhance global cooperation. Furthermore, an effective approach to ethics requires multidisciplinary collaboration among all key stakeholders, including innovators, policymakers, and the public. It is also emphasized that it is important to prevent marginalized populations from being excluded from AI innovations, ensuring their inclusion in development, not just the distribution of technology (Arora et al., 2023).

In this context, Heng et al. (2022) conducted a study aimed at providing guidelines on how to conduct a comprehensive analysis of the AI ecosystem in Global South countries, to assess their readiness to adopt and effectively use these technologies. For this analysis, they conducted a qualitative case study of two Global South countries, Senegal and Cambodia.

The examination of the AI ecosystems in these countries revealed the need to stimulate their societies (e.g., through media exposure, education, etc.) to recognize the practical effects of AI. Additionally, they emphasized that successful AI implementation requires mutual fulfillment of the needs of the various stakeholders involved in the process. Aderibigbe et al. (2023) highlight that key actors, including governments, companies, and educational institutions, must work together to improve infrastructure, education, and skills, while public-private partnerships play a crucial role in creating a conducive ecosystem for AI implementation.

The authors Heng et al. (2022) provided specific recommendations at the level of academic, industrial, and government institutions in these countries, suggesting that they focus on better directing their resources to energize (and optimally allocate) their research and entrepreneurial capacities. These efforts could help identify ways in which AI solutions can add value within these countries. Aderibigbe et al. (2023) also emphasized that it is essential for actors to proactively leverage the opportunities that AI provides. This includes using AI for sustainable agriculture, improving healthcare accessibility, and encouraging innovative approaches to education. They also note that the challenges and opportunities of AI in developing countries transcend national borders and that global collaboration is crucial for sharing knowledge, best practices, and resources.

International organizations, technology companies, and research institutions can play a pivotal role in supporting developing countries on their AI implementation journey. Therefore, the integration of AI in developing countries is a dynamic process that requires joint efforts, strategic planning, and a commitment to inclusivity. The potential benefits are enormous, and by collectively addressing the challenges, key stakeholders can pave the way to a future where AI serves as a catalyst for sustainable development, leaving no one behind (Aderibigbe et al., 2023).

6   Conclusion

The ability of AI to automate processes, reduce costs, and increase efficiency brings significant changes and has become a key driver of innovation. In the healthcare sector, it enhances diagnostics, enables precision medicine, and optimizes healthcare services, particularly in rural and remote areas. Its application in sustainable development helps address global challenges such as climate change, agricultural production, and resource management. Smart cities utilize AI to optimize traffic, improve energy efficiency, and enhance the quality of life, demonstrating how technology can contribute to sustainable solutions. Simultaneously, AI enables personalized education and workforce reskilling, offering new opportunities for learning and professional development. In this regard, AI plays a crucial role in transforming global development and society, shaping the aforementioned and many other sectors.

However, the use of AI carries significant risks. Inadequate implementation can deepen social inequalities between wealthy and impoverished regions. While automation creates new jobs, it also threatens traditional industries, leading to economic insecurity and increased unemployment in certain sectors. Ethics and privacy emerge as critical challenges in the AI era, as it is essential to protect user data, prevent discrimination, and ensure the fair application of technology.

While developed countries rapidly adopt these technologies, less developed nations face challenges such as a lack of infrastructure, resources, and digital skills, exacerbating global inequalities.

Key challenges faced by AI communities in Serbia, Croatia, Montenegro, and North Macedonia in fostering collaboration often stem from differences in regulatory frameworks and approaches to innovation. Each of these countries has specific legal regulations regarding AI, data protection, and ethical standards, complicating the harmonization of legal aspects of cooperation. Additionally, the approach to innovation and the level of support provided by governments to AI sectors vary significantly, resulting in different paces of development and implementation of new technologies. The lack of uniform financial incentives and investment opportunities also represents a barrier to more effective regional collaboration. Despite these

challenges, there is strong motivation to strengthen joint initiatives, with a need to align legal norms and promote transnational AI projects[1].

To overcome the challenges faced by less developed countries, Serbia is making significant efforts in the development of AI, as reflected in the adoption of the Artificial Intelligence Development Strategy for the period 2025–2030. With this strategy, Serbia became the first country in the Southeast European region to take a significant step in managing AI development, positioning itself as a regional leader. This achievement has also been recognized through Serbia's presidency of the Global Partnership on Artificial Intelligence (GPAI)[2].

In the future, the focus must be on the sustainable and inclusive application of AI, as it can become a tool for societal progress only if developed in alignment with global standards and ethical guidelines. It is crucial to ensure equitable access to technologies and guarantee that all segments of the population benefit from their advantages. Global collaboration in the development and regulation of AI is essential for minimizing risks and negative consequences while maximizing its potential to improve quality of life and reduce social inequalities. AI is not merely a technological challenge but also an opportunity for social responsibility, capable of shaping a fairer and more prosperous future.

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