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Review

Society 5.0: A Japanese Concept for a Superintelligent Society

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Abstract: This document discusses the Japanese context of Society 5.0. Based on a society-centered approach, Society 5.0 seeks to take advantage of technological advances to finally solve the problems that currently threaten Japan, such as aging, birth rates and lack of competitiveness, among others. Additionally, another objective is to contribute to the progress of the country and develop the foundations for a better world, in which no individual can be excluded from the technological advances of our current society, to achieve this goal, the Sustainable Development Goals (SDG) have been developed. SDGs seek to assess the methods of use of modern technology and thus find the best strategies and tools to use it in a way that guarantees sustainability within the framework of a new society that demands constant renovations.

Keywords: society; sustainability; big data; artificial intelligence; cloud computing

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1. Introduction

In January 2016, the Japanese Government disseminated information on the Fifth Basic Plan for Science and Technology (2016–2020). The initiative is called "Society 5.0", and it seeks to create a sustainable society and contributes to the safety and comfort of individuals based on a specific cyberphysical system [1,2]. Society 5.0 defines a system of systems. In it, several systems (such as energy management and highway transportation systems, among others) are connected on the Internet for the mitigation of both local and global social problems (such as the reduction of carbon emissions).

The concept of Society 5.0 aims at solving social issues from a new perspective. In this new era, different aspects would be connected and technologies would join a superintelligent society with full integration from big data, the Internet of Things (IoT), artificial intelligence (AI), and people services to facilitate digital and physical infrastructures for human beings. The objective hereof is the establishment of societal foundations where anyone can develop value, at any time and place, in a safe environment and according to natural environments, without any limitations such as those that currently exist [3].

Society 5.0 defines a system of systems (such as energy management and road transport systems, among others) that connect to the Internet for the mitigation of both local and global social problems (such as the reduction of carbon emissions). This new concept of society aims to focus on the human to balance the deployment of Big Data Technologies, the Internet of Things, and Artificial Intelligence with the resolution of major problems of society such as: competitiveness, productivity, connection and wellbeing All these on the basis of achieving the maximization of human use of the ongoing technological transformation, digitization.

The paper mentions key points of Society 5.0, beginning with the description of the four revolutions of society and industry focused on the change generated at different levels of society and industrialization to achieve the objectives proposed by Society 5.0. In addition, the political perspective that involves governments and citizens is addressed,

considering the importance of sustainability to achieve a better quality of life. Through the use of cyberspace and physical spaces with the implementation of IoT, big data, and AI, an infrastructure is proposed to carry out Society 5.0.

The proposed infrastructure addresses the concept of Society 5.0 from different points of view, establishing the origin of the concept and its development in practice and measuring the scope and social consequences of its application in a global context. In this way, managers and politicians are provided with an overview of the literature and the problems found in practice.

1.1. Overview

The article presents Society 5.0 through five phases, as shown in Figure 1. The first one describes, in the second section, the beginnings of the concept of Society 5.0 through a chronology of time. Next, the third section corresponds to the implementation phase that describes the perspectives in Society 5.0 concerning social aspects, such as energy consumption and health care. In the fourth section, the implementation and impact phase shows Society 5.0 in different areas and also presents a relationship between Society 5.0 and sustainable innovation. The next phase, described in the fifth section, introduces the concept of Agenda 2030 and establishes its relationship with economy in Society 5.0. In the end, an objective approach is given in the Conclusions.

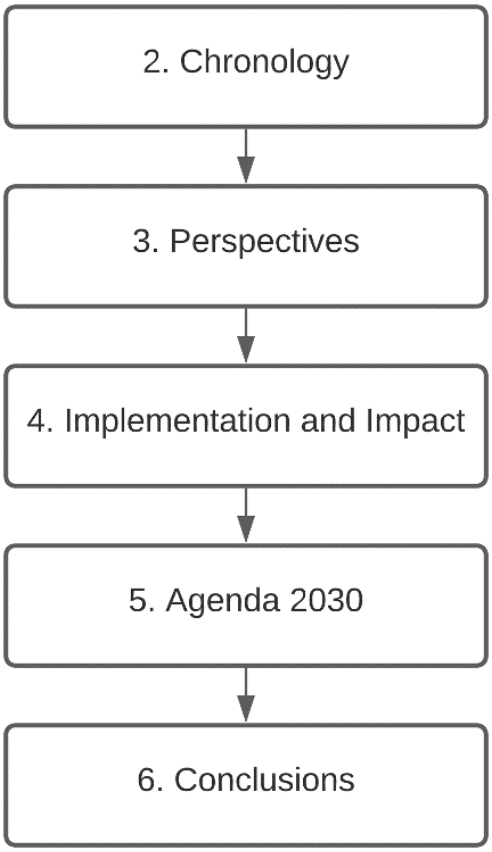

Figure 1. Article structure.

1.2. Methodology

Review articles can be classified in various categories according to the methodology used, its purpose, and its structure. In [4] there is a list with the main categories, pointing out the methodological aspects of each one: search, analysis, and synthesis. These are shown in Table 1.

Table 1. Review categories and their methods.

Review Category	Target	Evaluation	Reasoning	Examination
Critical	To charaterize relevant aspects	Quality estimation is not strict and it is according to contribution	Commonly narrative, maybe conceptual or chronological	Etablish contribution to embody or derive
Literature	Retrieving is optional	Quality assessment is elective	Commonly narrative	Study may be chronological, conceptual, thematic, etc.
Mixed studies	Exploitation of selected studies	Evaluation with checklists	Textual or graphical means of engaging studies	Correlates or identifies absent but missing aspects
Scoping	The search depends on time or scope, possible active research	Quality estimation is not strict	Commonly tabular with some commentaries	Characterizes literature by key features; attempts to specify a review
State-of-the-art	To search current literature	Quality estimation is not strict	Commonly narrative, it can have graphics	Shows current state-of-the-art and new ideas for research
Systematic search	Exhaustive search	Quality assessment is elective	Minimal narrative, tabular summary	What is known, advice for practice and constraints

Regarding this paper's structure and approach, it should be noted that it constitutes a state-of-the art review, as shown in Table 1. It also addresses the issue, contrasting the approaches of the different sources and proposing how these can guide future research on the subject. The section "Agenda 2030" addresses this topic from the sections "Perspectives" and "Implementation and Impact", and both constitute the document core as it is explained in the previous section and outlined in Figure 1. Regarding the synthesis methods, the document is structured by thematic points or sources, as needed [5].

2. Chronology

This section sets the context for its research on Society 5.0 and the industrial revolution. Therefore, the paragraphs provide an overview of the different industrial revolutions and types of societies that predated each revolution and how they have led the way to the current status. Society 5.0 and the Fourth Industrial Revolution have carried forward several features from their predecessors, either by developing them or increasing additional aspects. The five industrial revolutions are described below.

2.1. The Industrial Revolutions

Social evolution has been marked by the attainment of freedom thanks to mastering diverse technologies, abilities, and techniques. These technological and structural advances, as well as the main development leaps made by society, are classified in industrial revolutions.

Starting with the invention of the steam engine up to the implementation of AI, industrial revolutions have set the advances of humanity as a society. To clearly understand the concept of Society 5.0, a description of the industrial revolutions that took place before the Fourth Industrial Revolution is warranted [6].

2.1.1. The First Industrial Revolution

From 1780 to 1820, the First Industrial Revolution was one of the most significant social, economic, and technological transformations in human history. In this revolution, humanity underwent changes in its rural economic system from an agricultural production to a manufacturing and industrial production system. Three significant factors were

influential, i.e., inventions of machines; energy generation options, such as using steam for industrialized transportation; and forms of labor organization, such as factory workers. These innovative processes created an exponential growth of society and led to an understanding of the world in a different way with a focus on production and development techniques. Since that moment, society changed from surviving to developing and progressing.

2.1.2. The Second Industrial Revolution

The Second Industrial Revolution occurred as part of the first period of globalization, from 1870 to 1914. It was boosted by novel energy options, such as electricity and oil-generated sources, automatic machinery that manufactured parts of other machines, the development of land transportation and airplane flights, and the onset of cinema and communication systems. All of this brought about accelerated industrial and economic changes in society, creating novel organizational growth models.

Based on these new models, serialized processes substantially decreased production time and costs. This led to an increased internationalization of the economy and made a big impact on society. The use of electricity accelerated communication and transportation processes but increased unemployment due to the replacement of employees by machinery.

2.1.3. The Third Industrial Revolution

The Third Industrial Revolution occurred in 1970. Its leaders were the United States, Japan, and the European Union. It is associated with the new term "Information Society". Its main feature was industry automation based on how new communication and energy technologies coalesced and complemented each other. The use of the microchip and of integrated electronic components, which replaced existing storage and communication methods, was the foundation for this new information society.

The Third Industrial Revolution has highlighted the importance of developing intelligent R&D&I policies. Such technological progress created by new information and communication technologies (ICT), such as the Internet, developed a novel societal paradigm, for which a different perception of information was required. This produced the Fourth Industrial Revolution.

2.1.4. The Fourth Industrial Revolution

In the Fourth Industrial Revolution, a wide range of new technologies for factories, was established based on sensors and information systems, whose goal was the adaptation and the development of personalized client services. Its goal was to design and develop subsequent transitions and adaptations of new information systems based on modern digital revolution infrastructures in a shorter time.

The Fourth Industrial Revolution is based on several productive axes considering big data, robotics, IoT, cloud computing, and augmented reality, inter alia, for complete manufacturing automation. In this way, emerging technologies of the Fourth Industrial Revolution directly impacted society by generating new ways to move and communicate, creating value, and distributing opportunities.

The historical description of several industrial revolutions denotes how, in the first three industrial revolutions, the process went from mechanization and the steam engine to assembly line production, power, automation, and vehicles. Industry 4.0 was marked by the velocity of disruptive changes of cyberphysical systems, smart industry, automatic knowledge, deep knowledge, big data, and IoT [7,8]. In a direct manner, the development of the different industrial revolutions is related to the concept of Society 5.0 [9]. In this chronological period in the history of humankind, future technological advances are restated and led by an approach whose goal is the well-being of all individuals [10,11].

Changes in society are defined by cultural level, economy, politics, and communication. Societies are determined by context and depend on the development of each region; on

the other hand, industrial revolutions are mainly framed in technological and industrial changes, which characterize the type of revolution that the country or region is facing.

During the transition from one society to another, changes occur at all social levels; for this reason, societal change is generally subsequent to industrial revolutions, as is shown in Figure 2.

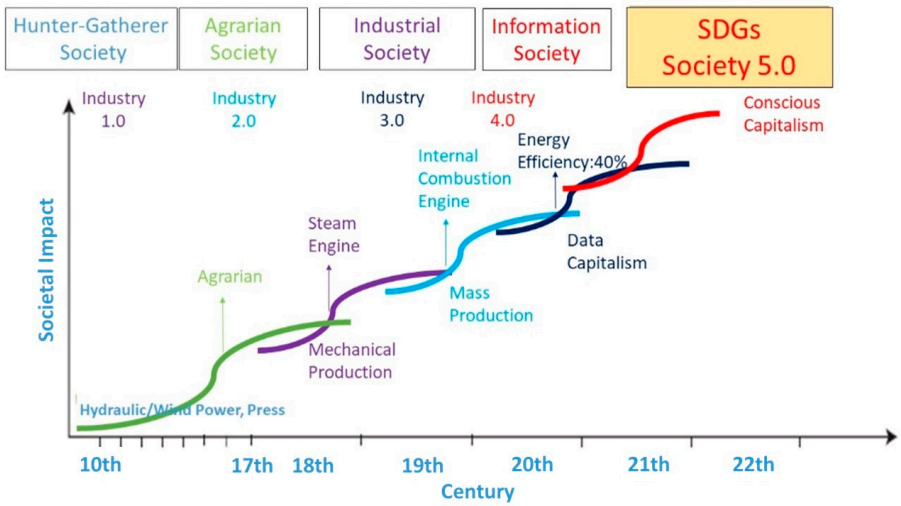

Figure 2. The relationship between innovations based on science, technologies, and changes in society.

The figure above illustrates how industrial revolutions overlap and indicates the main technological advances that cause society change.

After the four previous societies, Society 5.0 arises, which is focused on the understanding of this new reality and its social approach. Within this context, a tour of the diverse types of society that preceded Society 5.0 is also required.

These periods of industrialization not only had a great economic impact, but they also generated enormous social transformations due to the substitution of a class society based on feudalism by a class society determined by material goods. The different stages of industrialization reinforced global urbanization, and as a consequence of industrialization, the entrepreneurship sector obtained great wealth by selling their products and paying low prices for labor power. In this way, each of the industrial revolutions represented a substantial impact in the categorization of the five societies contemplated by the concept of Society 5.0.

2.1.5. Society 1.0: The Hunting and Gathering Society

The first society was led by nomads, who were in charge of food gathering and hunting. They constructed provisional shelters and did not live a full year at the same location. Nomads roamed in specific territories already known to them where they could live, and their only goal was to find food. This complicated their survival difficulty because they relied on finding available food sources.

This was a society with a nonproductive economy. They spent time hunting and gathering pieces of fruit, vegetables, and roots, among others. However, they were quite skilled in adapting to territories, as they stayed in groups to communicate and to help each other by sharing knowledge. Fire was important in this society because it provided protection, as it kept animals away from humans. Additionally, fire was also used as a heating, lighting, and cooking source. Furthermore, people manufactured hunting weapons and other tools from stones or bones. In this period, tasks were divided, which would mean that women gathered food and men hunted.

2.1.6. Society 2.0: The Farming Society

In this society, agriculture was discovered and developed. Hence, society was able to reach a new level of evolution. Crops and land production allowed for the formation of tribes from a larger number of previously nomadic family groups. They could now live in permanent locations near rivers where they could fish and places where they planted and harvested food. Humankind became sedentary because crops or livestock could not be transported. For this reason, society members had to build robust huts where they could now live and harvest crops all year round.

Thus, they became self-sufficient based on what they could plant, raise, or make with their own hands. The economy exploited several resources offered by the land, such as fruit, vegetables, and grains. They also began to spend time weaving and making ceramics. Eventually, they started exchanging products, a process known as bartering, between settlers. Currency did not exist, so they started to exchange any product that was available for bartering. Mostly, precious stones were exchanged, and most people made necklaces out of them.

2.1.7. Society 3.0: Industrial Society

This society corresponds to production massification, i.e., the advent of factories and machines that replaced manual labor. Additionally, the technological innovations of the time also fostered mass production, thus achieving reductions in costs and time and increasing the resources acquired to a great extent, which, in turn, increased worker salaries and income. As a result, people now started earning money that did not even exist before. The first industry was the textile industry, which was largely based on the use of coal.

This evolution significantly changed how people started to think. Social class structures also started to emerge because economic differences were defined by the material goods each person and family possessed. Additionally, in this period, people also started gaining rights.

Regarding the evolution of economics, merchandise production centered on the research of mechanisms for manufacturing products with the least possible human effort and involvement while employing advanced technology. The most evident benefits were transportation since the development of railways and steamships allowed people to travel to other places more quickly.

2.1.8. Society 4.0: Information Society

In this age, technologies simplified the use of information. This is more noticeable in social, cultural, and economic activities because they are centered on people and on interconnecting technological innovations that allow information to flow quickly and accurately all over the world.

The revolution of this society includes information access and interaction among individuals using ICTs, thanks to the preparation and distribution of information. Things and people are connected to any place in the world. For example, the Google search engine can easily be used to reply to our questions, which fosters access to knowledge. Additionally, social media keeps people informed on world events, news, or events that are happening in that precise moment.

In fact, the technological features of the information society have been strengthened by governments due to the positive effects produced on the economy. Currently, to succeed in the work market, one must possess skills related to the use of information. Currently, organizations automate industrial processes to use resources more efficiently, as in digital marketing, and thanks to these innovative methods, new clients are being acquired without requiring substantial investments.

3. Society 5.0: Perspectives

This is a society focused on human beings, who, through economic progress, are able to solve social issues with systems developed through the integration of cyberspace and

physical spaces [12]. This novel societal model focuses on the connection of the real world with the cyberworld, which was defined and evolved in the Fourth Industrial Revolution, to more effectively and efficiently solve current societal issues [3].

Based on a unified system, this new social model manages economic and social issues and directly focuses on the interests and demands of people [13]. From an organizational point of view, Society 5.0 seeks to create new methods for operating individualistic systems where companies, universities, and governments independently strive to create a collaborative operational concept boosted by current societal interconnectivity [14,15].

A sustainable society is involved in and attends to its present without compromising the opportunities of the future, thus organizing itself to improve the quality of life and autonomy of the citizens that comprise it and to aspire to the common welfare.

Sustainability is a holistic approach that considers various areas, and society is an important base among them, as seen on Figure 3.

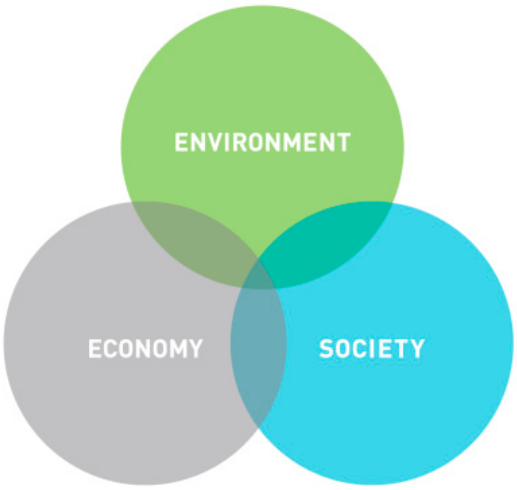

Figure 3. Three bases of sustainability [14].

The concept of Society 5.0 has been developed mainly in Japan, defining an ideal situation toward which each country should evolve to fully leverage continuous technological transformations, thus benefiting all their citizens [16].

In 2015, this concept emerged as part of the framework of the V Science and Technology Basic Plan (2016–2021). In fact, it was promoted by cabinet members of Shinzo Abe, the then-current Prime Minister, who, at the CeBIT Hannover fair in 2017, displayed this model to the world [2].

The alignment of Society 5.0 actions and objectives with the Sustainable Development Goals (SDGs) from the United Nations Development Program is defined as "a universal call for the ending of poverty [17], the protection of the planet, and to guarantee the enjoyment of peace and prosperity by all people by 2030" [18] (Figure 4).

The SDGs were planned in order to achieve collective progress between governments and citizens, thus avoiding the consequences of social inequality [17].

Since then, many countries have oriented their investment and research strategies towards a similar model [19–21], in which sustainable development is idealized from its initial planning, considering the advances in infrastructure and technology, thus achieving an improvement in industrialization and the environment [14].

The Japanese government defines the following actions to be implemented and carried out within Society 5.0 to achieve execution towards the objectives of the SDGs in the year 2030.

Figure 4. Sustainable development goals.

Cities and Regions. In Society 5.0, social processes and data must be distributed in manners that would allow for developing smarter solutions, designing living methods, and establishing a society where diversity is valued [22].

Energy. When local and decentralized power microgrids are developed, Society 5.0 will supply clean sustainable power to everyone [22].

Disaster Mitigation and Prevention. For disaster mitigation, new digital technologies will be used. Medical services will be continued even during emergencies [22].

Health Care. In preventive phases, novel health care technological developments will be available for everyone. Based on their own initiative, individuals may use and manage data associated with their health [22].

Agriculture and Food. Cutting-edge technologies will be applied to the greatest extent to optimize food value chains. The involvement of several actors will be sought, such as private-sector corporations, youth, and agricultural companies [22].

Big data, data science, and AI are essential R&D technologies that have to be accurately integrated to achieve Society 5.0 objectives [9]. These objectives are focused on the advanced merging of cyber and physical spaces. Therefore, information will be collected from several sensor types located in physical spaces and compiled through the IoT [23]. The transition from Society 4.0 to Society 5.0 is illustrated in the following figure.

Furthermore, novel technologies, such as cloud computing, IoT, and big data will require a newly updated infrastructure, as defined below.

4. Society 5.0: Implementation and Impact

4.1. IT Infrastructures

This new model of society is established in IT infrastructures [24], which include networks, cloud computing, data centers and big data incorporated into the renewed municipal infrastructures with intelligent processes of energy, water, and transport networks [21,25].

Infrastructure integration within Society 5.0 revolves around high-speed broadband connections and ubiquitous mobility; urban readiness also promotes intensive construction processes for various types of IT infrastructure [26] to create a relationship between users, IoT, big data, AI, and personalized services [7].

Sensor Networks. The information collected from several sensors is sent to central processing units, wherein it is integrated and stored in data management platforms at an intermediate level. At this level, unstructured data are stored for subsequent analysis at the top level. For these purposes, the Shiojiri-Japan City Council invested in developing a network of diverse IoT sensors distributed throughout the whole region for the automatic compilation of environmental data, as can be seen on Figure 5. This network is also used to exchange data from other organizations interested in benefiting the local population.

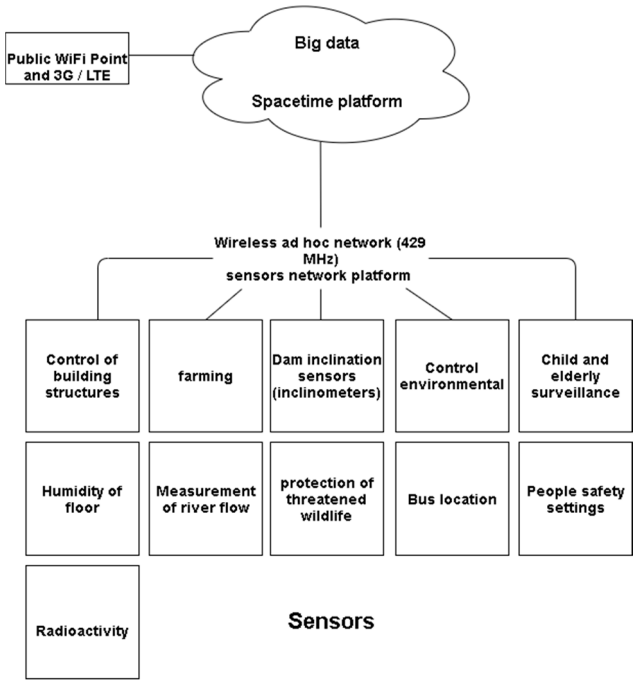

Figure 5. Diagram for the Shiojiri Environmental Data Compilation Platform and its sensor Internet of Things network.

IoT (Internet of Things). As part of IoT, everything connected to the Internet features enhanced technologies that identify accurate data from the physical world, facilitate the compilation of appropriate data in real time, and send these data to cyberspace [27].

Big Data. The name refers to a large amount of data, which cannot be traditionally analyzed because it is composed of structured and unstructured data. With the IoT, Society 5.0 has created a need for implementing additional storage techniques due to new data volumes attained [28]. Big data is the set of techniques that can be used to compile and process large quantities of data and conduct their immediate analysis through data science. This generates additional value related to the information society [29].

AI (Artificial Intelligence). On data included and managed through IoT and big data, several analysis techniques are applied for monitoring and acquiring information. In this light, AI is also used to facilitate decision-making processes for managing a large number of resources and, consequently, guaranteeing safety in urban areas [30].

In 1960, AI capabilities were initially proposed, and they have been researched since that year. In fact, these capacities have rapidly and recently improved because of the invention of deep learning. AI has the ability to analyze complex recognition patterns, predict behavior, and accurately execute operations of physical systems. Its goals are to make decisions and solve overly complex problems, provided it is correctly designed and executed.

Even when AI automates many human tasks, it is not considered a problem for the new society, since the output generated by robotics and AI must, at all times, be under human direction.

Individual-Oriented Services. Individual-oriented services are evidenced in several areas, such as energy, food, health care, local regional infrastructure, climate change, and disaster prevention/reduction [19].

Nevertheless, the superintelligent society does not establish its operations in individual sectors, as it traverses many fields and has impacts on different behaviors, cultures, and societal patterns, among others.

4.2. Health

Japan is an aging society and, in 2065, individuals aged 65 and over will account for 38.4% of its total population. This will generate a substantial reduction in the workforce while increasing the costs of health care and social security. According to the National Federation of Medical Insurance Companies, Japan's health care expenses will increase from JPY 41.3 trillion in 2016 to 57.8 trillion in 2025. This translates to an aging society with an excessively high cost of living.

Population aging is a critical issue discussed at a global scale. For the first time in history, aging is drastically growing, since the population over 65 years of age will be increasing drastically in subsequent years over the population of children aged under 5, which denotes a steep decrease in birth rates. By 2050, the population of senior citizens will triple and will continue to increase, as seen in Figure 6.

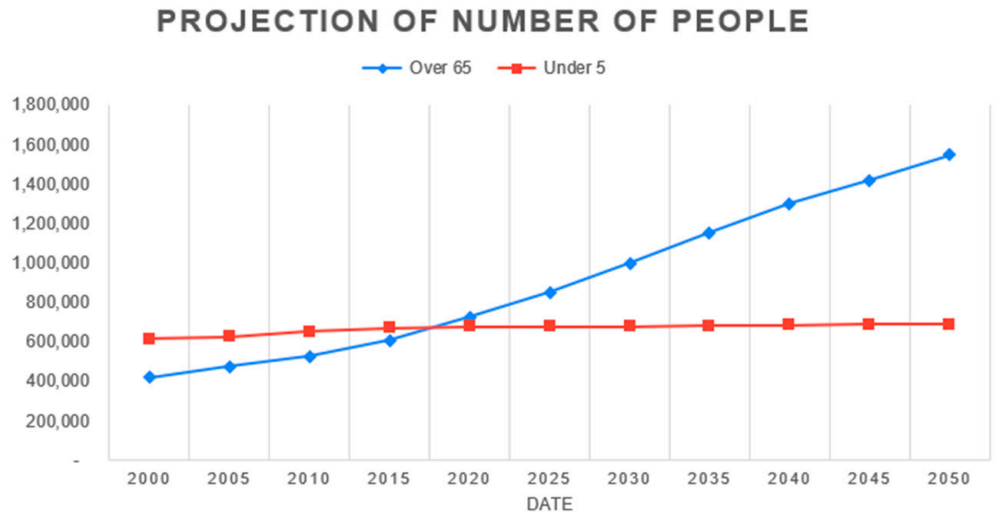

Figure 6. Population projections for the year 2050.

This issue occurs not only in Japanese society. In fact, several other countries already report an increasing percentage of their aging population throughout 2050. This might mean that an older population would impair the business sector, affecting employment rates as opposed to several other countries where the working-age population is larger.

In digital health care, Society 5.0 presents an alternative perspective, wherein technology provides support and improves health care medical systems to guarantee a good quality of life. Through the implementation of technology, data insights may be used to forecast and prevent diseases based on immediate and remote health care services [31].

Countries such as India and the United States have decided to store medical data in the cloud to better monitor their population's current health status. They collect information on patients using a data registration process, and each patient's medical history is saved and stored in the cloud, thus securing better health care for each person. For example, people suffering from hypertension will now wear a blood pressure bracelet. With this tool, the current medical status of each patient can be determined, and patient data will be immediately sent to their doctor [19].

4.3. Education

In recent years, education has been influenced by new Society 5.0 technologies, prompting critical structural changes. Classroom face-to-face teaching is no longer essential or necessary. Modern Society 5.0 technologies have fostered digital teaching with videoconferencing and virtual reality tools, thus reaching more students simultaneously without physical classroom constraints.

A comprehensive educational system at different levels is needed, and professionals are required to develop and acquire skills related to data management and processing. For these purposes, the educational Society 5.0 system promotes the design of training processes that facilitate the development of competencies not only for work but also for the consumption of culture, adaptation to continuously changing environments, ownership of basic concepts, and interaction with our environment and with others, along with social and personal development.

Universities must recognize their social function not only as trainers but also as creators of new knowledge [32]. When using this new educational model, initiatives must also be implemented to allow connections among diverse ecosystems for the attainment of the greater added value of products and services. Partnerships established with industry, academia, and the government will have a more significant impact on the knowledge generated, as well as their sense of ownership in accordance with the requirements and problems of the production sector and society in general. There will also be greater mobility of researchers between organizations, industries, and disciplines. Hence, based on the novel educational model proposed by Society 5.0, collaboration between universities and business must be encouraged to generate knowledge because, as seen in the following chart, there is still a large production gap between both sectors in Latin America compared to the United States or Europe.

In Germany, the IoT is applied to convert education to digital formats, exhibiting a substantial change when applying the IoT in several educational institutions for fostering distance learning and attaining a technological vision of privacy [7].

4.4. Manufacturing

In China, Industry 4.0 established the foundation for a manufacturing strategic plan called "Made in China 2025". This concept promotes technological advances with a global focus [33], wherein Chinese products may meet the innovation objectives at a national and international level by establishing higher priorities for new technologies [34].

Additionally, Japan has rerouted its efforts with an increased holistic vision of technology [35]. The three objectives proposed by the country of Japan, along with the industrial objectives of creating enhanced social benefits coupled with digital and physical spheres for better social well-being, are as follows:

1. To provide essential products and services, in sufficient quantities, as required by people whenever they require them.
2. To respond to diverse social obligations aimed at providing enhanced quality services to all humanity.
3. To generate environments for an active and enjoyable life.

The manufacturing sphere of Society 5.0 generates an environment wherein there is movement among industries and small and medium-sized enterprises (SMEs), which account for 90% of all companies at a global level, to create a sustainable world with an improved quality of life and social well-being. The role SMEs play in the market is to generate diversity and innovation as required by the population.

4.5. Sustainable Innovation

During the development process of Society 5.0, sustainable innovation is considered a fundamental concept.

Sustainable innovation is understood as a process where sustainable environmental, social, and financial considerations are integrated into organizational systems.

Such integration is generated from ideas to R&D and the subsequent commercialization of results.

Those results are products, services, technologies, and new business and organizational models.

Sustainability is a key concept for the innovation processes presented by Society 5.0 due to its deep relevance in economic, social, and environmental dimensions. In the economic context, sustainability is related to profit, with problems of economic growth, the efficient use of resources, and the financial viability of commercial enterprises. In the environmental context, it focuses on the fight against pollution and the efficiency and appropriate use of natural resources. In a social context, sustainability refers to issues such as equality of opportunities, justice in the distribution of wealth, ethical behavior, equity, and impartiality. In this way, it seeks to achieve a more competitive economy, which generates sustainable economic growth with more and better jobs and social cohesion, leading to sustainable and inclusive growth.

4.6. Digital Transformation

The model proposed by Society 5.0 has a number of changes that offer opportunities to create new systems and processes. Those are technological, economic, geopolitical, and mental changes.

Digital transformation will drastically alter many aspects of society, including private life, public administration, industrial structure, and employment, through the use of cyber spaces and their integration into physical spaces.

Physical spaces and cyberspace integration is achieved by means of the fact that the large amount of information (big data) produced by sensors in physical spaces is accumulated in cyberspace. Big data is then analyzed through artificial intelligence tools (AI), and in the end, the results are presented to users in different ways in physical spaces through audiovisual devices, such as screens or speakers.

4.7. Model Disadvantages

In the new model of Society 5.0, digitization will be in many innovation processes in which sustainability is present at various levels. However, to implement this model, some disadvantages must be considered:

(1) Society 5.0 implementation, at a global level, is the technological leap from 4G to 5G. This process is complex and requires significant improvements to avoid computer scientist attacks [36].
(2) The digital evolution proposed in Society 5.0 is closely linked with IoT technologies; in this way, there is an exponential increase in the volume of important data of companies and human beings that can be affected by hackers [33].
(3) Cobot implementation in industrial processes leads to a decrease in the number of workers and an increase in the salary of specialized staff [37].
(4) Technology must be changed and hardware becomes obsolete, generating environmental pollution over the time [38].

Therefore, it should be noted that in Japan, these disadvantages were prevented, and despite of the difficulties that this may bring, the implementation of the model is worth it. Most of the evaluated aspects of Society 5.0 are intended to take full advantage of the technological transformations and thus improve living conditions and achieve sustainable development.

5. Economy and Agenda 2030

As of 1968, the Japanese economy has undergone changes in its internal structure, positioning Japan as the first industrialized Asian power. Nevertheless, in the past decade, due to several socioeconomic problems, the Japanese economy has been growing at a rate lower than 1%, since the 1990s, with a debt representing 230% of the country's national GDP.

Due to the aging of society, in 50 years, Japan will lose one third of its population. Based on the development the Society 5.0 social model, Japan is taking control measures over the population in response to these socioeconomic issues.

Several Japanese ministries have adjusted their control policies under Society 5.0 [39]. For example, the Ministry of Economy, Trade, and Industry developed the concept of connected industries, defined as "achievements, challenges and the next steps in terms of using the IoT in manufacturing processes in the country" [3].

This concept is boosting a new direction for manufacturing with a Society 5.0-focused approach, specifically with the contribution of new values generated by diverse connections.

These associations are: things with other things, people with machines, organizations with organizations, people with other people, the dissemination of knowledge and development, suppliers with clients, large organizations with SMEs, different field and industries with digital technologies, and different ways of collaboration.

Many focuses are redirected thanks to implementing the superintelligent society. Keidanren (the Japan Business Federation) published a paper, in 2016, with instructions on how to address the challenges listed for breaking five walls [40]. They are listed below.

The Wall of Ministries and Agencies (Public Administration). The representation of national tactics is required along with the inclusion of a government support system.

Technologies involved in Society 5.0, which will shape the next smart societies, will allow for a connection between citizens and key decision makers; this will increase the participation of other actors and, finally, will have an effect on decisions related to sustainability [41].

The Wall of the Legal System. Laws must be passed for the implementation of advanced techniques. In practice, this would require regulatory reforms and the development of a digital government that can take advantage of the communication technologies involved in Society 5.0 and allow for the closer participation of citizens in the proposal and approval of laws that involve sustainable practices [41].

The Wall of Technologies. The document described common commitments with fundamental roles for all technologies or areas to secure and implement them, from cybersecurity to nanotechnology, robotics, and biological and systems technology [42].

The impact analysis of Industry 4.0 on a local context was done on [43] according the UN's Sustainable Development Goals (SDGs) in some developing countries, and it was found, by comparison, that the impact is greater in developed countries, in part caused by competitiveness dynamics involving technological advances [44].

The SDGs are the continuity of the 8 UNDP Millennium Development Goals, which were the result of the 2000 Millennium Summit. The SDGs are a plan that was carried out to meet the present needs without negatively affecting future generations.

Countries have decided to achieve the 17 goals by 2030; this action plan includes people, the environment, and prosperity.

The SDGs emerge for the eradication of poverty and to combat climate change. Through sustainable development, the necessary transformations are accomplished to create a more inclusive and developed world, connecting the environment and technology.

The idea is that each country would be more sustainable through actions of good social policies, decent work, inclusion, and equality; this provides political coherence to adopt the issues in a more transversal way.

The Wall of Human Resources. Educational innovations and training in IT, as well as specializations in advanced digital abilities, are essential.

Technological innovation, as one of the bases of Society 5.0, can leverage key features, such as digital convergence, reduction in the costs of communication and information, and the growth of international networking, with the implied impact in sustainability [22].

The Wall of Social Acceptance. This is a wall based on social agreement and an exploration of social consequences along with the ethical behavior of Society 5.0 [45]. Some of the policies adopted by the Society 5.0 involve key sectors, such as energy, healthcare,

and public service, among others, that impact the population in a broader context and are determined based on social agreement [46].

The 2030 Agenda adopted in 2015 by the United Nations states and members considered that the most pressing current global challenge is the elimination of poverty. Therefore, it proposed 17 objectives with 169 essential goals, considering that several categories imply economic, social, and environmental changes [47,48]. Japan envisioned that many other countries would face the same problems, which is the reason for promoting the implementation of Society 5.0 in all countries. They declare that Society 5.0 contributes to implementing the SDGs of the 2030 Agenda. To achieve these development objectives under Society 5.0, each region must refocus its processes based on these new approaches [23].

6. Conclusions

After exploring the main aspects of Society 5.0, the importance of the direction under a sustainability approach in global projects beginning with their planning was established.

Based on technology that merges physical spaces with cyberspace, according to the new Society 5.0 paradigm, leading-edge technologies, such as the IoT, big data, and AI, are related. Therefore, sensor networks are used to compile large amounts of data and store them optimally through big data. These data are processed by AI algorithms for data analysis to extract information and to generate value from such data. In this way, custom services are created for anyone, anywhere, anytime. Evidence of the power and flexibility of Society 5.0 is demonstrated offering equitable solutions to the needs of each person.

Society 5.0 is centered on human beings at the core of transformations together with economic growth, technological development, and sustainability. This novel society model is based on the fact that humanity is accessing the fifth social revolution. From the analysis, it was seen that Society 5.0, thanks to its approach, allows for the development of sustainable technology without limiting prosperity.

Advances of this novel societal concept are highlighted along with their influence on educational techniques and scenarios [49]; the inclusion of virtual systems and new work models; their impact on health care [50]; changes produced for the future of manufacturing, including SMEs, to develop a sustainable world; and the financial and research investments made by several countries.

This document offers a contribution to understand the concept, structure, and impact of the implementation of Society 5.0 with a sustainability approach. Society 5.0 proposes that through sustainable digital innovation, the challenges of modern society are faced to increase the potential of the individual–technology relationship in order to promote the improvement of people's quality of life through a superintelligent society—Society 5.0.

Features are discussed seeking to meet the custom needs of individuals, taking into account the social and ethical obligations of the digital technology paradigm. Consequently, it can be concluded that to achieve the objectives of this super society, humanity is redirecting projects to advance towards an era of industrial and social advances.

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