

Towards a New Societal Paradigm: The Components, Challenges, and Opportunities of Society 5.0

Salih Gülen¹, İsmail Dönmez² Şahin İdil³,

ABSTRACT

Editorial

Article History

Received: 4 May. 2024

Received in revised form:

7 May. 2024

Accepted: 12 May 2024

Published: 30 Jun 2024

Keywords: Society 5.0, artificial intelligence, sustainable development, digital transformation

The research deals with the social evolution of mankind in the historical process and the concept of "Society 5.0", which has recently come to the fore in this evolution. Starting from hunter-gatherer society in the history of mankind, it has passed through the stages of agriculture, industry and information society, and today, with technological advances, a new phase called "Society 5.0" has been transitioned. Society 5.0 is a model of society, especially developed under the leadership of Japan, in which technologies such as artificial intelligence, big data and the Internet of Things are integrated to improve human life. The research examines in detail the reasons, elements, concerns and achievements of this new society model, while emphasising the sustainable development goals.

¹ Assoc. Prof. Dr, Mus Alparslan University, Child Development Department, s.gulen@alparslan.edu.tr, 0000-0001-5092-0495

³Assoc. Prof. Dr, Mus Alparslan University, Child Development Department, i.donmez@alparslan.edu.tr , 0000-0002-7792-0169

³Assoc. Prof. Dr., The Scientific and Technological Research Council of Türkiye, Türkiye, sahinidin23@gmail.com , 0000-0003-2366-913X

Reasons, Elements, Concerns and Gains of Society 5.0

Society 5.0

Mankind has been in a very rapid change since its earliest times. It has undergone great changes from hunter-gatherer, nomadic life to the present day. From tent houses to modern buildings, from hunting and nomadic life to settled and production-based life, from field-straw to tractor-factory, it has made a breakthrough in innovations in its life with the introduction of the internet after the 2000s (Çipi et. al., 2023). There are groundbreaking changes such as moving libraries to homes with the Internet, the use of smart items with the Internet of Things, and the acquisition of artificial homes, spouses, friends and families with artificial intelligence, and in this framework, it tries to gain a place in the metaverse universe by virtualising the world it lives on.

The change of society with the development of technology and science is an inevitable end. In general terms, it can be said that society has reached to version 5.0 starting from 1.0 with its conceptual nomenclature. The following chart summarises the process of social change.

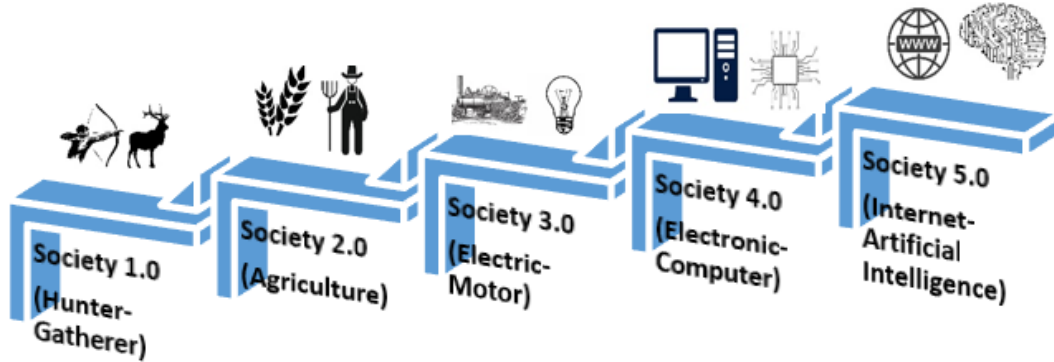


Figure 1. Stages of historical transformation of society

Figure 1 summarises the current state of the society in its earliest form. This chart is inspired by studies such as Arı (2021), Information and Communication Technologies Authority (ICTA) (2021), Eren, (2020), Yetkin and Coşkun (2021), Huang et al., (2022). Below, information about the historical transformation stages of society is given.

Society 1.0 (Hunter-gatherer society): It is the social life of the first years of humanity, the struggle for life, the struggle to feed and temporary accommodation periods. In this period, human beings tend to live integrated with nature (without using resources) and are in the fight for survival.

Society 2.0 (Agricultural society): It is the period when human beings started to use the land with irrigation techniques by switching to settled life. It is the period of forming complex communities and statehood with agricultural production. It is estimated to have started thirteen thousand BC.

Society 3.0 (Industrial society): It is the social structure that started with the formation of industrial periods. It is the society that matured with the first industrial revolutions in the 1800s and the operation of steam mechanics (Industry 1.0) and the spread of mass production with electric and combustion engines in the 1900s (Industry 2.0).

Society 4.0 (Information society): The social difference that started in the 1970s refers to the society in which knowledge and reason are prioritised. It is the society in which the use of electronic and information technologies has increased after the discovery and use of the computer, and production has advanced to an advanced level with automation and robotisation initiatives with the internet (Industry 3.0). Industry 4.0, which is at the forefront of the development of today's society, where the use of digital products, smart production with the Internet of Things, the use of three-dimensional printers, robotics and space technologies supported products are obtained, is also considered within this society.

Society 5.0 (Artificial human): Although this concept first emerged in Japan, it targets the society after the 2030s (Eren, 2020; Yetkin & Coşkun, 2021). First of all, the concept of "artificial human" proposed for society 5.0 should be emphasised. This concept is used consciously by researchers. This concept is not meant to draw attention to the production of artificial human beings or to imply such a situation. As a matter of fact, this concept may have been suggested due to the possibility of such a situation in the coming years with the development of technology. However, this concept, together with the development of artificial intelligence and the Internet of Things, the placement of artificial intelligence in vehicles that facilitate people's daily work, its placement in every home and every family for various reasons, the production of virtual worlds (Metaverse), the realisation of some activities and organisations in these environments, and the fact that life seems to be invaded by the Internet and artificial intelligence, creates the idea that human life is artificialised (the activities that should be done instead of being done for various reasons and making life easier). For these reasons, the concept of "artificial human" is used. However, it is seen that concepts such as "super smart society", "digital society" and "creative society" are attributed in the literature. The main purpose of using these concepts is the definition made by the prime minister of Japan at the time. According to this definition, digitalisation is a philosophical movement that aims to ensure the efficient interaction of people with machines and robots in accordance with their demographic, economic and sociological structures (Ari, 2021; Moradi et al., 2023).

Although Japan experienced a crisis in terms of innovation in the 1990s, it changed its innovation system in order to make a modelling like Silicon Valley and made important studies especially in the fields of biotechnology and information communication technologies with university-private sector cooperation with an entrepreneurial spirit. Nevertheless, there are still thoughts that there is an innovation crisis. For this reason, Japan has put forward the concept of Society 5.0 in order to establish a link between the social needs of society and technological

developments (Lechevalier, 2024). In general, Japan has set a path towards a nationwide social-technological integration with large financial support and has set an example for the rest of the world. It is also believed that it can have these community-centred innovations (Holroyd, 2022). Japan has implemented 229 smart city projects within the scope of Society 5.0. For example, Maebashi city, where all citizens over the age of 65 are transported by public transport (driverless), is one of these cities. In addition, with bilateral co-operation, cities of other countries, especially the USA, are twinned with each other and similar works are made widespread. In these cities, roads, bridges, tunnels are equipped with smart devices or sensors and measures are taken to prevent serious accidents or injuries by early diagnosis and diagnosis in terms of construction and repair. In addition, interest in autonomous driving is seen to provide great convenience to the elderly population and economy in Japan. This situation also shows that policy makers exhibit a common understanding within the scope of Society 5.0 and progress in improving technology. (Yamasaki, 2024). There are also exemplary applications in the field of health within the scope of Society 5.0. For example, with wearable technology, the health status of the individual is monitored thanks to the sensors integrated into the watch on the arm, ring on the finger or wristband of the individual, and early diagnosis and treatment can be provided with a warning in the most important problem. In another application in the banking sector, banks now serve with digital customer services by opening branches in certain areas and strengthening mobile applications and virtual transactions rather than opening a branch in every province and district (Ari, 2021; BTK, 2021). It is a philosophy that emerged with similarities in the dimension of values and organisations by using the benefits of Industry 5.0 by offering opportunities such as the use of digital objects that can work like humans to prevent risks and accidents in the industry (human's digital twin), providing solutions to society and industry problems with renewable energy sources in order to ensure sustainability (green smart production), and business and professional lives that will change with the developing technology and its integration (Huang et al., (2022). In addition to all these, in the field of education, Turkey has switched from a huge file system containing personnel and student information to virtual platforms such as e-school and MEBBİS. Digital Turkey roadmap, digital literacy course taught in universities, Education Information Network (EIN), Smart intersection, can be considered as the preparatory steps for Society 5.0 (BTK, 2021).

With Society 5.0, it is aimed to get rid of daily muscular labour (BTK, 2021). As a matter of fact, super smart societies have to treat technology as innovations that work for the benefit of society, not as a threat. With Industry 5.0, a collaborative relationship between super smart machines and humans, a fair and sustainable society is envisaged (Coelho et. al., 2023). While previous industrialisation activities were based on technological developments, Industry 5.0 is human-oriented. As a matter of fact, global climate changes, epidemics, migrations and wars require this (Golovianko et. al., 2023). Therefore, it is considered as an intelligent society in which information and communication technologies are fully used, human-centred values are shared and a sustainable future understanding prevails with an egalitarian approach (Eren, 2020).

Causes of Society 5.0

It is seen that various reasons and developments are effective in the formation of Society 5.0 targets. Sustainable development goals: In addition to some of the basic topics mentioned below, to produce solutions for the rapidly aging world population, especially in Europe. The transition of the economy from Europe to Asia, the necessity of integrating virtual technologies with real life and using them for the benefit of society (Arı, 2021), eliminating ecological problems such as climate change, natural disasters and environmental pollution (Büyükgöze & Dereli, 2019; Eren, 2020), equal and fair distribution of income, including disadvantaged groups such as children, the elderly, minorities, and eliminating gender-based inequalities (Arı, 2021; Eren, 2020), the United Nations published a 17-article manifesto with 3 titles under the name of "Sustainable Development Goals" in 2015, and their recommendations for their acceptance and enactment on behalf of the sustainability of future generations have been effective in laying the foundations of Society 5.0 has been effective in laying the foundations.



Figure 2. Sustainable Goals (<https://turkiye.un.org/tr/sdgs>)

The Figure 2 shows the United Nations sustainable development goals (UN, 2024). When these goals are considered one by one;

Goal 1 End Poverty: In particular, to reduce the number of families with a daily economic income of less than \$ 1.25 by 2030, to improve at least half of those considered poor at national levels, to ensure that social protection and minimum living conditions are largely implemented. Ensure that every poor and vulnerable individual, male and female, has the right to own, manage and inherit land and property. To reduce the probability of exposure of this class of people to

disasters arising from climate and natural disasters. Finally, it aims to create strong infrastructures in the action plans of the countries so that their anti-poverty plans are robust.

Goal 2 End Hunger: By the end of 2023, it includes objectives such as ensuring access to nutritious and safe food for all, eliminating malnutrition, securing sustainable food production by increasing resilient agricultural practices, encouraging small farmers such as maintaining genetic diversity in food production, increasing equal access to land, technology and market, and utilising technology in production.

Goal 3 Healthy and Quality Life: By 2030, end under-five mortality, significantly reduce maternal mortality, combat infectious diseases and tropical epidemics, combat substance abuse and strengthen treatment, reduce road-related deaths and injuries, ensure universal access to information on sexual and reproductive health and reproduction and include it in national strategies, reduce air, water and soil pollution by chemicals and reduce deaths from them, support the development of vaccines against epidemics and non-epidemics

Goal 4 Quality Education: By 2030, guaranteeing pre-primary education and completing primary and secondary education, providing opportunities for vocational training and university education, entrepreneurship and technical training, reducing gender inequality in education, providing literacy and numeracy skills, gaining knowledge and skills on issues such as sustainability, equality, justice, world citizenship, cultural diversity, and supporting the acquisition of skills in information and communication technologies.

Goal 5 Gender Equality: The main objective is to empower women and girls, and it has been determined that societies with strong women and girls have an impact on development in all areas where they ensure economic growth. Eliminating female genital mutilation, early marriage, trafficking in women, sexual and all kinds of abuse, and ensuring equal opportunities in all areas and ensuring that they are included from politics to all levels of management.

Goal 6 Clean Water and Sanitation: By 2030, it is aimed to ensure that people of all age groups have access to clean water, to protect existing water, to recycle and increase the utilisation of water, and to ensure that every individual has access to water in a way that can meet all kinds of special needs.

Goal 7 Affordable and Clean Energy: By 2030, it is aimed to ensure access to affordable, reliable, modern energy services, increase the share of renewable energy sources in consumption, encourage investments in clean energy, and increase greenhouse gas emissions in economies with fossil fuel consumption.

Goal 8 Decent Work and Economic Growth: Increasing per capita income in underdeveloped countries by 2030, opening innovation pathways by supporting the development of technology, significantly reducing the rate of unemployed or uneducated youth, providing decent work opportunities by abolishing forced labour, providing trade and support funds.

Goal 9 Industry, Innovation and Infrastructure: Support sustainable industries with resilient infrastructures, increase research funding by supporting innovative activities.

Goal 10 Reducing Inequality: By 2030, 40 per cent of the population will have a continuous increase in income levels compared to the average, ensuring the empowerment of everyone regardless of differences such as age, gender, race, ethnicity, religion, abolishing discriminatory laws, and managing planned and safe migration policies.

Goal 11 Sustainable Cities and Communities: By the 2030s, it aims to ensure that every individual has access to safe, decent homes, improve affordable, accessible and safe public transport, protect natural and cultural heritage, plan for disaster risks, and manage waste.

Goal 12 Responsible Production and Consumption: It includes sustainable consumption, efficient use of natural resources, waste management, prevention of pollution of air, water and soil, and support for sustainable technological improvements.

Goal 13 Climate Action: It is aimed to strengthen all countries against natural disasters, to prepare national plans for climate change, to take urgent actions with partner states to combat climate change.

Goal 14 Life in Water: Protection of all water resources worldwide, taking measures against wastes, revitalising aquatic ecosystems, preventing harmful fishing practices, increasing marine technologies.

Goal 15 Life on Land: Protection of ecosystems such as forests, wetlands, mountains, drylands, ending deforestation and sustainable management of forests, protection of flora and fauna, taking measures against invasive species.

Goal 16 Peace, Justice and Strong Institutions: It aims to prevent all forms of violence, prevent child abuse, rule of law, prevent corruption and bribery, prevent black money and arms flows to a large extent, make institutions accountable and transparent, and ensure public access to information.

Goal 17 Objectives and Partnerships: It includes issues such as providing international support to countries, increasing the development shares of developed countries for other countries, encouraging the development of sound technologies in appropriate countries, providing trade and economic support between countries depending on the supply-demand situation (United Nations [UN], 2024).

When the sustainable development goals of the United Nations are examined, it is seen that some breakthroughs and regulations are targeted on a global scale. Especially the reference to the year 2030 coincides with the fact that Society 5.0 will officially start in 2030. It can be said that Society 5.0, which was put forward by Japan, was basically shaped based on these goals of the United Nations.

Artificial intelligence: Systems or machines that can repeat themselves with the data they collect by imitating human intelligence (ability-skills). It can be stated as intelligence that can offer the products and services that people want and need in the best quality, provide public or private services equally without discriminating according to people's cultural or demographic values,

help them cope with their daily problems, and strengthen general welfare (Calis Duman, 2022; Kocaman-Karođlu et al., 2020; Sharma & Gupta, 2024).

Internet of things: It can be defined as the network that enables all physical technological devices (air conditioners, TVs, computers, cameras, card readers, GPS, refrigerators, washing machines, etc.) that enter our lives to be made available for human use through software, sensors and the internet and to obtain data from them. The data received from these devices both affect the operation of each other and are recorded in the cloud system for human use when desired (Ari, 2021; Eren, 2020; BTK, 2021). It is realised by connecting the daily used vehicles to the internet by connecting to sensors and microprocessors such as sound, motion and temperature. It provides benefits in many areas from better health care to less energy consumption (van Deursen et al., 2021).

Big data: It refers to the information and data generated by people's use of smart devices. It is used to facilitate people's lives and pave the way for the development of new technologies by collecting and analysing regular habits, increasing or decreasing activities, increasing or decreasing consumption or earnings, raw and dispersed in real time (Ari, 2021; BTK, 2021; Martınez-Gutiérrez et. al., 2024).

Blockchain: With the emergence of cryptocurrencies, their use as a form of money in the virtual world and the subsequent formation of a system of transfers and distribution in the virtual environment, the concept of blockchain was born. This concept means the secure distribution of valuable assets in the internet environment (Xu & Zou, 2021).

Cloud technologies: It is a type of informatics that enables resources to be virtualised and made accessible over the internet with a flexible and dynamic storage area that people can access in any way (Ari, 2021; Kipps & Jones, 2020).

Robotic coding: Robotic coding, which has become widespread especially with STEM education, has been followed and developed with interest by students and young minds. Individuals can code according to their own needs and problem situations and integrate them into robots (Kocaman-Karođlu et al., 2020; Taniguchi et. Al., 2023).

Digital transformation: It can be said that the most radical work in digital transformation is the concept of digitalisation and metaverse. This concept shows that many jobs and transactions can be done in the virtual universe. Although it is still in the development stage and its functionality has not been fully analysed, it may create an ecosystem between producers and consumers in the future (Piccarozzi et. al., 2024).

Digital twins: It is the production of a product in a virtual environment before the actual object production of a product. In this way, waste and unnecessary costs are prevented (Martınez-Gutiérrez et. al., 2024; Kumaş & Erol, 2021). Digital twins can be made by integrating the unique values of human beings such as creativity, skills, cognition and decision-making with machines or technology. The digital twin of the human being is the counterpart of the human being that reflects multidimensional information to realise bilateral interaction between the

physical and virtual world (Wang et. al., 2024). It seems quite possible when elements such as ethical principles, integration, empowerment, design and ergonomics are taken care of (Panter et. al., 2024).

Sustainability: By moving real-world assets to the cyberspace environment, product and need trials are more profitable than production and trials. Thus, raw material conservation is increased. In addition, workplace accidents and injuries are reduced with tests and trials in digital environments instead of production trials to be carried out in workplaces. As a result, it is promising for a sustainable future to conclude studies in a digital environment with digital twins in order to prevent excess raw material consumption in production-oriented studies such as test-experiments that can be performed on humans, plants or animals and to reach faster results (Tili et al., 2023).

Elements of Society 5.0

With all these aims and reasons, it is planned that the future society will be differentiated, developed and updated in the following areas:

Houses and cities: It is planned to transition from slums to modern houses with green surroundings, to form smart cities consisting of technological modern houses and to ensure that the basic characteristics of its citizens are instantly known. For example, in the event of a natural disaster or emergency, the city manager will instantly know how many doctors, nurses or engineers there are in the community and will provide disaster control more easily. With the digitalisation of all aspects of state institutions, plans can be made with instant data analysis and sharing (basic needs analyses such as hospitals, kindergartens, schools). Smart home, smart institution and smart city structures can be created with secure digital control systems controlled by the state (Ari, 2021).

Disaster management: Emergency evacuation routes, instant damage assessment and early interventions will be facilitated by utilising the Internet of Things during natural disasters. It enables water, sewerage, natural gas maintenance repairs to be carried out faster after the disaster. It is thought that the risks of loss of life and property will be calculated and reduced to a great extent. By interpreting the data (such as location, status) accumulated through social media accounts, the natural disaster process can be managed faster and more effectively (Mandal et. Al., 2023).

Energy resources: Autonomous power centres will be established with the expansion and increased use of renewable energy sources. Especially with the collection and storage of dispersed energy production, it will be possible to prevent excessive consumption and ensure production according to the need (Hashim et. al., 2024; Sharma & Gupta, 2024).

Health: With the integration of technology and artificial intelligence, the individual will control his/her own health and the individual's health concerns will be reduced by increasing medical access opportunities. With personalised diagnosis and treatment services, diseases will be intervened before they start and their aggravation will be prevented. Research and development

activities will be expanded with adequate funding for epidemics or infectious or chronic diseases (El Khatib et. al., 2023).

Food: Remote monitoring and control of agricultural areas will be increased and instant laboratory services will be provided for all kinds of agricultural processes. With the integration of technology, working hours will be reduced and work efficiency will be increased and support will be provided for new harmless food diversification. In addition to terrestrial biological production, it is aimed to increase biodiversity by carrying out production in water. It is thought that agriculture can become popular and receive migration by becoming attractive with technological integration (Parte et. al., 2024).

Logistics: Thanks to the proliferation of the Internet of Things and global connectors, supply chains will be strengthened and features such as instant tracking will be followed up without disruptions. Most importantly, production and consumption balance will be ensured by instantly analysing supply and demand on a global scale by artificial intelligence. Unmanned air transport will come to the fore to reduce logistics volumes in urban areas and to provide comfortable and low-cost transport to mountainous or remote locations (Jamil et al., 2024). With the information integrated into the QR codes on the products (such as audio-visual), the detailed information of all stages in the cultivation of the product will eliminate health concerns and the value of the energy and labour spent in the cultivation of the product will be understood.

Data service: With the instant analysis and correct interpretation of big data with artificial intelligence applications, productions are provided according to the needs of the society and complete services are planned. As a result of artificial intelligence, it is planned to provide production according to all the characteristics of the consumer. Especially with 3D printers, on-site and instant productions can be possible (Hashim et. al., 2024; Parte et. al., 2024). Preventing wastage in all goods and services consumed by people, starting from clothing to cosmetics, will be effective in preventing excessive consumption of raw materials and protecting natural resources.

Finance: Although the possibility of the widespread use of virtual currencies in the virtualised universe is strong, it is planned to live without a material value of human life for a short life. The goal is to ensure life without money or material return or payment. This again seems possible with artificial intelligence. It is planned that life can be easily sustained by calculating the individual's life risk factors (injury-accident) and determining the minimum expenses for the productions they need and meeting them through the insurance system. It is aimed to end all money-related problems with a controller system that is guaranteed to meet the daily needs of the individual without problems such as excess money, black money, reserves with earnings-needs analyses supervised by smart and secure independent controls on a global scale (Ari, 2021; BTK, 2021; Eren, 2020; Er et al., 2021).

Concerns of Society 5.0

It can be said that there are various concerns and uncertainties about the Society 5.0 philosophy and the transition to it. As a matter of fact, these situations are explained below.

Capitalism

Is Society 5.0 the new method of capitalism? Research shows that there are concerns that Japan in particular is taking refuge in this philosophy to overcome the innovation crisis and leave other countries behind (Lechevalier, 2024; Whittaker & Nakata, 2024). Society 5.0 aims for a better society integrated with technology. Here, there is a need for a balance between what is necessary for society and what is necessary for the individual. Digital literacy or technology literacy is required to establish a relationship between society and technology and between the individual and society. Here, the individual needs to collect, analyse, make meaningful and transfer information to daily life. A serious theory and conceptualisation will be needed in this regard (Çipi et al., 2023). A balanced and inclusive planning is needed by integrating Society 5.0 with the United Nations sustainable development goals. Here, whether innovation-based individual goals or the development of companies will be emphasised. As a matter of fact, the relationship between the rates of impact on society when companies grow and the impact of individual development on society needs to be analysed. With Society 5.0, individual gains (for every member of society) should be prioritised instead of corporate gains, and welfare-based activities working for society should be prioritised instead of ruthless business and scientific activities based on competition.

Artificial Intelligence

Can artificial intelligence replace humans? Will artificial intelligence, which emerged with the logic of making people's daily life easier, cause the birth of a lazy and non-working generation? What will happen when artificial intelligence systems or objects produced for human work and operations completely undertake human work? Is there such a possibility? In general, the fact that these are included in a thousand and one questions in the head raises some concerns.

Professions

Since technological developments and artificial intelligence, which are at the basis of Society 5.0, will cause changes in business lines in many sectors, it will cause the birth of some professions in some areas, as well as the lack of need for some professional groups. It is thought that robots will work in areas such as health, education, social work, human resources, software, factory labour, driving, bank clerk, accountant, agricultural labour, customer service and law. It is expected that professions such as bank clerk, clerk, postman, postman, driver, reporter, insurer, accountant, where people are currently working are expected to disappear completely. In addition, it is expected that professions such as electricians, carpenters, plumbers, veterinarians, construction workers will always exist. Finally, professions such as artificial intelligence engineer, data scientist, software engineer, robotics engineer, energy specialist, health technology specialist, mobile application and game development specialist, digital data detective and content producer are expected to be very popular in the future.

Artificial family

The idea that artificial intelligence, the Internet of Things or robotisation entering family life with Society 5.0 will damage or change the institution of marriage is also dominant. As a matter of fact, both a biological and cultural phenomenon takes place in marriages. People can change their perspective on marriage with new technology products that they can talk at home, help with housework and relieve loneliness in a way. As a matter of fact, while the divorce rate in the world was 2 per cent in the 1970s, it increased to 5 per cent in 2008. Again in Europe, nearly half of the couples married in 2017 divorced. It is also known that the rate of having single children in Europe in 2018 was 42.4%. Looking at Turkey, according to the data of 2019, it was recorded that there was a 2.3% decrease in the marriage rate and an 8% increase in the divorce rate compared to the previous year. Finally, it has been determined that marriages are made with robots in some states such as Japan and China (Koçak, 2020).

Human X.0

Starting with Industry 1.0 and becoming 4.0 and 5.0, concepts have emerged up to Society 1.0 and 5.0. After 2030, current technology and science studies are thought to bring new inventions and new concepts to human history. For example, it will not be surprising to see that cloning and human cloning will come to the fore and take place in our lives in the future. It is also predicted that the concepts of human 1.0 and human X.0 will take place in our lives. As a matter of fact, it is thought that we will be considered as human 1.0 or will the generation that made the ancient knowledge or pyramids be considered as human 1.0. But it seems that it is thought that a new human module will take place in our lives through cloning.

Education 5.0

Education 1.0 appears as knowledge-based education. It is the education that is transferred from teacher to student and where memorisation is at the forefront. Education 2.0 is education in which students are considered as factory products while teaching technology is a goal. Education 3.0 is the education in which self-learning has become widespread with the widespread use of the internet and the use of Web 2.0 tools in education. When Education 4.0 is examined, the design and innovative use of technology in education is innovative-innovation processes. It is the individual's use of educational data, creation and support with technology (Er et al., 2021; Laura Icela et. al., 2023). In this education period where the teacher is a mentor, education is continued with integrations such as the Internet of Things, flipped classrooms, personalised data and cloud. Education 5.0 is seen as an educational approach that is estimated as 2030 and beyond and will settle in our lives. It is related to concepts such as digital literacy, digital fluency and the use of artificial intelligence. Here, digital fluency is expressed as the level of utilisation of constantly developing technologies beyond digital literacy. It appears as the ability to keep up with technological transformations with lifelong learning by combining technological developments and learning skills from 21st century skills (Kocaman-Karoğlu et al., 2020). Education 5.0 will be about guiding the individual with smart technologies and

machines and shaping his/her educational life (Eren, 2020; Kocaman-Karoğlu et al., 2020). With Industry 5.0, higher education should be integrated with higher education. It is aimed to train individuals who can carry out research and development activities, innovate in their work and focus on human values (Hashim et. al., 2024). With the development of industry, industrial changes and social transformations have taken place in parallel. Similarly, there have been and will be changes and transformations in education. In fact, considering the concrete examples of the changes that have occurred in education to date, it can be said that even if there have been permanent changes in the systems, there has not been an extreme change in student outcomes. Although some state policies or application examples create differences, it can also be said that when the same application is applied to different communities, the results are not at the desired level. Here, the importance of the individual's perspective on education and change in mentality rather than changes in education systems emerges. For example, when the 100-year histories of Japan, Germany and Turkey are analysed, it can be said that in similar years, the three states experienced terrible wars, suffered terrible losses, and suffered significant economic losses as well as territorial and human losses. When their past and present are compared, it is understood that there are differences between the development of the states. It is seen that Japan and Germany have exemplary activities for the world in areas such as economy, industry and technology. However, this is unfortunately not the case for Turkey and it is seen that it is only recently able to talk about itself in the world market. Are the differences between these states due to education? Or is it related to the awareness of their people? In the past, when technology or artificial intelligence was not so advanced, Germany and Japan have made significant progress in terms of economic, technological and welfare. Why has this not been the case for Turkey? Now, when Turkey is equipped with all advanced technologies and education and training is carried out, will there be a significant level of development in terms of economic, technological and welfare?

Gains of Society 5.0

It is estimated that there will be some changes in our lives with the concept of Society 5.0. Although there are concerns with the change, it is also thought that there will be gains.

Although ethics and morality differ according to time and period, today this concept shows that people do all kinds of business and transactions legally or illegally with concepts such as earning more profit, being profitable, guaranteeing their future or being strong. The basis of this is to earn more money and reserve it. With Society 5.0 in future generations, there will be no need for people to fall into this situation or make such plans. As a matter of fact, since equal service (including individual needs) and return according to need will be provided to every person regardless of their status and demographics, and for reasons such as guaranteeing or insuring their life in terms of health and life, it reveals the foresight that human fondness for money will decrease or even disappear. This situation will allow a more moral generation with ethical values to grow up.

- It is possible that there will be daily productions and scientific studies that create value and benefit humanity instead of individuals' worried daily lives such as earning, profit and yield.
- It is thought that there will be a consciousness in which every member of the society, regardless of their demographic characteristics, will focus on human talents and benefits to society with unconditional acceptance.
- Concepts such as developed, developing or poor-rich will disappear over time, and every person will benefit from the same services, and even their education, health and working conditions will be guaranteed by prioritising their individual characteristics.
- It is possible that terrorism or fear-based attacks will come to an end and social peace will be ensured as a result of emotional changes such as the fact that every individual and society is special and valuable with global acceptance.
- It is thought that communities will consist of conscious individuals who are at peace with nature, ready-planned for natural disasters and use sustainable resources and renewable energies as much as necessary.

In parallel with Society 5.0, of course, it is thought that there may be innovations in the field of agriculture. As a matter of fact, primitive agriculture 10,000 years ago (Agriculture 1.0), 18th century horse-ox supported agriculture using crude tools (Agriculture 2.0), 20th century water drainage and machine integrated agriculture (Agriculture 3.0), agriculture using digital machines from planting to medicine, also known as modern agriculture (Agriculture 4.0) and agriculture of the future Agriculture 5.0. 0; It is aimed to collect, process and market large volumes of agricultural data with high profits by taking into account climatic conditions, following weather data, processing soil and crop conditions, producing food with appropriate resource utilisation and preventing waste with technology integrated agricultural machines and internet integration of these machines in meeting the food needs of the increasing population (Parte et. al, 2024). In obtaining products in agriculture, it is thought that large gains will be achieved by using unmanned objects in the process of planting, fertilising, spraying, mowing, harvesting and processing of the products grown with objects that can recommend products to the farmer by providing soil analysis, meteorological data, moisture condition, market situation and supply and demand balance, and marketing it at the right place and time.

DATA AVAILABILITY

Conflict of Interest: There is no conflict of interest between editors.

REFERENCES

- Arı, E. S. (2021). Super smart society: Society 5.0. *Dokuz Eylul University the Journal of Graduate School of Social Sciences*, 23 (1), 455-479. <https://doi.org/10.16953/deusosbil.808359>
- Bilgi Teknolojileri ve İletişim Kurumu [BTK] (2021), Toplum 5.0 (Society 5.0). Sektörel Araştırma ve Strateji Geliştirme Dairesi. [Sectoral Research and Strategy Development Department] <https://www.btk.gov.tr/uploads/pages/arastirma-raporlari/toplum-5-0-arastirma-raporu.pdf>
- Büyükgöze, S., & Dereli, E. (2019). *Society 5.0 and digital health*. IV. International Scientific and Professional Studies Congress-Science and Health, Ankara
- Calis Duman, M. (2022). Society 5.0: Human-focused digital transformation. *Journal of Social Policy Conferences*, 82, 309-336. <https://doi.org/10.26650/jspc.2022.82.1008072>
- Çipi, A., Fernandes, A. C. R. D., Ferreira, F. A. F., Ferreira, N. C. M. Q. F., & Meidutė-Kavaliauskienė, I., (2023). Detecting and developing new business opportunities in society 5.0 contexts: A sociotechnical approach. *Technology in Society*, 73, 1-16. <https://doi.org/10.1016/j.techsoc.2023.102243>
- Coelho, P., Bessa, C., Landeck, J., & Silva, C., (2023). Industry 5.0: The Arising of a Concept. *Procedia Computer Science*, 217, 1137-1144. <https://doi.org/10.1016/j.procs.2022.12.312>
- El Khatib, M., Alzoubi, H. M., Hamidi, S., Alshurideh, M., Baydoun, A., & Al-Nakeeb, A. (2023). Impact of Using the Internet of Medical Things on e-Healthcare Performance: Blockchain Assist in Improving Smart Contract. *Clinico Economics and Outcomes Research*, 15, 397–411. <https://doi.org/10.2147/CEOR.S407778>
- Er, H., Turan, S., & Kaymakçı, S., (2021). Evaluation of the development of the society 5.0 process and its impact on education. *Adiyaman University Journal of Social Sciences*, 14(39), 27-66. <https://doi.org/10.14520/adyusbd.993699>
- Eren, Z. (2020). Toplum 5.0 ve dijital dünyada toplumsal dönüşüm ve eğitim 5.0. (Society 5.0 and social transformation and education in the digital world 5.0.). (Ed: Akçay, D., & Efe, E.,) Digital Transformation and Processes. Istanbul Gelişim University Press.
- Golovianko, M., Terziyan, V., Branytskyi, V., Malyk, D., (2023). Industry 4.0 vs. Industry 5.0: Co-existence, Transition, or a Hybrid. *Procedia Computer Science*, 217, 102-113. <https://doi.org/10.1016/j.procs.2022.12.206>
- Hashim, M. A. M., Tlemsani, I., Mason-Jones, R., Matthews, R., & Ndrecaj, V., (2024). Higher education via the lens of industry 5.0: Strategy and perspective. *Social Sciences & Humanities Open*, 9, 1-16. <https://doi.org/10.1016/j.ssaho.2024.100828>

- Holroyd, C. (2022). Technological innovation and building a ‘super smart’ society: Japan’s vision of society 5.0. *Journal of Asian Public Policy*, 15(1), 18–31. <https://doi.org/10.1080/17516234.2020.1749340>
- Huang, S., Wang, B., Li, X., Zheng, P., Mourtzis, D., & Wang, L., (2022). Industry 5.0 and Society 5.0—Comparison, complementation and co-evolution. *Journal of Manufacturing Systems*, 64, 424-428. <https://doi.org/10.1016/j.jmsy.2022.07.010>
- Jamil, M. A., Mustofa, R., Hossain, N. U. I., Rahman, S. M. A., & Chowdhury, S., (2024). A structural equation modeling framework for exploring the industry 5.0 and sustainable supply chain determinants. *Supply Chain Analytics*, 6. 1-13. <https://doi.org/10.1016/j.sca.2024.100060>
- Kipps, K. L., & Jones, A. K. (2020). Things are looking up: Using cloud-based technology tools in collection management workflows. *Serials Review*, 46(3), 215–223. <https://doi.org/10.1080/00987913.2020.1806646>
- Koçak, R. (2020). The fifth industrial revolution: Society 5.0 and the culture of artificial intelligence, *Journal of International Folklore Research*, 3, 1-17.
- Kocaman-Karoğlu, A. Bal-Çetinkaya, K., & Çimşir, E., (2020). Digital transformation of education in Turkey in society 5.0. *Journal of University Research*, 3(3), 147-158. <http://dx.doi.org/10.26701/uad.815428>
- Kumaş, E., & Erol, S. (2021). Digital twins as key technology in Industry 4.0. *Journal of Polytechnic*, 24(2), 691-701. <https://doi.org/10.2339/politeknik.778934>
- Laura Icela, G. P., María Soledad, R., Juan Antonio, E., (2023). Education 4.0 maturity models for society 5.0: Systematic literature review. *Cogent Business & Management*, 10(3), 1-17. <https://doi.org/10.1080/23311975.2023.2256095>
- Lechevalier, S. (2024). Society 5.0 and new capitalism: complementarities and contradictions. *Asia Pacific Business Review*, 30(3), 467–484. <https://doi.org/10.1080/13602381.2024.2320538>
- Mandal, D., Zou, L., Abedin, J., Zhou, B., Yang, M., Lin, B., & Cai, H. (2023). Algorithmic uncertainties in geolocating social media data for disaster management. *Cartography and Geographic Information Science*, 1–18. <https://doi.org/10.1080/15230406.2023.2286385>
- Martínez-Gutiérrez, A., Díez-González, J., Perez, H., & Araújo, M., (2024). Towards industry 5.0 through metaverse. *Robotics and Computer-Integrated Manufacturing*, 89, 1-13. <https://doi.org/10.1016/j.rcim.2024.102764>
- Moradi, S., Khan, M. M., Hossain, N. U. I., Shamsuddoha, M., & Gorod, A., (2023). Modeling and assessing seismic resilience leveraging systems dynamic approach: A case study of

- society 5.0. *International Journal of Critical Infrastructure Protection*, 43, 1-18.
<https://doi.org/10.1016/j.ijcip.2023.100639>
- Panter, L., Leder, R., Keiser, D., Freitag, M., (2024). Requirements for Human-Machine-Interaction Applications in Production and Logistics within Industry 5.0 – A Case Study Approach. *Procedia Computer Science*, 232, 1164-1171.
<https://doi.org/10.1016/j.procs.2024.01.114>
- Parte, M. S. E., Martínez-Ortega, J., Castillejo, P., & Néstor Lucas-Martínez, N., (2024). Spatio-temporal semantic data management systems for IoT in agriculture 5.0: Challenges and future directions. *Internet of Things*, 25, 1-22.
<https://doi.org/10.1016/j.iot.2023.101030>
- Piccarozzi, M., Silvestri, C., Fici, L., & Silvestri, L., (2024). Metaverse: A possible sustainability enabler in the transition from Industry 4.0 to 5.0. *Procedia Computer Science*, 232, 1839-1848. <https://doi.org/10.1016/j.procs.2024.02.006>
- Sharma, R., & Gupta, H., (2024). Harmonizing sustainability in industry 5.0 era: Transformative strategies for cleaner production and sustainable competitive advantage. *Journal of Cleaner Production*, 445, 1-23. <https://doi.org/10.1016/j.jclepro.2024.141118>
- Taniguchi, T., Murata, S., Suzuki, M., Ognibene, D., Lanillos, P., Ugur, E., ... Pezzulo, G. (2023). World models and predictive coding for cognitive and developmental robotics: frontiers and challenges. *Advanced Robotics*, 37(13), 780–806.
<https://doi.org/10.1080/01691864.2023.2225232>
- Tlili, A., Huang, R., & Kinshuk. (2023). Metaverse for climbing the ladder toward ‘Industry 5.0’ and ‘Society 5.0’? *The Service Industries Journal*, 43(3–4), 260–287.
<https://doi.org/10.1080/02642069.2023.2178644>
- van Deursen, A. J. A. M., van der Zeeuw, A., de Boer, P., Jansen, G., & van Rompay, T. (2021). Digital inequalities in the internet of things: Differences in attitudes, material access, skills, and usage. *Information, Communication & Society*, 24(2), 258–276.
<https://doi.org/10.1080/1369118X.2019.1646777>
- United Nations (2024). Department of economic and social affairs sustainable development. The 17 goals. <https://sdgs.un.org/goals>
- Wang, B., Zhou, H., Li, X., Yang, G., Zheng, P., Song, C., Yuan, Y., Wuest, T., Yang, H., & Wang, L., (2024). Human Digital Twin in the context of Industry 5.0. *Robotics and Computer-Integrated Manufacturing*, 85, 1-25.
<https://doi.org/10.1016/j.rcim.2023.102626>
- Whittaker, D. H., & Nakata, Y. (2024). Reforming Japanese capitalism: Introduction. *Asia Pacific Business Review*, 30(3), 421–432.
<https://doi.org/10.1080/13602381.2024.2320533>

- Xu, Z., & Zou, C. (2021). What can block chain do and cannot do? *China Economic Journal*, 14(1), 4–25. <https://doi.org/10.1080/17538963.2020.1748968>
- Yamasaki, Y., (2024). The Japanese government’s promotion of automated driving driven by shared positive expectations. *Futures*, 155, 1-16. <https://doi.org/10.1016/j.futures.2023.103282>
- Yetkin, E. G. & Coşkun, K. (2021). Industry 5.0 (Society 5.0) and architecture. *European Journal of Science and Technology*, (27), 347-353. <http://dx.doi.org/10.31590/ejosat.969631>