The Driving Impact of Artificial Intelligence on Global Expansion

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Abstract

The invention and continual growth of artificial intelligence (AI) on the global stage have significantly shaped the world's economies, governments, societies and their cultures. The new industrial revolution and the subsequent race of the world's leading powers have led to increased international joint efforts and exchange of information, simultaneously reducing barriers to trade and communication. Meanwhile, emerging technologies deploying AI have led to changes in human behavior and culture and challenged the traditional nation-state model. Although several implications of the proliferation of AI remain unknown, its widening application may be tied with accelerating globalization, referred to interchangeably as global expansion. This proposal will further investigate and support how the development of artificial intelligence is propelling globalization, challenging dissenting theories.

Contents

The Driving Impact of Artificial Intelligence on Global Expansion

Life in the 21st century has been depicted as fast-paced, information-oriented, and filled with opportunities for invention, progress, and creativity. Sectors such as healthcare, education, engineering, IT, and communications, among others, have undergone vast technological transformations. In parallel, the past two decades marked the invention and global proliferation of artificial intelligence (AI). Machines and software operated in virtually every part of the world often rely on algorithms and datasets undergoing constant improvement by AI systems, with little human intervention.

The opportunities derived from the invention of AI continue to be leveraged across a growing array of fields and sectors, yielding new industrial solutions and facilitating individuals' lives. Latest digital adoption enabled for more robust production and supply, spurred intergovernmental initiatives and cooperation, but most notably, transformed the public sector. Transitions in healthcare, education, engineering, IT, and communications are just a few examples of technological expansion, with AI at its center. Societies, governments, and economies continue to be impacted by newest solutions, including machine learning and algorithm writing, virtual reality, AI-powered robotics, advanced interfaces, and autonomous systems.[1]

Due to the technology gap, however, there are still unknown consequences of the use of AI on the mass scale. Although the applications of AI and its benefits to both science and humanities are well stated and explained in the latest research, little focus has been given to the tie between AI and globalization, the process of global expansion and merging of cultures,

[1] Michael Cheng-Tek Tai, "The Impact of Artificial Intelligence on Human Society and Bioethics," *Tzu Chi Medical Journal* 32, no. 4 (October 2020): 339-341.

economies, and political institutions. The performance of AI is of a catalytic nature; by transforming and refining certain industries and areas of human life, it also connects individuals, often fusing their practices, beliefs and life objectives. The majority of these influences, if not all, coincide with the trend of globalization. It may be argued, drawing on data analysis and assessment of major world's events, that it is AI embedded in machines and digital technology that plays the role of one of the main drivers of globalization.

Globalization

The nature of relations and the degree of cooperation between the world's nations has been fluctuating since the rise of nation-states. In the early years, societies and their governments were frequently characterized by individualism, and even isolationism, a policy of refraining from involvement in international political and economic affairs, as well as from forming alliances with foreign nations.[2] The development of the countries was primarily sought in the local production, militarization within borders, and rather limited flow of migrants between individual states. Volatility in the global market, the growing importance of importing and exporting raw materials and industrial goods, and increasing migration, changed the course of history and eventually took the trajectory that prevails to this day. Particularly in the waning years of the 20th century, following the conclusion of the Cold War and the ensuing unipolarity between states, there was a visible trend toward closer cooperation on security, trade, and human

[2] Robert Urbatsch, "Isolationism and Domestic Politics," *The Journal of Conflict Resolution* 54, no. 3 (June 2010): 471-472.

rights protection.[3] This tightening of international relations, rapidly accelerating in the 21st century may be referred to as globalization.

As a result of global expansion, the world has begun to act as a benchmark in lieu of societies. The nation-state order, particularly observed among the Great Powers, has been shifting to the world order with shared values, laws, and institutions. Meanwhile, established countries are vying to shape global culture and trends in alignment with their interests. The process of reconciling differing national interests, including capital flow, border security, along with the legal and social norms, is the very process of globalization.[4] Often, however, globalization is perceived solely in a political or economic context, while other aspects tend to be overlooked.

Yvon Pesqueux offers a six-dimensional analysis of the process. The posited political perspective considers the growing weight of supranational institutions and transnational political issues deflating the nation-state model and local policymaking. The economic perspective references the increased activity and consequences of multinational corporations. In addition, Pesqueux's geographic sense considers the shared access to global resources, ebbing the frontiers of individual nations. The dogmatic sense focuses on the more negative, if not fatalistic ideology, according to which the dissemination of national values around the world and the external constraint of citizens' choices and priorities are inevitable.[5] André Bellon implies a similar

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[3] Norrin M. Ripsman, "Globalization, Deglobalization and Great Power Politics," *International Affairs (London)* 97, no. 5 (September 2021): 1318.

[4] Tuo Cai and Zhenye Liu, *Global Studies: Volume 1, Globalization and Globality*. 1st ed. (Abingdon, Oxon; New York, NY: Routledge, 2020): 25-26.

[5] Yvon Pesqueux, "What is Globalization? The Paradoxes of the Economic and Political Substance of Markets," *South Asian Journal of Business and Management Cases* 2, no. 1 (June 2013): 4-5.

philosophy, adding that it is inventions and technological advances that will ultimately bring about the finiteness of the world.[6] The historical perspective depicts globalization as a post-colonial process of overlapping the geographic space of markets and that of nations. The final, organizational perspective is a reinterpretation of Marxist collectivism and his theory of the development of the factory, envisioned as bringing together employees who were previously individual home workers.[7]

Artificial Intelligence

AI Definition and Its Properties

The term *artificial intelligence* refers to computer systems that perform assignments which require a certain level of intelligence among humans.[8] The National Artificial Intelligence Act Of 2020 defines *artificial intelligence* as "a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations or decisions influencing real or virtual environments."[9] In the most simplistic sense, AI is the aptitude and capabilities of machines and software, distinct from the intelligence of humans or other animals.[10] "AI does not describe a single technology. It is an umbrella term to describe a range of technologies and

[6] André Bellon, "God Created Globalization…" *Le Monde Diplomatique*, November, 2004, https://www.monde-diplomatique.fr/2004/11/BELLON/11694.

[7] Pesqueux, "What is Globalization?" 4-5.

[8] European Parliament Policy Department for Economic, Scientific and Quality of Life Policies, *Opportunities of Artificial Intelligence*, by James Eager et al. (Bruxelles: European Union, 2020), 15.

[9] US Department of State, *Artificial Intelligence (AI)*, Policy Issues Publication (Washington, DC, n.d.), https://www.state.gov/artificial-intelligence/.

[10] Christoph Bartneck et al., *An Introduction to Ethics in Robotics and AI*. 1st ed. (Cham: Springer, 2021), 8.

methods, such as machine learning, natural language processing, data mining, neural networks or an algorithm."[11]

The search for and eventual invention of AI was the result of a quest to maximize human capabilities and development by increasing efficiency and conserving time on the most complex tasks. In the early stages of digital technology development, scientists recognized that some operations and calculations could be bypassed by implementing a robust algorithm. Thus, technological advances would accelerate more than ever, because at any point in time progress had been saved and actions up to that point could be repeated infinitely. In fact, the dream of "living systems" that would run and unite the world's technical development began with the invention of the first programming language in the early 19th century.[12] Given that it was viable to find a set of commands and rules that people use to delegate tasks to machines, there was the hope of developing software that would also learn and refine the built-in instructions. This ability to interpret pre-programmed data and improve existing algorithms is the main property of AI that drives such rapid technological advances, applied to virtually every area of human life.[13]

In addition, when compared with traditional methods, AI comes as a great asset when dealing

[11] Olaf Zawacki-Richter et al., "Systematic Review of Research on Artificial Intelligence Applications in Higher Education – Where are the Educators?" *International Journal of Educational Technology in Higher Education* 16, no. 1 (October 2019): 3.

[12] Klaus Henning, *Gamechanger AI : How Artificial Intelligence Is Transforming Our World*, (Cham, Switzerland: Springer, 2021), 21.

[13] Hanchen Wang et al., "Scientific Discovery in the Age of Artificial Intelligence," *Nature (London)* 620, no. 7972 (August 2023): 48-50.

with tasks characterized by uncertainty and offers effective tools in solving such intricate problems.[14]

AI Applications

Artificial intelligence has found applications in a wide range of industries and domains. It has played a major role in the Fourth Industrial Revolution in the sought of interconnected and digitalized technologies that enable higher efficiency and low-cost production and services, in some cases yielding entirely new consumer goods and solutions.[15] The enhanced performance and efficacy of robots and software derive from the ability of AI to automatically make decisions concerning industrial processes.[16]

Engineering

Over the past decade, AI has found its way into nearly all domains of engineering. Significant attention has been directed to several AI branches or methods, including machine learning (MI), pattern recognition (PR), and deep learning (DL).[17] Through these methods engineers are able to predict systems' future performance and detect failures ahead of time based on the available set of data and written algorithms.[18] This may be seen as the self-learning and perfecting ability of AI. In addition, pattern recognition facilitates accurate classification and

[14] Hadi Salehi and Rigoberto Burgueño, "Emerging Artificial Intelligence Methods in Structural Engineering," *Engineering Structures* 171, (September 2018): 170.

[15] Organisation for Economic Co-operation and Development, *The Next Production Revolution: Implications for Governments and Business* (Paris: OECD Publishing, 2017), 27.

[16] European Parliament, *Opportunities of Artificial Intelligence*, 75.

[17] Salehi and Burgueño, "Emerging Artificial Intelligence Methods in Structural Engineering," 171.

[18] European Parliament, *Opportunities of Artificial Intelligence*, 18.

categorization of objects and features, such as images, signals, speech, handwriting, or measurements.[19]

One of the most revolutionary applications of these AI properties may be found in robotics and automation. This field of engineering is primarily concerned with the development of sustained software and algorithms yielding machines and devices that have the capacity to solve repetitive human tasks. It is an embodiment of physical existence and intellect in robots and equipment deployed in production lines, businesses, and households.[20]

Transportation

While AI is becoming ubiquitous in the engineering field, transit means remain no exception. Autonomous driving, that is, operating and navigating vehicle through intelligent technology that is capable of perceiving the environment, making decisions, and controlling maneuvers without human input, has recently been one of the most intensively researched topics in transportation. Another topical issue concerns the use of AI in medical mobility devices, utilizing human visual perception and trajectory decision-making abilities.[21] These are the latest developments and applications of AI to the transportation industry, succeeding the semi-autonomous vehicles now in place. This applies to several automobile manufacturers such as

[19] Salehi and Burgueño, "Emerging Artificial Intelligence Methods in Structural Engineering," 174.

[20] European Parliament, *Opportunities of Artificial Intelligence*, 17.

[21] Monika Hengstler, Ellen Enkel, and Selina Duelli, "Applied Artificial Intelligence and trust—The Case of Autonomous Vehicles and Medical Assistance Devices," *Technological Forecasting & Social Change* 105, (April 2016): 105.

Tesla, Mercedez-Benz, or Toyota, which are pioneers in producing vehicles with advanced driver assistance systems, used for instance in lane-departure warning, and blind spot alerting.[22]

AI is also becoming an integral part of the railway sector. It has found applications in traffic prediction, customer service, safety and security systems, but also in the previously examined autonomous driving, to name only a few examples.[23] This may be of paramount value, as public transportation and mass transit, if automated and entrusted by the public, could change the lives of many people and have an impact on the global economy, governments and the environment.

Healthcare

The clinical adoption of AI technology remains at an early stage. Nevertheless, the abundance of studies and pace of the implementation are on a rise, as research has shown that AI-based solutions may be indispensable in improving the treatment of many health issues, supplying data to support clinical decision-making, minimizing medical errors, making healthcare generally accessible, providing patients with better experiences and care outcomes, as well as reducing the costs of healthcare. Some medical specialties that have already benefited from AI implementation are oncology, neurology, and cardiology.[24]

The earliest use of AI in healthcare involved disease diagnosis and analytical devices, such as electrocardiogram (ECG) signals interpretation or biomedical image classification, for

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[22] Yifang Ma et al., "Artificial Intelligence Applications in the Development of Autonomous Vehicles: A Survey," *IEEE/CAA Journal of Automatica Sinica* 7, no. 2 (March 2020): 315.

[23] Nikola Besinovic et al., "Artificial Intelligence in Railway Transport: Taxonomy, Regulations, and Applications," *IEEE Transactions on Intelligent Transportation Systems* 23, no. 9 (September 2022): 14012.

[24] Lena Petersson et al., "Challenges to Implementing Artificial Intelligence in Healthcare: A Qualitative Interview Study with Healthcare Leaders in Sweden," *BMC Health Services Research* 22, no. 1 (July 2022): 2.

instance X-ray, Magnetic Resonance Imaging (MRI), tomography, or ultrasound, and appropriate treatment selection.[25] Some of the latest AI-based solutions in pharmacy and medicine include innovative robotic technologies, such as robotic surgical systems and assistive robotics, providing healthcare practitioners and surgeons in particular, with precision during procedures and improved patient monitoring systems. AI has also played a vast function in drug repurposing, analyzing the effects of existing drugs and predicting their potential efficacy in treating other diseases and conditions. It has also expanded the access to healthcare with virtual screening methods of chatbots and virtual health assistants.[26]

Food Administration

The world's events, population growth, and environmental changes, have all impacted food security across the globe. Traditional methods of food production and processing have proven obsolete in the face of these transitions. Conversely, several properties of AI have been shown to benefit food security, efficiency, and consumer satisfaction through the use of new food solutions and technologies. As a result, the application of AI in global food supply chains has significantly expanded.[27]

A range of medical devices with a built-in AI-based software were developed to diagnose, treat, and prevent diseases in food articles. Frequently adopted in the clinical testing, they have helped in maintaining regulations and reduced labor required to conduct these reviews

[25] Hui Wen Loh et al., "Application of Explainable Artificial Intelligence for Healthcare: A Systematic Review of the Last Decade (2011–2022)," *Computer Methods and Programs in Biomedicine* 226, (November 2022): 1-2.

[26] Maryna Stasevych and Viktor Zvarych, "Innovative Robotic Technologies and Artificial Intelligence in Pharmacy and Medicine: Paving the Way for the Future of Health Care—A Review," *Big Data and Cognitive Computing* 7, no. 3 (September 2023): 13-14.

[27] Manoj Dora et al., "Critical Success Factors Influencing Artificial Intelligence Adoption in Food Supply Chains," *International Journal of Production Research* 60, no. 14 (August 2021): 4621.

before products are licensed for the market.[28] Another AI-based opportunity harnessed to food production and plant cultivation is the modern practice of machine-assisted and rapid breeding, which reduces production time and allows selection of desired food product properties.[29]

Communications

It should be noted that communications may be analyzed in terms of human-human and human-machine interactions, both of which AI has played a significant role in. Several AI techniques, especially machine learning (ML) which "enables machines to learn from a massive amount of data and make decisions and/or perform actions accordingly without being given any specific commands," have been introduced into building wireless channels and networks.[30] Due to AI-based storage, processing, and sharing of data advancements, today individuals on the opposite sides of the globe may stay connected and interact regardless of time or geographical constraints. This is possible due to a stable interconnection of devices based on antenna-channel optimization and radio propagation, both of which have been enabled by ML-based solutions.[31] AI has hence played a major role in programming the currently used fifth-generation (5G) network and has even been used more in the current race for sixth-generation (6G) network. "Edge AI stands out as a disruptive technology for 6G to seamlessly integrate sensing,

[28] Thomas J. Hwang, Aaron S. Kesselheim, and Kerstin N. Vokinger, "Lifecycle Regulation of Artificial Intelligence– and Machine Learning–Based Software Devices in Medicine," *JAMA: The Journal of the American Medical Association* 322, no. 23 (December 2019): 2285-6.

[29] Javaid Akhter Bhat et al., "Recent Advances in Artificial Intelligence, Mechanistic Models, and Speed Breeding Offer Exciting Opportunities for Precise and Accelerated genomics-assisted Breeding," *Physiologia Plantarum* 175, no. 4 (June 2023): 1-2.

[30] Chen Huang et al., "Artificial Intelligence Enabled Radio Propagation for Communications - Part I: Channel Characterization and Antenna-Channel Optimization," *IEEE Transactions on Antennas and Propagation* 70, no. 6 (June 2022): 3940.

[31] Ibid., 3947-8.

communication, computation, and intelligence, thereby improving the efficiency, effectiveness, privacy, and security of 6G networks,"[32] technology that will enable interconnection of people and things, and even outer space, as AI researchers argue.[33]

Humans interact with the machines on a day-to-day basis. In fact, in order to communicate with another person through a device, one must first interact with the communicator; that is, the technology being used. Indeed, it is AI that has enabled the machines to be communicators rather than mere mediators.[34] The "talkative" technologies, such as Siri, Alexa, or Google Assistant, and social interfaces operating for the past two decades have heavily taken from the intelligent software. AI has also spawned the creation of virtual agents, socialbots, and language-generating software indispensable in today's messaging, social media, and other websites.[35]

Education

The application of AI in education (AIEd) dates back to the early days of its invention. In the recent years, however, an exponential increase in the implementation of AIEd could have been observed, with at least 43% growth between 2018 and 2022 alone.[36, 37] Intelligent software

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[32] Khaled B. Letaief et al., "Edge Artificial Intelligence for 6G: Vision, Enabling Technologies, and Applications," *IEEE Journal on Selected Areas in Communications* 40, no. 1 (January 2022): 5.

[33] Chen Huang et al., "Artificial Intelligence Enabled Radio Propagation for Communications," 3939.

[34] Julie A. Jacko, *The Human-Computer Interaction Handbook: Fundamentals, Evolving Technologies, and Emerging Applications*, 3rd ed. (Boca Raton: CRC Press, 2012), 36-37.

[35] Andrea L. Guzman and Seth C. Lewis, "Artificial Intelligence and Communication: A Human–Machine Communication Research Agenda," *New Media & Society* 22, no. 1 (January 2020): 70.

[36] Zawacki-Richter et al., "Systematic Review of Research on Artificial Intelligence Applications in Higher Education,"1.

has aided both teaching and learning, impacting faculty members, counselors, principals, and students. Some of the cutting-edge AI-based solutions include intelligent tutoring systems, which plan out the learning path and select content for an individual student; intelligent virtual reality, which enables remote labs and exercises for students, primarily in STEM; and real-time AI analytical tools for feedback and assessment.[38] The application of AI has also drastically changed computer-assisted language learning, especially advancing vocabulary and grammar skills among students, as well as special education, particularly beneficial for students with autism.[39]

ChatGPT

In 2022, an American firm, OpenAI, released a language model based on the Generative Pre-trained Transformer (GPT) architecture, which has introduced general community to interaction with AI on a scale like never before, in short "ChatGPT". In simplest terms, it is an intelligent chatbox that offers real-time conversations resembling human-to-human communication, drawing on the data provided, including emotional or opinion-based analysis of events.[40] As the intelligent systems proved to be irreplaceable in a rapidly growing industry, a means to combat general skepticism and resistance had to be devised. "ChatGPT is part of a strategy of acclimatizing the public to the seismic changes that are imminent because of artificial

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[37] Xieling Chen et al., "Two Decades of Artificial Intelligence in Education: Contributors, Collaborations, Research Topics, Challenges, and Future Directions," *Educational Technology & Society* 25, no. 1 (January 2022): 38-39.

[38] Zawacki-Richter et al., "Systematic Review of Research on Artificial Intelligence Applications in Higher Education," 4.

[39] Chen et al., "Two Decades of Artificial Intelligence in Education," 40.

[40] Marta Olasik, "'Good Morning, ChatGPT, can we Become Friends?' an Interdisciplinary Scholar's Experience of 'Getting Acquainted' with the OpenAI's Chat GPT: An Auto Ethnographical Report," *European Research Studies* 26, no. 2 (April 2023): 270.

intelligence," postulated the co-founder of AI.[41] Ever since, the model has reshaped the lives of individuals, as it has made all of the previously discussed improvements not only evident to the public, but more significantly, widely accessible. To name only a few of the benefits, it has assisted people in academic research, coding, translation, idea generation, data analysis and revision, and problem solving. A variety of studies have also considered ChatGPT's unique role in health, global warming, and drug discovery.[42]

AI Propulsion of Globalization

Fourth Industrial Revolution

What primarily drives global development and innovation are industry and the production of consumer goods. Over the centuries, it has been the nations with the finest development and innovation that have played a pivotal role on the international stage and enjoyed the greatest growth and prosperity. In this perspective, the 19th century belonged to Western Europe, and the British Empire in particular, in the 20th century the United States emerged as a global superpower, and the 21st century has demonstrated a growing influence of East Asia, with China as its pioneer.[43] The world has seen four industrial revolutions. The first constituted the advent of steam-powered mechanical production equipment around 1780s, the second brought about electrically powered mass production in 1870s, and the third one spawned the initial

[41] Flora Graham, "Daily Briefing: What's the Endgame of OpenAI, the Creator of ChatGPT?" *Nature (London)*, (September 2023), https://www.nature.com/articles/d41586-023-02849-2.

[42] Olasik, "'Good Morning, ChatGPT, can we Become Friends?'" 272.

[43] John M. Roberts, *A Short History of the World*, (New York: Oxford, 1997), 402-420.

electronically based, automated production in 1960s, although not nearly as advanced as technological innovations of the 21st century.[44]

According to the US State Department, AI is at the center of the Fourth Industrial Revolution, or "Industry 4.0," which refers to the current application of interconnected digital technologies and intelligent systems that enable the use of low-cost second-generation robotics in the global production.[45] With every industrial revolution, a number of countries focus their efforts on technological advancements, positioning it as the primary objective and underlying guideline for policymaking. This may be observed in the proliferation of major national initiatives for advanced manufacturing, such as the National Network for Manufacturing Innovation in the United States, Japan's Robot Strategy, the People's Republic of China's Made in China 2025, or Germany's Industry 4.0 Initiative.[46]

The Fourth Industrial Revolution, and AI advancements in particular, have spawned a race between the world's leading powers. It bears resemblance to the Space Race and the Arms Race, frequently used in the context of the Cold War, and referring to the competition between the US and the Soviet Union; although today it may be applied to other major players; to achieve significant milestones in technology and military equipment.[47] Such efforts frequently spur cooperation between nations and parallel surveillance and even replication of the progress of

[44] Organisation for Economic Co-operation and Development, *The Next Production Revolution*, 27.

[45] US Department of State, *Artificial Intelligence (AI)*.

[46] Organisation for Economic Co-operation and Development, *The Next Production Revolution*, 27.

[47] Rens van Munster and Casper Sylvest, "On History and Authority: The Cold War Nuclear Arms Race and its Importance for Critical Security Theory," *Critical Studies on Security* 10, no. 3 (September 2022): 160.

more adverse countries. Remarkably, these global trends, currently driven by the expansion of AI, align with the direction of globalization.

Global Partnership on Artificial Intelligence

The proliferation of AI into virtually all areas of human life has brought a range of ethical implications, challenges, and risks. These perils to humankind are frequently referred to by the term "existential risks."[48] As technological development, and in particular innovation in AI, will not slow down in the near future but rather accelerate, many governments around the world have created legal frameworks for it. This is especially true for global institutions such as the United Nations, which aim to combat some of the major threats posed by the uncontrolled expansion of AI. One of the fields already recognized as of major adverse outcome for the world's security and prosperity is biotechnology, and in particular nuclear power and weaponry. Another, less frequently addressed issue, is the emergence and ongoing development of "artificial general intelligence (AGI)" or "strong AI," which differs from the common intelligent software in that it exceeds human intelligence and, as some argue, may pose a threat to the very existence of mankind.[49]

These existential risks have brought nations together in the Global Partnership on Artificial Intelligence (GPAI), defined by the US Department of State as "a voluntary, multi-stakeholder initiative launched in June 2020 for the advancement of AI in a manner consistent with democratic values and human rights. GPAI's mandate is focused on project-oriented collaboration, which it supports through working groups looking at responsible AI, data

[48] Reinmar Nindler, "The United Nation's Capability to Manage Existential Risks with a Focus on Artificial Intelligence," *International Community Law Review* 21, no. 1 (March 2019): 5.

[49] Ibid., 10-13.

governance, the future of work, and commercialization and innovation."[50] This initiative founded by the United States along with other similar cooperations have been a considerable factor in driving the trend of globalization. One of the joint efforts undertaken by international entities concerns the safe use of AI-based tools, privacy, and patent protection in a world of shared data.[51,52] Environmental protection is a growing area of cooperation and regulatory measures, as the rampant industrialization of the 21st century has led to the depletion of natural resources, higher waste generation, and deterioration of fragile ecosystems.[53] Finally, there has been an increased cooperation of nations on regional security, combating the malevolent use of smart technology in surveillance and espionage, such as facial recognition embedded in the latest cameras, intelligence operations writing by smart software, and sensitive information dissemination.[54] Remarkably, in countering most of the threats and challenges posed by AI, the utilization of such technology is imperative. As greater societal risks arise from AI advancement and further innovation is required to offset this effect, the world is uniting through global expansion and its dynamics, demonstrating what an influential driver of globalization artificial intelligence is.

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[50] US Department of State, *Artificial Intelligence (AI)*.

[51] Keng Siau and Weiyu Wang, "Artificial Intelligence (AI) Ethics: Ethics of AI and Ethical AI." *Journal of Database Management* 31, no. 2 (April 2020): 80-81.

[52] Günter Cisek, *The Triumph of Artificial Intelligence: How Artificial Intelligence is Changing the Way we Live Together*, 1st ed. (Wiesbaden: Springer, 2021), 124.

[53] Peter Dauvergne, "Is Artificial Intelligence Greening Global Supply Chains? Exposing the Political Economy of Environmental Costs," *Review of International Political Economy : RIPE* 29, no. 3 (May 2022): 696.

[54] William J. Burns, "Spycraft and Statecraft: Transforming the CIA for an Age of Competition," *Foreign Affairs* 103, no. 1 (January 2024), https://www.foreignaffairs.com/united-states/cia-spycraft-and-statecraft-william-burns.

Global Citizenry

The 21st century world has observed the greatest normalization of lifestyle trends and development of common cultural conventions. The language barrier, geographical and time constraints, selection of music, cinematography, fashion, architecture, and countless others, are gradually waning. These trends, bringing masses together and rendering them increasingly alike, have inadvertently created a global community, if not in the political sense, certainly in the social realm. There are commonalities around the world in how people dress, what they eat, what technology they use, and what cultural works they reach for. It must be noted then, that it is AI that has primarily driven the "indigenization, a form of cultural change in which traditional societies superficially adopt something foreign, but then integrate it into their traditional culture as something culturally adaptive of their own."[55]

One way people come to share their opinions is through the news to which they are exposed. In today's reality, news outlets are increasingly influenced by AI, which standardizes the language used, amplifies the events shared and creates memes that enjoy large audiences in very distinct communities.[56] In addition, search bot assistants, such as Bing assistant, sort out all accessible information in the search results providing the audience with the most popular facts and incidents, thereby unifying what the majority of the population reads. What one reads and experiences, in turn, influences what one ultimately believes. Considerable research has supported that the use of the Internet, and in particular AI-based online solutions, has fully

[55] Cisek, *The Triumph of Artificial Intelligence*, 124.

[56] Ibid.

reshaped the way people browse for information, consume media and entertainment, and manage social networks and relationships online.[57]

Cross-cultural familiarization and blending have also been byproducts of the widespread use of mobile personal devices, equipping the users with facial recognition, mobile visual location recognition, and mobile augmented reality – known also as virtual reality (VR) – and thus, introducing diverse experiences to better understanding and sharing.[58, 59] These are all examples of AI-derived tools. Intelligent translation robots deployed in conversations, either personal or remote, have further enabled people across the globe to communicate with each other without interference, misunderstandings, or delays.[60] Yet, all these social advancements in a sense forging a global citizenry would not have spread on such a mass scale without ever-growing immigration, which AI plays an indisputable role in.

Immigration may be differentiated into economic or asylum seeking, both of which have been on a rise in the 21st century. Due to the AI-solutions in workplace, and primary manufacturing, economic migrants find themselves well-accustomed to traveling towards wealthier countries that now seek low-skilled cheap labor for handling machinery and robots that incorporate smart technologies. This does not solely impact the migration flow, but also redistribution of financial resources through remittances, creating a capital outflow from the United States, European Union, or Japan among the others, to less prospering countries, as well

[57] Joseph Firth et al., "The 'Online Brain': How the Internet may be Changing our Cognition," *World Psychiatry* 18, no. 2 (June 2019): 119.

[58] Tao Guan et al., "On-Device Mobile Visual Location Recognition by using Panoramic Images and Compressed Sensing Based Visual Descriptors," *PloS One* 9, no. 6 (June 2014): 1.

[59] Edmanuel Cruz et al., "An Augmented Reality Application for Improving Shopping Experience in Large Retail Stores," *Virtual Reality: The Journal of the Virtual Reality Society* 23, no. 3 (September 2019): 287.

[60] Cisek, *The Triumph of Artificial Intelligence*, 124.

as labor price equalization.[61] This, in turn, leads to an alleviation of wealth disparities and likening of skill sets in the global society. Similarly, with the development of more innovative AI technologies and increased movement of people across borders, several states have recognized new technological capabilities for a swift and more controlled movement of refugees. AI-based tools such as facial, voice, and DNA recognition, along with biometric matching have facilitated asylum management and documentation, while allowing refugees to travel across borders expeditiously, as opposed to remaining in migrant settlements awaiting their processing.[62]

Global Government

A growing number of legal issues arise from AI development, which has promptly been entrusted with personally sensitive information that has never been vested in any government. Although in recent decades national and regional governments, such as the European Parliament, have tried to curb the expansion of AI power that infringes on people's sovereignty and protection, the pace and branching of smart technology seems to be getting out of control.

One of these issues involves the employment of AI for the oversight of personal data and patents. This sensitive data has now been evidenced to be easily disseminated to third parties by AI. Another authority that smart technologies have gained is over the medical records, no longer confined to a single medical facility, let alone one's personal physician.[63] This stems directly from entrusting AI with administration of healthcare data, one of the applications of the newest

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[61] Ryszard Piasecki, Miron Wolnicki, and Erico Wulf Betancourt, "Artificial Intelligence in the Context of Global Resource Mobility. What can be Expected from it?" *Comparative Economic Research. Central and Eastern Europe* 24, no. 3 (September 2021): 99.

[62] Lucia Nalbandian, "An Eye for an 'I:' a Critical Assessment of Artificial Intelligence Tools in Migration and Asylum Management," *Comparative Migration Studies* 10, no. 1 (August 2022): 15.

[63] Cisek, *The Triumph of Artificial Intelligence*, 129.

technology in the field. Another concern involves robotic lawyers, supposedly objective and free of misjudgment. In fact, any decision made by the algorithm is viewed more rational than that of a human with irrepressible emotions and biases. No personal characteristics, such as age, gender, physical or mental constitution, are taken into account by the fully rational systems. In a study conducted by MIT, it has been demonstrated how different nationalities vary in their legal decisions, while AI-based judges apply one uniform algorithm to all cases.[64]

It is worth addressing the previously raised discussion of virtual reality (VR) heavily based on intelligent systems. Now offered to the general public, the devices immersing one into a brand new reality without any restrictions. are about to spread across the globe. One may now use VR technologies not solely for entertainment, but also in science and industry, and even daily life simulations, including social meetings and traveling without leaving one's property.[65] In the medical field, for instance, VR may be used to project organs and visualize enzymes, just as in engineering it may be used to display virtual constructions and 3D models, which lead the design industry: "Representational technology via goggles or headset has now reached the point where no significant differences between reality and virtuality are discernible to our sensory organs."[66] However, in this constructed world, there is no sovereign government or fixed law, all authority is vested in AI-derived tools.

Algorithms are allotted progressively more power, gradually becoming in a sense a global government, without existing means of checking and balancing its authority. It stores data

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[64] Cisek, *The Triumph of Artificial Intelligence*, 130-131.

[65] Myung Ja Kim and Michael C. Hall, "A Hedonic Motivation Model in Virtual Reality Tourism: Comparing Visitors and Non-Visitors," *International Journal of Information Management* 46, (June 2019): 237.

[66] Holger Volland, *The Creative Power of Machines*, (Weinheim: Beltz, 2018), 186.

of its users around the world, makes decisions for businesses and service providers, begins to discern medical and legal issues, and performs in national security and monitoring. The challenge lies in the fact that AI is rarely held accountable, as the world continues to view it as "'weak' AI without a will and consciousness of its own" and therefore not possible to hold criminally responsible in lieu of its creator or user.[67] AI is imperceptible in facilitating the gradual emergence of a global government, and thus propelling globalization in its broader sense.

Global Production

When considering the process of globalization, most discussions and analyses are framed within a political context. Emphasis is placed on the emergence of a single global government overseeing nationless societies. While this is the product of global expansion in its terminal form, it can be argued that "it is not politics but economics that has primacy and will continue to pursue it stringently in the sense of a world economic community."[68] Such an establishment flows naturally from the unification of global production, trade, and distribution of consumer goods. It also does not raise concerns among the general public, as their rights are not infringed upon by a single entity in power. In fact, having access to virtually any commodity seems to expand one's freedom of choice and growth opportunities.

Notwithstanding the apparent risks of entrusting the world's supply chain to intelligent algorithms, several salient benefits are delivered by these software that sustain their continued innovation. According to the Organisation for Economic Co-operation and Development

[67] Cisek, *The Triumph of Artificial Intelligence*, 129.

[68] Ibid., 124.

(OECD), intelligent systems may nearly completely eliminate errors in a range of manufacturing processes. Machine downtime and repair costs may be significantly reduced when AI monitors and anticipate maintenance needs. Industrial products may be enhanced owing to virtual simulations and AI predictions. Data-driven supply chains greatly minimize the time of delivery and lower the failure rates for new product launches that do not meet the demand.[69]

The process of automation spurring high efficiency in consumer goods manufacturing, cheap products on the global market, and growing welfare of the low-skilled laborers may be undoubtedly attributed to the development and proliferation of AI.[70] Use of the newest technology and software in previously examined engineering, transportation, and communications, has significantly increased the processing potential of the global supply chain. As information technology practitioners introduce AI to enhance the productivity and efficiency gains, they concurrently aid transnational corporations (TNCs), including technology firms such as Google, Microsoft, or Tencent, electronics manufacturers, e.g., Apple and Samsung, and online retailers such as Alibaba and Amazon. These and other TNCs have been investing heavily in AI tools that offer them a business advantage over smaller enterprises, low-cost extraction of natural resources, more efficient operations, and sales growth.[71] In this frantic race for exploitation of the new commercial opportunities and short-term profits, the leading companies began to disregard (or refuse to address) issues such as cultural diversity, vulnerable populations,

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[69] Organisation for Economic Co-operation and Development, *The Next Production Revolution*, 29.

[70] Piasecki, Wolnicki, and Wulf Betancourt, "Artificial Intelligence in the Context of Global Resource Mobility," 95.

[71] Peter Dauvergne, "Is Artificial Intelligence Greening Global Supply Chains? Exposing the Political Economy of Environmental Costs," *Review of International Political Economy : RIPE* 29, no. 3 (May 2022): 696-697.

and environmental challenges, concurrently leading to labor docility.[72] Essentially, AI has become a tool of power in the worldwide economic context, often exacerbating the global inequality and exploitation of global reserves in the quest for expansion.

Dissenting Theories

Amidst extensive academic discussion, there is a number of various theories that seek to identify the underlying cause of the advancing process of globalization. These ideas, originating from fields such as economics, sociology, or political science, provide distinct viewpoints, emphasizing factors such as technological innovation, business strategies, along with cultural and economic disparities worldwide. While there remain numerous hypotheses concerning the catalysts of globalization due to its multifaceted nature, the most prevalent include Modernization, World Systems, Multinational Corporations, Dependency, and Cultural Diffusion theories.

Modernization Theory

One frequent explanation of the advancing trend of globalization is the modernization of the societies. This is due to the technological advancements, industrial and urban innovations that ultimately lead to interconnectedness and interdependency among the contemporary communities and their cultures. Accordingly, modernity provides for reconstruction of society to liberate it from unnecessary constraints on human progress, and allows it to seize unrealized opportunities.[73] In economic terms, this theory presupposes that improvements in

[72] Pesqueux, “What is Globalization?” 14.

[73] Chamsy El-Ojeili and Patrick Hayden, *Critical Theories of Globalization*, (New York: Palgrave Macmillan, 2006), 12.

communications and transportation sectors providing unrestricted flow of goods, services, and information, create a single global market and hence a global community.[74]

World Systems Theory

Developed by sociologist Immanuel Wallerstein, this theory posits that globalization is driven by the expansion of capitalism, where the world economy expands and reorganizes under the lead of most powerful states. In this view, the capitalist system distinguishes the core countries which develop quickly at the expense of more peripheral players, exploiting their natural and human resources.[75] This is a postulate formulated also earlier by Marxists, who believed that the bourgeoise, the oppressing class, could not exist without a constant revolution in the means of production. Their quest for the expansion of market for global production resulted in abolishing the old-existing national industries, compelling all nations to universal interdependence and cooperation in the global expansion.[76]

Multinational Corporations Theory

The world economy exhibits a peculiar trend towards economic integration without parallel growth in political and social institutions which would oversee and direct these transformations. Many argue that these governing authorities are gradually superseded by multinational or previously discussed transnational corporations (TNCs), whose activities are

[74] El-Ojeili and Hayden, *Critical Theories of Globalization*, 18.

[75] Chamsy El-Ojeili, *Politics, Social Theory, Utopia and the World-System: Arguments in Political Sociology*. 1st ed. (New York: Palgrave Macmillan, 2012), 45.

[76] El-Ojeili and Hayden, *Critical Theories of Globalization*, 15.

rarely subject to regulation by the national governments exercising jurisdiction over them.[77] In line with this theory, it is the global expansion of multinational corporations, which ultimately begin to organize labor and promote worldwide principles, often challenging ethical or cultural identities, that propels globalization.

Dependency Theory

Another interpretation of accelerating globalization lies in an uneven development and backwardness of certain nations. According to this view, developing countries are reliant on developed countries in terms of resources and markets, which only perpetuates their underdevelopment.[78] One instance of such relationship may be Sino-African engagement in economic partnership, cooperation, and solidarity. Nonetheless, the presence of an industrialized and highly developed country in a less affluent region poses a risk of re-orienting the values of and exploiting the weaker nation further by addressing its own developmental needs and priorities.[79] This process occurring in several regions worldwide would increasingly result in blurring of the borders and cessation of nation-states, paving the way for the global ascendancy of the leading industrial powers.

Cultural Diffusion Theory

Some scholars argue that globalization is predominantly driven by the dissemination of ideas, values, and practices across borders, which ultimately fosters the formation of a global

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[77] Bruce Kogut, "Multinational Corporations," in *International Encyclopedia of the Social & Behavioral Sciences*, (Oxford: Pergamon, 2001), 10202-3.

[78] Ronald H Chilcote, "Reflections on 'Imperialism in the Financial Capital Era: Forgotten Contributions from Marxist Dependency Theory'," *The Review of Radical Political Economics*, (August 2023): 1.

[79] Motolani Agbebi and Petri Virtanen, "Dependency Theory - A Conceptual Lens to Understand China's Presence in Africa?" *Forum for Development Studies* 44, no. 3 (January 2017): 429.

cultural identity.[80] This exchange and diffusion follow one of three differentiated patterns. Homogenization thesis argues the existence of cultural convergence, whereby the global community is gradually standardized around a Western or American thought. Hybridization thesis points to the pervasive global intermingling of cultures, rendering the current model of nations with distinct, pure cultures obsolete. Finally, polarization thesis suggests the emergence of distinct cultural worlds of antagonistic ideologies and practices. These cohesive poles are to be formed in lieu of the current nation-states, united by shared values and moving away from opposing spheres.[81]

Concluding Analysis

Scholarly sources cite various theories of the modern day rapid globalization. However, numerous factors contribute to the process, making it unlikely that any single theory can fully explain it. One commonality shared by the most prevalent and quoted theories is their lack of consideration of the role that AI plays in the global expansion. Yet, bearing in mind the ample analysis of AI development and application, one may argue that the creation of smart software is in fact a fundamental factor in the theorized processes and events that purportedly propel globalization.

Discussion on Deglobalization

An objective examination of globalization exposes the concurrent rise of an adversarial process, particularly evident in the aftermath of the 2008 global financial crisis. Deglobalization, a slowdown or reversal of global expansion, implies a decline in global exchange and the

[80] El-Ojeili and Hayden, *Critical Theories of Globalization*, 134.

[81] Robert Holton, "Globalization's Cultural Consequences," *The Annals of the American Academy of Political and Social Science* 570, no. 1 (2000): 140-141.

restoration of national control over trade, politics, and social affairs.[82] The concomitance of these two contrasting processes appears counterintuitive, although the balance undoubtedly tilts towards globalization. The unfolding of globalization in line with the liberal world order explains the rise of opposing values and the challenges posed by competing interests.[83] While the increased cohesiveness of international relations has provided tremendous opportunities and moved mankind by leaps in efficiency, mobility, and communication, it has also generated a number of threats to national prosperity, security, and the unity of culture and convictions of certain states. Consequently, a growing number of governments have advocated for the reclamation of national control over the political and economic spheres from the expanding neo-liberal institutions such as G7, the World Bank, the International Monetary Fund, and the World Trade Organization.[84]

AI, akin to globalization, contributes to the phenomenon of deglobalization. It may be argued that the deployment of AI-tools in the international production and trade has negatively impacted global resources mobility, displaced many high-skill workers, and factored into a capital outflow from countries such as the US, EU member states, and Japan.[85] This, in turn, has prompted policymakers to prioritize national interests over the objectives of global institutions. The innovation of AI has also intensified competition between its pioneering developers, such as the United States and People's Republic of China, often inhibiting their global cooperation.

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[82] Ripsman, "Globalization, Deglobalization and Great Power Politics," 1328.

[83] Markus Kornprobst and Thazha V. Paul, "Globalization, Deglobalization and the Liberal International Order," *International Affairs* 97, no. 5 (September 2021): 1308.

[84] Ripsman, "Globalization, Deglobalization and Great Power Politics," 1328.

[85] Piasecki, Wolnicki, and Wulf Betancourt, "Artificial Intelligence in the Context of Global Resource Mobility," 94.

Further, AI domestic and international regulation have created significant barriers to global trade and globalization at large.[86] Cybersecurity issues have escalated around the world, which alongside the proliferation of the latest AI-based military technology and weaponry, have changed the approach to national defense and policymaking at the state level. For instance, in combating the malevolent use of smart technology in surveillance and cybercrime, similar AI-tools have been utilized.[87] However, these examples demonstrate that the trend of deglobalization, influenced by AI, largely stems from the initial acceleration of globalization driven by smart software and technology.

Conclusion

Artificial intelligence has long left an imprint on today's world. The consequences of its advancement and proliferation in such a vast array of fields applied to human life may be observed in virtually every locality of the world. As a result, societies have become progressively uniform in thought, behavior, and life priorities. This trend will prevail as AI continues to be researched and developed more than ever before, and will eventually form a global citizenry that will challenge the current nation-state model and determine the future of the presently contesting democracies and autocracies. Local and regional governments will then determine how to manage the arising challenges and how to preserve what has remained of unique cultures and social identities. Their "success will depend on blending traditional human intelligence with emerging technologies in creative ways. It will require, in other words, adapting to a world

[86] Takatoshi Ito et al., "Deglobalization: Editors' Overview," *Asian Economic Policy Review* 19, no. 1 (January 2024): 14-15.

[87] Burns, "Spycraft and Statecraft."

where the only safe prediction about change is that it will accelerate."[88] It is evident that a series of individual countries' reforms will address policymaking, national defense, immigration management, industrial development, education, human service, among many other issues. These transformations will consistently have a common threat, they will progress towards globalization, propelled by the unprecedented force of AI, which true capabilities and potential the world has yet to discover.

[88] Burns, "Spycraft and Statecraft."

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