



The Technological Singularity: The New Beginning or End of Human Civilization

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Article History Received : 2025-04-6 Revised: 2025-05-7 Published: 2025-05-30 Keywords: <i>Technological Singularity; Artificial Intelligence; Society 5.0</i>	Technological singularity refers to the point at which artificial intelligence (AI) surpasses human intelligence, creating fundamental changes in civilization. This concept involves the exponential acceleration of technological development with significant social, economic and ethical impacts. This research aims to explore singularity as an opportunity or threat to human existence. Through a literature-based qualitative approach, philosophical analysis is used to understand fundamental issues related to ethics, ontology, and the relationship between humans and technology. Singularity has the potential to be a new beginning by enabling the integration of technology and human values, as in the concept of Society 5.0. However, challenges such as technology access gaps, algorithm bias, and misalignment of goals between humans and AI can lead to social dystopia. By examining the relationship between humans and technology, this research provides a critical basis for policy making oriented towards sustainability and prosperity in the era of technological singularity. The results of this research provide new insights into how the singularity can profoundly shape the future of human civilization.

I. INTRODUCTION

At the beginning of the 21st century, advances in information technology have reached a phase where interactions between humans and machines have not only become a reality, but also an integral part of everyday life. The digital revolution has brought about a profound transformation in the way humans work, communicate and even process information. Cutting-edge technologies ranging from computers to mobile devices now serve as an extension of human cognitive abilities, enabling instant access to information and the completion of tasks that were previously considered impossible.

The notion of the singularity, which refers to the point when artificial intelligence (AI) surpasses human intelligence, has been the subject of significant discussion among academics, futurologists and the public at large. The concept not only describes the exponential acceleration of technological development, but also encompasses the various ethical, social and economic

implications that come with it. On the one hand, there is optimism that AI and automation can contribute greatly to the benefit of humanity, such as increasing efficiency, solving complex problems, and improving the quality of life. However, on the other hand, there are concerns regarding the risk of job loss, increasing social inequality, and the potential loss of control over the technology that has been created. (Ramadhani, 2024).

The key question that arises is whether the singularity will be a new beginning for human civilization or will it mark the end of human control over their own destiny? What are the implications of the singularity for human existence and values in the context of evolving technology? Therefore, an in-depth exploration of the singularity, both as a promising opportunity and as a potential threat, is needed to understand its impact on the future of civilization. This study is not only technical, but also involves deep philosophical reflection on ethics, ontology, and the relationship between humans and technology.

Singularity challenges basic assumptions about what it means to be human in a world increasingly dominated by machines with superior intelligence. In addition, it raises issues about the fairness of the distribution of technological benefits, potential social vulnerabilities due to unequal access, and moral dilemmas associated with the creation of autonomous artificial intelligence.

This research aims to analyze technological singularity as a phenomenon that has the potential to fundamentally change the dynamics of human civilization. Philosophy plays an important role in this research as it offers conceptual tools to understand the fundamental issues that arise from technological singularity. By integrating a philosophical perspective, this research is expected to contribute to the development of more critical and balanced thinking about the singularity. The results can serve as a basis for ethical and policy decision-making that is oriented towards sustainability and human well-being in an era of increasingly advanced technology.

II. RESEARCH METHODS

This research utilizes a qualitative approach with critical reflection, particularly to discuss the ethical and social implications of technological singularity, including the issue of technological access inequality. It is literature-based, drawing on previous works and utilizing theories from philosophers to provide a conceptual foundation. In addition, it takes a multidisciplinary approach, integrating concepts from the fields of philosophy, technology, and social science to discuss singularity to explore the impact of singularity on human values and civilization.

This critical review of the literature contributes to the development of critical thinking and sustainable policy-making in the era of advanced technology. It examines singularity as a phenomenon that can change the dynamics of human civilization. This research focuses on philosophical analysis as the main tool to explore the relationship between humans and technology in the context of singularity.

III. RESULTS AND DISCUSSION

A. The Concept of Technological Singularity

For a long time, humans have been creating tools to make life easier. But what happens when our tools, the machines, become smarter than us? The concept of 'singularity' describes the moment when artificial intelligence surpasses the limits of human capabilities. History has shown that technology has always evolved at a rapid pace, and the singularity may be a new chapter in technological evolution that will bring great changes to human civilization.

The main characteristic of the technological singularity is the emergence of a new world, as well as a new society, a new society not made up of humans themselves, but highly sophisticated machines that can self-replicate and produce newer and newer machines over time. We won't be part of the grand scheme of things anymore. We will likely be referred to as primitive, rudimentary biological beings. In the distant future, if the technological singularity does exist, none of us will be there to understand what it means. (Dufour, 2017).

To talk about AI is to talk about human inventions that will continue to be updated indefinitely as long as humans exist. Until now, technological advancements and innovations such as the dramatic increase in computing power. Technology is something that cannot be held back, in line with Evolutionary Theory where this theory explains that technological change can occur due to the continuous search for technological innovations

AI has both positive and negative sides. One of them is in education, where AI can help students learn more effectively. Information technology is also getting more sophisticated, especially in combining various media such as audio, video, and data. For example, smart cards in hospitals can store a patient's medical history. In the business world, e-commerce is one example of a very popular utilization of information technology. The rapid advancement of AI raises serious concerns. Many jobs that were once done by humans are now in danger of being replaced by machines. AI is considered more efficient and

accurate, so companies prefer to use this technology to reduce operational costs.

The concept of singularity was first introduced by mathematician and futurist John von Neumann in the 1950s, then further developed by computer scientists such as I. J. Good and Ray Kurzweil. Von Neumann predicted that technological development would continue to accelerate until it reached a point where the changes became too rapid to predict or fully understand. Ray Kurzweil, in his work *The Singularity is Near* (2005), expanded on this idea by stating that the singularity will be reached when artificial intelligence (AI) surpasses human intelligence. Kurzweil argues that technology is evolving exponentially and will bring about fundamental changes and radical transformations in various aspects of human life.

Since then, significant advances in technology, particularly in the fields of artificial intelligence and machine learning, have brought the realization of the singularity closer. This can be seen, for example, from the achievements in deep learning algorithms, where computer systems are able to learn and adapt from data in a way that previously only humans could. In addition, Augmented Reality (AR) and Virtual Reality (VR) technologies have begun to be implemented in various fields, including education, to create more interactive and immersive experiences.

Singularity technologies, with their potential to revolutionize the way we work, learn and interact, offer great opportunities to improve educational effectiveness. However, its implementation also poses challenges that need to be considered, such as infrastructure readiness, privacy protection, and significant implementation costs. Therefore, an in-depth understanding of the concept and development of these technologies is crucial so that we can devise appropriate strategies to integrate singularity technologies into the education system and optimize their benefits.

The implementation of artificial intelligence (AI) has become part of everyday life, such as features in Google Maps applications, facial recognition, automatic text correction tools, search algorithms, and so on. Today, AI has demonstrated superior capabilities in certain

areas, even surpassing human capabilities in very specific contexts, such as playing chess, driving a vehicle under normal conditions, or performing repetitive tasks. However, technology and information continue to undergo rapid development. Therefore, it is inevitable that in the future there will be increasingly sophisticated implementations of AI, including robots that are fully capable of performing human tasks. (Tresnawati et al., 2017).

The evolution of technology according to Ray Kurzweil is a human creation that starts through simple mechanisms and develops into automata or complex automated mechanical machines. Which eventually becomes sophisticated computing and communication devices. The technology itself is able to sense, store and evaluate complex patterns of information. To compare the speed of biological evolution of intelligence with the evolution of technology, we can take the example of mammals. Mammals have added about one cubic inch of brain matter every hundred thousand years, whereas we roughly double our computing capacity every year. Of course, neither brain size nor computing capacity are the sole determinants of intelligence, but they represent enabling factors. (Kurzweil, 2005).

Like the evolution of our species happened over a span of only a hundred thousand years. In technology, if we go back fifty thousand years, not much happened over a period of a thousand years. However, in the past we have seen new paradigms such as the World Wide Web, develop from scratch to mass adoption. In the sense that it was used by a quarter of the population in developed countries in just a decade. The technological singularity can also be referred to as the point where computational capabilities and artificial intelligence (AI) surpass human capabilities, leading to drastic changes in human life and society. There are three concepts of the law of technological singularity according to Kurzweil, namely:

1. Law of Acceleration: Technology develops exponentially, not linearly.
2. Law of Dependency: The willingness of technology depends on the previous willingness.

3. Universal Law: All fields of science and technology are interrelated.

The technological singularity is linked to the creation of artificial intelligence (AI). Machines with cognitive skills that rival or surpass humans. However, there is little consistency beyond that. It can refer to AIs that are able to redesign themselves to be more capable, and use that ability to redesign themselves further which can lead to an explosion of intelligence. AI's rapid capabilities are capable of surpassing human understanding and escaping our control. This shows a breakdown in our ability to predict anything after AI is created.

A singularity in the model that undermines our ability to predict does not mean that the world has gone mad. However, it does suggest that standard human tools are becoming inadequate to understand and shape what comes after. In a sense, the prevalence of robots and AI on our TV and computer screens has made us less prepared for the arrival of AI at will. For example, considering the potential for AI or robots to take over human jobs. It is precisely our uncertainty and doubt about how things will play out that makes it clear that our fictions and conceptions of AI as "another technology" may leave us unprepared for how transformative they can be. (Callaghan et al., 2017).

AI complements rather than replaces human labor, and radical political ideas to use the surplus generated by AI to guarantee a basic income for everyone. However, what is often underestimated is the speed of change. Precisely because AI can have general intelligence and therefore the ability to adapt to new situations, AI can quickly be used in jobs of all types and descriptions. Human professions disappear every time AI discovers new skills and there is a possibility of AI becoming superintelligence resulting in actual opportunities or risks.

B. Singularity as a New Beginning

Technology has now become an integral element in human life. Martin Heidegger, a German philosopher who adheres to the philosophy of existential phenomenology, views technology and humans as an inseparable entity.

In his perspective, the human body and technology form a phenomenological relational relationship. (Hartanto, 2014). Humans understand reality through the mediation of scientific tools that are interpreted by technological constructions. This opinion is reinforced by Don Ihde, a philosopher who focuses on science and technology, who states that there is an inherent unreachability between humans and the world they live in. However, technology allows humans to reach a world that was previously unreachable. Thus, technology functions as an extension of human existence, creating a relational unity between humans and technological tools in their efforts to understand and interact with the world.

Humanity's relationship with technology has been going on since pre-historic times. In fact, human ancestors have used technology as an integral part of adapting to the world. Discoveries such as flat stone tools, pottery, and paintings in ancient caves prove that science and technology have played an important role in the lives of pre-historic humans. A significant advancement in technology occurred in 1764, when James Watt, a British engineer invented the efficient steam engine. Prior to this invention, transportation and load transfer was entirely dependent on human and animal power. The invention of the steam engine allowed transportation to be effective and economical, while reducing dependence on manual labor. In industry, weaving companies in England began to replace human labor with steam engines. This change marked the beginning of industrial revolution 1.0, where human labor was replaced by machine power.

The next advancement came in 1831, when Michael Faraday, an English scientist, discovered that electricity could be generated through the flow of magnetism near a copper wire. This discovery of electricity paved the way for many factories in England to replace their energy source with electricity, increasing production efficiency. Another revolutionary innovation was Henry Ford's use of conveyor belts, which allowed car production costs to be much lower than other factories. This strategy made Ford the world automobile market leader of its time. This

development marked the transition to industrial revolution 2.0, which was characterized by the use of electricity and mechanization in the production process.

Revolution 3.0 is characterized by the development of information and electronic technologies that enable the implementation of automation systems in the production process. The use of computers and automation became the main characteristics of this era, which significantly improved industrial efficiency and productivity. Meanwhile, the industrial revolution 4.0 began in 2000, characterized by the ability to manage and utilize large amounts of data. This revolution has its roots in Germany, particularly at the Hannover Trade Fair, and is characterized by the development of the Internet of Things (IoT) and Artificial Intelligence (AI). From the pre-historic era to the modern era, technology continues to play an important role in shaping the way humans perceive the world, both in understanding reality and in living their daily lives. (Najoan, 2022).

A technological revolution is the replacement of one set of technologies with another. Generations are defined as humans who live and are born at about the same time. Humans who share the same biological and physiological characteristics. From the agricultural revolution to the printing revolution and the information revolution. The human race has not changed anatomically, biologically, or physiologically. (Dufour, 2017).

Technological development has brought profound changes to the meaning of human life. In response to the accelerated transformation brought about by industry 4.0, Shinzo Abe, former prime minister of Japan, introduced the vision of society 5.0 at the world economic forum in Davos, Switzerland. Society 5.0 refers to the concept of a super-smart society that seeks to create a balance between technological advancement and economic needs to address various social issues. This is achieved through the integration of virtual and physical systems. (Shiroishi et al., 2018). The main goal of society 5.0 is to build a humanity-oriented society by combining economic growth and solving social problems. In this concept, the

challenges facing society are expected to be solved effectively, so that each individual can enjoy a more active, comfortable and inclusive quality of life. Technology in society 5.0 plays a role in forming a super-smart society that is able to use technological innovation to solve various problems efficiently and sustainably.

C. Singularity as the End of Civilization

Along with the rapid advances in the development of artificial intelligence (AI) come a variety of technical and ethical challenges that need to be addressed to ensure that this technology can be used safely and effectively. One of the biggest challenges faced by AI researchers and developers is the problem of misalignment between the goals desired by humans and the way AI systems achieve them. This problem is becoming increasingly important as AI has the potential to transform many sectors of life, from the economy to human safety.

Misalignment can occur at various levels. At a lower level, misalignment may relate to errors in programming or algorithm design, where the AI system does not correctly understand what is desired. However, at a higher level, misalignment can result from fundamental differences between the way AI and humans understand or formulate goals. For example, if an AI is given the task of maximizing energy production, it may look for effective ways to harm the environment, as it is not programmed to consider the ecological or social impacts of its actions.

One of the main causes of misalignment is ambiguity or vagueness in goal setting. For example, commands such as "help humans" or "optimize human well-being" may be too broad or ambiguous, so the AI may choose a path of achievement that does not match human expectations. In machine learning, especially in more advanced types of algorithms such as deep learning, AI can learn from large amounts of data without direct human supervision. If the data used to train the system contains bias or unwanted information, AI may develop strategies or patterns that are not in line with the original human goals.

On the other hand, unequal access to technology remains a major issue that raises the potential for dystopia, a social condition characterized by inequality and mass suffering due to unequal technological sophistication. The factors contributing to this inequality are diverse, ranging from the unequal distribution of infrastructure, the low economic ability to afford technological devices to the lack of digital skills among a large portion of the population, especially in rural areas and developing countries.

This inequality of access leads to increasingly sharp social polarization. Those with access to technology will continue to thrive and benefit from innovations, while those who are marginalized will become increasingly isolated, whether in education, employment or social life. This creates what is referred to as the "digital divide", a widening gap between the advantaged and disadvantaged groups of society.

One of the potential dystopias that can arise due to unequal access to technology is the strengthening of the power of technological oligarchs. Large companies that control advanced technology, such as Google, Facebook, Amazon, and others, have the potential to further widen the social gap by controlling information, data, and markets. Those who control these technologies not only have economic advantages, but can also manipulate public opinion, control government policies, and reduce the access of small communities to basic services. In this scenario, technological sophistication, which is supposed to democratize life, creates greater injustice.

IV. CONCLUSION AND SUGGESTIONS

A. Conclusion

The technological singularity represents a critical juncture in human civilization where artificial intelligence surpasses human intelligence, bringing both opportunities and challenges. As demonstrated through this analysis, singularity has the potential to serve as a new beginning through the integration of technology and human values, as exemplified in the Society 5.0 concept, which aims to balance technological advancement with social welfare. However, significant challenges such as goal misalignment

between humans and AI, algorithmic bias, and unequal access to technology could lead to social dystopia if not properly addressed. The future impact of singularity on human civilization will largely depend on how effectively we manage these technological developments, emphasizing the need for balanced policies that promote sustainability, human well-being, and social justice in the era of technological singularity.

B. Suggestion

To address the challenges and opportunities of technological singularity, it is essential to establish comprehensive regulatory frameworks at both national and international levels while ensuring ethical considerations remain paramount. Educational institutions should prioritize digital literacy and AI education, while programs should be implemented to guarantee equitable access to technology across different social groups. Additionally, increased funding should be allocated for research on AI safety and alignment, with emphasis on fostering public dialogue and transparency in AI development to maintain human values and social welfare at its core.

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