Section 3.2. Society 5.0: the New Reality of Digital Civilisation

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Abstract. *This section conceptualizes Society 5.0 as an emergent reality of digital civilisation in which technologies move from external instruments to constitutive elements of consciousness, identity, and everyday social practice. It argues that metaverse environments, mixed reality, artificial intelligence, and NBIC convergence reconfigure communication, labour, education, and the very experience of "reality," while simultaneously intensifying ethical risks related to privacy, autonomy, security, and inequality. The objective is to provide a comprehensive interdisciplinary analysis of Society 5.0 as a qualitatively new phase of human–technology interaction, to clarify its sociocultural, philosophical, educational, and ethical dimensions, and to outline strategies for harmonising technological innovation with humanistic values. The study applies an interdisciplinary design combining sociological, philosophical, technological, and ethical analysis. It uses systems analysis to trace structural changes in social relations, comparative analysis to differentiate Society 5.0 from earlier stages of development, content analysis of academic and strategic documents to map key trends, expert evaluation to synthesise positions of contemporary thinkers and futurists, case study analysis of corporate platform implementation, and prognostic reasoning to assess future scenarios and risks. The section demonstrates that physical and virtual realities increasingly merge into a single sociotechnical space, producing new forms of interaction, labour organisation, and learning. It identifies digital skills as a prerequisite for participation in the labour market and civic life, while virtual education expands access and personalisation through immersive and AI-driven environments. At the same time, it records key challenges: digital inequality, algorithmic bias, job displacement, deepfakes, surveillance pressures, and the need for enforceable digital ethics. Society 5.0 is framed as a human-centred civilisational paradigm whose sustainability depends on coupling NBIC and AI capabilities with rights-based governance, inclusivity, and value-oriented education. Further research should develop measurable models of digital ethics and inclusivity, evaluate the long-term effects of immersive learning on cognition and socialisation, investigate governance mechanisms for trustworthy AI and metaverse ecosystems, and compare policy approaches that reduce digital skill gaps across regions and generations.*

Keywords: *society 5.0; digital civilization; metaverse; mixed reality; NBIC convergence; digital skills; virtual education; digital ethics; artificial intelligence.*

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1. From “digital tools” to “digital civilisation”. We are living in a time of tremendous change, when digital technologies are fundamentally transforming not only certain areas of our lives, but also the very foundations of social interaction. The terms "cybersociety", "society 5.0" and "digital civilisation" emphasise that technology is no longer an external tool, but is becoming an integral part of our consciousness, identity and life. They are changing the way we think about work, education, communication, reality and even humanity. In this new digital era, we are faced with a key question: how do we remain human in a world where the boundaries between the real and the virtual are becoming increasingly blurred?

The question is extremely relevant in a context where technology is rapidly changing not only our everyday life, but also the very essence of social, cultural and economic relations. We live in a time when technological innovations, including virtual reality, artificial intelligence, digital skills, and the latest scientific advances such as NBIC convergence, are transforming the way we see the world and our own identity. These processes are changing the way humans and machines interact, as well as shaping new social structures and ethical challenges.

Humanity is on the verge of an era where the concept of reality is becoming increasingly blurred. Mixed reality, which combines the physical and virtual worlds, places new demands on how we build our relationships, how we learn, and how we organise our lives in the face of constant technological transformation. NBIC technologies (nanotechnology, biotechnology, information technology and cognitive sciences) offer new opportunities, but they also require responsibility, as they affect the very essence of human existence.

This study covers a number of important issues that cannot be ignored. The metaverse, as a new virtual reality, not only allows us to change the way we communicate, but also radically affects cultural and social processes. Technology is becoming not just a tool, but also an active participant in shaping new realities. Mixed reality, which integrates simulations, virtual worlds and material existence, blurs the line between the real and the virtual, forcing us to rethink the basis of our interaction with the world around us.

But with these opportunities come challenges. Technology raises ethical questions that have never existed before, including privacy, autonomy, equal access and the impact of technology on human consciousness. In addition, there is a growing need for digital skills, which are becoming not just an advantage but a necessity in today's world, where everything is rapidly becoming digital.

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Education is also undergoing dramatic changes. Virtual education opens up new horizons for learning, allowing us to cross borders between countries and cultures. At the same time, this process places new demands on how we learn, how we organise learning processes, and what are the core competencies for future generations.

Equally important is the role of artificial intelligence, which is changing the very nature of work and the way people interact with technology. The philosophy of intelligent machines requires a new understanding, where the boundaries between human and machine intelligence are becoming less and less obvious.

Therefore, covering issues ranging from the Metaverse to digital skills, from ethical challenges to virtual education helps us to better understand how technology affects us and what exactly makes this society a "society 5.0". These are not only technical changes, but also profound socio-cultural, moral and ethical transformations that determine our place in the new reality of digital civilisation.

The scientific novelty of the research lies in defining Society 5.0 as a qualitatively new stage of human–technology interaction, within which physical and virtual realities are integrated into a unified sociocultural space. The study reveals the philosophical and ethical foundations of the digital age through the ideas of N. Bostrom, F. Fukuyama, A. Toffler, and Y. Harari, and introduces the concept of digital ethics as a prerequisite for harmonizing technological progress with humanistic values. It also outlines key trends in virtual education and the development of digital skills as fundamental factors of human adaptability and resilience in the digital environment. The findings emphasize that only the integration of technological innovation with the preservation of core humanistic principles can ensure sustainable and human-centered development within digital civilization.

The study uses an interdisciplinary approach that combines sociological, philosophical, technological and ethical analysis of digital transformations in Society 5.0. Several key methods were used to understand the large-scale changes taking place in the social, economic, cultural and educational spheres under the influence of the latest technologies.

Systems analysis helps to trace how technological innovations change the structure of society, its interconnections and forms of interaction. The comparative method helps to identify the differences between traditional and digital models of social relations, as well as to understand what makes Society 5.0 unique compared to previous stages of development. Content analysis of scientific publications, reports, analytical studies and digital

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development strategies makes it possible to assess general trends and directions of change.

A special role is played by the expert evaluation method based on the analysis of opinions of researchers, digital specialists, philosophers, sociologists and futurists. Their findings help to better understand not only the technical aspects of digital transformation, but also its impact on social consciousness, values and the way people interact. Case study analysis allows us to explore specific examples of the introduction of digital technologies in various spheres of life, including education, the economy, the labour market and social communications.

The prognostic method is used to assess future scenarios for the development of digital civilisation: what opportunities new technologies offer, what challenges we may face, and how we can minimise the risks associated with digitalisation. The study is based on empirical data obtained from open sources, materials from scientific conferences, government and international digital development strategies, as well as real-life examples of technology implementation in everyday life.

2. Metaverse 5.0 as a sociocultural phenomenon. The metaverse opens the gateway to the era of Digital Civilization 5.0, transforming not only communication but also the spheres of work, education, and culture. The NBIC convergence technologies (nanotechnology, biotechnology, information and cognitive sciences) are helping to create innovations that can improve our lives. At the same time, we are facing important questions: how to ensure the security of personal data, how to avoid digital isolation and preserve ethical principles in the new world?

Mixed reality, which blurs the boundaries between the physical and digital worlds, opens up many new opportunities for learning, creativity and interaction. It allows us to look at the educational process in a new way, providing the opportunity to learn and work in interactive, immersive environments where the physical and virtual worlds are intertwined. This technology allows everyone to access new knowledge and experience without even leaving home. Online courses, virtual lectures, interactive platforms - all of this is giving us a new era of education where everyone can gain knowledge regardless of geographic location or social status. But with these enormous opportunities, the question arises: will we be able to preserve real live communication and the warmth of human relationships in a world where digital technologies are increasingly taking over?

Digital skills are now a necessity to stay competitive in today's labour market. They open doors to new opportunities in our professional lives, help us interact effectively with technology and adapt to a rapidly changing world.

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However, at the same time, we have to ask ourselves the question: will we lose some important human qualities with the development of technology? Will the modern world become so automated that people will cease to be the main value? Will the ability to think critically, to show empathy and to be creative disappear from our lives if we rely more and more on digital tools? And how can we find a balance between the need to implement new technologies and preserve our humanity?

Artificial intelligence is changing our world and posing serious challenges. These technologies are capable of performing tasks that were previously only available to humans and can even help us solve complex problems. However, can a machine really understand us as well as another human being? Is artificial intelligence capable of truly understanding human emotions, feelings and needs, or does it only mimic these processes? How can we find the right balance between automation and preserving human values? This question does not have a clear answer, but it requires serious reflection on how we, as a society, want to interact with technology.

Technology and humans are interacting on a new level - this is not only a technological leap, but also a serious challenge for all of us. It depends on us whether we can preserve our humanity in this digital world, whether we will not lose our ability to be real people if we only blindly follow technological progress. In this world, it is important to ensure comfort, safety and accessibility for everyone, while preserving the core values that make us human. While remaining open to new opportunities, we must remember the importance of maintaining real connections between people, not just through screens. Yes, technology can be incredibly useful, but it should not replace interactions that preserve our dignity, emotional depth and capacity for genuine compassion. All these aspects must be interconnected and complementary so that we can build a world where humanity and technology coexist in harmony.

A world where physical and digital realities are intertwined, where our avatars interact in virtual spaces as easily as we do in our everyday lives, is not a distant future - it is the era of Metaverse 5.0, which is already on the horizon and opens up new opportunities for humanity.

What is Metaverse 5.0? Metaverse is a virtual world created using augmented reality (AR) and virtual reality (VR) technologies where users can communicate, work, learn and have fun. The 5.0 revolution means a new level of integration and interaction between the real and virtual worlds, thanks to technological advances in artificial intelligence, blockchain, and the Internet of Things (IoT) [1, 2].

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Electronic personalities and avatars rarely reproduce the actual appearance or behaviour of people. Even more rarely do they look like their owners or users. Usually, an electronic avatar is an imaginary, generalised or idealised image of a person or a fictional character with fantastic powers or superfunctions that are possible only in the metaverse. The definitions of terms such as metaverse, e- human, e-person, and e-avatar are still not clearly defined. This leads to numerous variations in their use in popular literature and in everyday life to describe events taking place in virtual realities [3].

Today, companies are actively investing in the development of virtual reality and metaverse technologies, opening up new horizons for users around the world. Recent acquisitions and investments by major market players demonstrate the growing importance of these areas. ByteDance, known as the developer of the popular social platform TikTok, has made a significant step towards the development of virtual solutions by acquiring Pico, a company specialising in the development of high-quality virtual reality products, and this deal opens up new opportunities for ByteDance. The main goal of is to develop the areas of electronic twins and 3D reconstructions of objects. By using Pico's technology, ByteDance plans to enhance its platforms, allowing users to create detailed digital copies of themselves and those around them, as well as recreate real objects in a virtual space. This could dramatically change the way people interact in virtual worlds, taking the user experience to a new level.

Another significant event in the world of virtual reality is NetEase's investment in IMVU (Instant Messaging Virtual Universe). IMVU is the world's largest social network built around avatars, virtual goods, and 3D worlds. With over 50 million registered users, IMVU offers a unique platform for social interaction in a virtual environment. NetEase's investment in IMVU is a testament to the growing importance of social media in 3D worlds. NetEase plans to leverage IMVU's expertise to enhance its own projects and create new experiences for users. This may include developing new ways to communicate, exchange virtual goods and participate in shared virtual events.

The creation of electronic twins and 3D reconstructions of objects will allow users to interact more realistically in virtual worlds. Social networks in 3D worlds, such as IMVU, will provide new ways for social interaction and self-expression: unique avatars, buying and exchanging virtual goods, participating in virtual events and creating your own virtual space. Unlimited possibilities for creativity and communication will make virtual realities an integral part of our daily lives. This means that in the coming years, we can

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expect significant changes in the way we interact in virtual space, offering users new and exciting opportunities for development and self-expression.

Epic Games, a well-known developer of interactive games, has announced the creation of its own metaverse called Epic Games. This platform will be designed for interactive fantasy games, allowing players to immerse themselves in fascinating virtual worlds with rich graphics and complex plots. Epic Games' goal is to create a space where players can interact with each other while engaging in exciting adventures and quests. Using advanced technologies such as the Unreal Engine, the company plans to ensure high quality visuals and realistic gameplay. This metaverse promises to be a unique place for gamers to not only play but also create their own stories and worlds [4].

Recently, the Chinese search giant Baidu announced an ambitious project to colonise the first planet of the metaverse, known as Xirang, or the Land of Hope. At the same time, other major Chinese companies are uniting to create the Metaverse Industry Committee, which aims to attract Chinese citizens to the metaverse on a massive scale. The project provides for the simultaneous operation of up to 100,000 avatars, making it one of the largest virtual spaces created to date. The first major test of this space will take place during the Baidu AI Developer Conference, where participants' avatars will be able to interact in real time, discussing new technologies and innovations. The wonderland-like immersive virtual planet will give conference participants an unforgettable experience. Here, the avatars of all participants will watch panel presentations and participate in discussions, party at discos, visit exhibition stands, enjoy concerts with cartoon characters (Optimus Prime from Transformers, etc.), travel to ancient monasteries where monks will teach them Shaolin Kung Fu, and do many other things: shop, meet new people [5].

Metaverse 5.0 promises to fundamentally change the way we approach education, opening new horizons for students and teachers around the world. Using virtual classrooms, laboratories, and simulations, learning becomes not only more interactive, but also more accessible to a wider range of people. This is especially important for disciplines where practice is an integral part of the learning process, such as medicine and engineering. Instead of traditional lectures and textbooks, students will be able to interact with the material in a virtual environment, making learning more effective and interesting. Reproduction of real scenarios and situations in a virtual environment will allow gaining practical experience and skills that can be applied in real life [6].

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The virtual world, Metaverse 5.0, is a new stage in the development of the future of humanity, which combines the physical and digital worlds through augmented reality and virtual reality technologies. This opens up new opportunities for humanity in communication, work, education and entertainment.

The main characteristics of Metaverse 5.0 include the creation of electronic personalities and avatars that allow users to interact more realistically in virtual worlds, as well as social networks in 3D worlds that provide new opportunities for social interaction and self-expression. Companies are investing heavily in the development of these technologies, which demonstrates their significance and importance.

Projects such as Epic Games and Xirang reflect the diversity of uses for metaverse 5.0, from gaming to social platforms and virtual planet colonisation. These initiatives have the potential to fundamentally change the way we interact in virtual space and in education, making virtual realities an integral part of everyday life. The era of virtual reality promises to be a key tool in improving the quality of education and training of future generations of leaders and innovators.

3. NBIC Convergence: Technological Synergy and Humanitarian Challenges. The concept of NBIC convergence is becoming increasingly relevant, opening endless opportunities and challenges for society. NBIC convergence brings together nanotechnology (N), biotechnology (B), information technology (IT) and cognitive sciences (C), interacting with each other and referring to each other. This synergistic approach has the potential to change all aspects of life in society, including medicine, industry, education, economics and ethics.

Philosophers and ethicists are actively engaged in studying and discussing the impact of NBIC convergence on society and put forward different points of view on this topic. Some emphasise the limitless opportunities it provides and see it as having the potential to improve the quality of life. They emphasise the importance of scientific research and technology development for gaining new knowledge and implementing innovative solutions in various fields. Others question the unlimited optimism and are concerned about the consequences that may arise [7, 8, 9, 10].

One of the most obvious impacts of NBIC convergence on society is the revolution in medicine. Thanks to the combination of nanotechnology, biotechnology and information technology, doctors are gaining new opportunities for diagnosing, treating and preventing diseases. Nanorobots implanted in the body can detect and treat diseases at early stages, providing

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more efficient and accurate medical care. In addition, the development of implants and prostheses using nanomaterials and biocompatible materials opens up new prospects for reconstruction and improvement of people's physical capabilities [7].

NBIC convergence is an incredibly powerful process that combines nanotechnology, biotechnology, information technology, and cognitive science. These technologies are not only changing the face of industry and the economy but are also capable of rewriting the rules of the game in education, creating new opportunities for development and innovation.

In the industrial sector, NBIC technologies offer huge potential for improving production processes. For example, nanotechnology makes it possible to create materials with completely new properties: lighter, stronger, and more environmentally friendly. This is important for industries such as electronics, aviation, automotive and energy, as it helps to create products that last longer, require fewer resources and are less harmful to the environment. Biotechnology adds another important aspect: it enables the development of biologically sustainable materials, the production of clean fuels and the creation of environmental clean-up methods that do little to harm natural systems. It's not just innovation - it's the path to a cleaner and healthier future.

But NBIC convergence is not limited to industry. It is also having a major impact on education. Thanks to information technology and cognitive science, learning is becoming more personalised and accessible. It is now possible to create individualised curricula that are tailored to the needs of each student, helping them to learn at their own pace and in their own way. Thanks to the use of artificial intelligence, learning platforms can analyse a student's progress and provide them with tasks that best suit their level. Virtual and augmented reality allows for the creation of learning environments where students can interact with objects and processes as if they were already working in the real world. Doctors can train their skills in operating theatres, engineers can test new designs, and sociologists can analyse various social situations in real time.

An equally important advantage of these technologies is that they make education more accessible to people with special needs. Thanks to voice assistants, special touchscreen devices and AI-powered software, students can receive individualised support to help them overcome barriers to learning. For example, students with visual impairments can listen to texts, and AI-powered technologies adapt learning content to their needs to ensure that it is easy and effective to understand. For those with hearing impairments, there are technologies that automatically translate speech into

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text or even synthesise sign language, allowing them to receive information in the most convenient format. All these innovations give students the opportunity to feel like equal participants in the learning process and support their development in the aspects they need most. This not only removes physical barriers, but also opens up opportunities for inclusive, individualised learning, where everyone can move at their own pace and achieve their goals without feeling restricted.

However, along with the many opportunities, NBIC convergence also poses challenges and ethical issues for society. For example, the use of nanotechnology and biotechnology raises questions about the safety and control of these technologies. It is important to develop ethical norms and legal frameworks to prevent possible misuse and abuse of NBIC technologies [9].

For example, it is important to consider the ethical aspects of using nanorobots in medicine, to ensure the confidentiality and protection of personal data in the field of biotechnology, and to balance the use of information technology and cognitive sciences with the issues of privacy and ethical use of the data obtained.

In addition, NBIC convergence may lead to social inequalities and a gap between those who have access to these technologies and those who do not. The high costs of research and development of new technologies can limit the accessibility of innovations to the general population. Therefore, it is important to ensure that the benefits of NBIC convergence are accessible and equitably distributed, in particular by developing policies to bring the technologies to regions with less developed infrastructure and to provide access to education and training on these issues.

Overall, the NBIC convergence opens up many opportunities for society in various fields, including medicine, industry and education. However, the successful integration of these technologies requires not only scientific advances, but also ethical consideration, management and resolution of the social and economic challenges that accompany this process. The following steps will be critical to determine the path of NBIC convergence, ensure sustainable growth and maximise its positive impact on society [9].

NBIC convergence has the potential to change the way we perceive ourselves and the world around us. The integration of cognitive sciences into this concept makes it possible to explore and understand the principles of human brain and consciousness functioning. This opens the door to understanding the processes of thinking, memory, learning and creativity. In

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the future, this can lead to the development of technologies that change the way we perceive, see ourselves and interact with the world around us.

However, along with its many benefits, NBIC convergence also raises questions about security and privacy. As the ability to collect, process and analyse large amounts of data grows, questions arise about maintaining confidentiality and protecting personal information. For example, the use of biometric data for identification and authentication can pose potential risks of misuse and privacy violations.

In addition, NBIC convergence has the potential to create new forms of inequality and exclusion. If these technologies become available only to a limited number of people or countries, a new kind of inequality may emerge that could deepen social divisions. It is therefore important to ensure broad access to these technologies and to develop inclusive development strategies.

Finally, the NBIC convergence opens the door to incredible opportunities for the development of society: industry, education, medicine, research and many

other areas. Through the combination of nanotechnology, biotechnology, information technology and cognitive science, we can develop new materials, devices, methods and generate knowledge that have the potential to benefit society.

One of the most important impacts of NBIC convergence is to improve the quality of life. In medicine, these technologies can help detect and treat diseases at early stages, providing more effective and individualised treatment. The use of nanotechnology in the development of implants and prosthetic devices allows people with disabilities to regain their physical independence. Biotechnology can help develop new medicines and vaccines, as well as improve agriculture and food security. Information technology and cognitive sciences are developing new teaching methods that contribute to the development of society's intellectual potential.

NBIC convergence also affects the economy, creating new opportunities for innovation, entrepreneurship and the development of new industries. It promotes the emergence of new markets and accelerates technological progress. For example, the development of new materials and devices opens the way to new products and services, which leads to increased production and employment.

In addition, NBIC convergence can have a significant socio-cultural impact on society. It helps to change our understanding of humans, their capabilities and interaction with technology. New ethical dilemmas and moral issues are emerging that require in-depth discussion and definition. For example, the use of smart devices and artificial intelligence can raise

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questions about data privacy and security and affect our relationships and social connections.

The cultural impact of the NBIC convergence is also evident in the arts and entertainment sector. Interactivity, virtual reality, and augmented reality open up new possibilities for creativity and self-expression. Art can be enriched by new forms of interaction, interactive immersive installations, and art generation using artificial intelligence. The entertainment industry can also take advantage of NBIC technologies to create more realistic and immersive experiences in films, video games, and content production [10].

An important aspect of successful integration of NBIC convergence is education and training. Programmes and courses need to be created that develop the skills and knowledge necessary to understand and use these new technologies. Educational institutions should actively introduce disciplines covering NBIC convergence and support research in this area. It is also important to develop educational programmes for the general public to raise awareness and understanding of the impact of NBIC technologies on society [10].

The NBIC convergence opens up unprecedented opportunities for humanity, changing not only the economy, science and society, but also our everyday experience. These technologies can improve the quality of life, help solve global problems and expand the boundaries of human capabilities. However, it is important to keep in mind the ethical and social challenges associated with their implementation: how to ensure safety, equal access and preservation of humanity in a rapidly changing world?

4. Mixed Reality and the Phenomenology of Perception. One of the most striking examples of this technological breakthrough is mixed reality (MR). It is no longer just an idea from the pages of science fiction, but a real tool that combines the physical and digital worlds, changing our perception of reality. MR opens up new opportunities for learning, creativity, communication and even self-discovery. But at the same time, it raises important philosophical questions: what is reality in a world where the boundaries between the material and the virtual are becoming increasingly blurred? Can be considered a new level of existence? And how can we avoid losing what makes us human in this process?

In 1994, Milgram and Kishino (1994) defined Mixed Reality (MR) as "a combination of real and virtual environments in which objects from the real world interact with virtual objects in real time" [11].

Researchers describe mixed reality as an environment where users can interact with real and virtual elements simultaneously, and both worlds have a certain degree of presence.

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Once upon a time, reality was clearly divided into material and imaginary. Today, this division is blurring. We live in a world where digital objects can interact with physical objects, and physical objects can acquire digital properties. Imagine a city where traffic is regulated by artificial intelligence systems that analyse the situation in real time, or classrooms where students can experiment with physical laws in an MR environment. This is not just a technological advancement - it is a new way of being.

Plato (2000), through the myth of the cave, depicts the idea that the visible is not the true being, but only its shadow [12, p. 209 - 239]. Similarly, in mixed reality, we observe the superimposition of digital objects on the physical world, which raises the question of their ontological status. Are they just shadows, or do they have their own level of being?

In his phenomenology, Edmund Husserl emphasised that our consciousness is always directed towards something, and this is what determines the way we perceive reality [13, p. 83 - 96]. In other words, we do not just passively observe the world - we actively attach meaning to everything around us. This applies not only to material things but also to virtual objects. Even if they do not have a physical form, they can become real to us through interaction with them, becoming part of our experience.

Mixed reality, which combines the digital and physical worlds, further expands the possibilities of our consciousness. It creates a single cognitive space in which virtual phenomena can be as meaningful as real ones. For example, digital avatars, holograms, or even artificial intelligence are no longer just images on a screen – they become part of our interaction, evoke emotions, and shape our thinking.

That is why Husserl's phenomenology helps us understand how mixed reality changes our perception. Imagine working with a virtual assistant or participating in a virtual event – at this point, the digital world becomes almost as real to you as the physical world. Consciousness seems to "switch" between these levels, adapting to new conditions. This phenomenon can be called the "lift of intentionality" – the ability of our minds to move between different realities without losing the sense of presence.

Husserl also emphasised the importance of subjective experience. Through phenomenological analysis, we can understand how mixed reality affects our attention, memory, and even identity. After all, today digital technologies not only complement our world, but also re-shape it, creating new opportunities for learning, communication, and creativity [13].

Thus, phenomenology helps us to look at mixed reality not only from a technical but also from a human point of view. It is not just a new technology,

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it is a way of interacting with the world in which our consciousness plays a key role in shaping our experience.

When we talk about mixed reality, we inevitably touch upon the issue of simulation. The French philosopher Jean Baudrillard considered the simulacrum as a sign that has no real referent, but in mixed reality, simulation does not just imitate reality - it constructs it. In the digital world, virtual objects can interact with physical ones, creating situations that become ontologically significant [14, p. 175].

That is, if simulation begins to influence our perception and behaviour, doesn't it become a part of being? Today we see how digital objects do not just copy the real but create a new dimension of our existence. We are no longer just observers, but participants in the world that is being formed before our eyes.

Twentieth-century philosophers, such as Gilles Deleuze, interpreted the virtual as something potential that can become actual. In the context of mixed reality, virtuality is no longer something purely imaginary – it materialises in the form of digital objects that interact with humans and the physical world. For example, in medicine, MR is used to create surgical models that, although not "material" in the traditional sense, influence the physical actions of doctors. This shows that the boundary between the virtual and the real is not just blurred but transformed [15].

In classical philosophy, existence was defined through materiality. However, in mixed reality, new forms of existence are emerging digital objects that can have a physical impact, and physical objects that are extended by digital properties. For example, smart environments, where digital algorithms control physical processes, create situations in which existence becomes hybrid. Here, we can draw a parallel with Bruno Latour's concept of actor-network theory: digital entities in MR become agents that influence the material world [16].

The digital world brings with it not only opportunities but also new questions. How does mixed reality affect our identity? Can we talk about the existence of a personality in virtual space in the same way as in physical space? People are already creating digital avatars, holding meetings in VR, and forming relationships in a world where physical contact is not mandatory. Does this mean that we are gradually moving to a new form of social interaction?

Mixed reality doesn't just expand the boundaries of our world – it changes the very way we perceive and interact with it. But with new opportunities come new challenges. As digital technologies become part of

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our everyday lives, how do we find a balance between reality and virtuality, between freedom and responsibility?

However, technological progress brings not only convenience and new opportunities, but also important ethical issues. How do we maintain privacy in a world where information has become a currency? How do we make sure that technology works for the benefit of people rather than restricting their freedom? All this requires not only technical knowledge but also a deep understanding of what values we want to preserve in the digital age.

The Internet, as a global computer network, provides users with vast amounts of information, which can be used to develop the ability to search for, process, store and transmit information using modern communication technologies. The use of Internet technologies has become essential for many aspects of our lives, including work, study, communication and entertainment. However, the growing use of these technologies can also have negative consequences for society, which requires attention to ethical aspects.

Social networks and social media have created a new world where people have become particularly vulnerable, as further developments in science and technology create new ethical challenges. In today's world, there is an acute problem of personal data, which has become especially relevant with the growth of personal information collected and processed on the Internet, as well as the problem of cyberbullying, which has become widespread among young people and has a significant impact on the psychological well-being of young people.

5. The Philosophical and Ethical Dimension of the Digital Age. At the same time, the development of artificial intelligence raises new ethical challenges related to its use. One of the main issues is that artificial intelligence can replace human labour and affect employment. This could have serious economic and social impacts on society. In addition, artificial intelligence can create inequality in access to the latest technologies and skills, which adversely affects people who do not have access to them [17, p. 40].

Ethical issues in the digital environment are of relevance, as technology is developing rapidly, and new ethical challenges are emerging along with it. It is becoming an important task for society and scholars to understand how these changes affect our lives, interactions, and social norms. Digital ethics, which explores these issues, has become one of the key topics in the works of philosophers and futurists who seek to understand how technology is transforming our understanding of ourselves and the world around us.

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Francis Fukuyama, a renowned futurist, examines trends in society and analyses in depth the role of technology in shaping our identity and the interaction between people and institutions. For him, the issue of digital ethics is one aspect of the overall process when technological progress affects our perceptions of ourselves, our dignity and place in society.

Fukuyama draws attention to the need for ethical use of artificial intelligence and automated systems. He emphasises that technology should serve the benefit of people, not become tools of manipulation or injustice. However, in his opinion, there is a risk that without proper ethical attention to this issue, we can get not only effective but also dangerous tools for society. The researcher calls on developers and technology companies to be aware of these risks and strive to ensure that artificial intelligence and machine learning are used responsibly, with respect for human rights and dignity [18, p. 37].

These problems are no longer just theoretical; they actively affect our real-life processes. Therefore, digital ethics is not only a subject of research, but also a vital component of our daily lives that we must take into account in order to ensure justice, equality and humanity in a world that is changing at a rapid pace.

One of the leading futurist philosophers who has devoted much attention to digital ethics is Nick Bostrom. In his writings, he explores the ethical issues associated with the development of artificial intelligence, robotics and other technologies. Bostrom argues that the growing power of technology can lead to significant ethical problems, such as threats to personal data and security, inequality and discrimination, and threats to human life and health [7, p. 201].

Alvin Toffler, an American sociologist and futurologist, known for his theories on the information society and technological changes on a global scale, in his book "A Future Shock" considers the ethical challenges arising from the development of digital technologies and the information society.

One of these challenges is the issue of personal data and security on the Internet. According to Toffler, the increase in the amount of personal information stored on the Internet can lead to ethical violations and unsafe use of this data. This can stand in the way of the development of the Internet economy and research that requires a large amount of personal data.

Another challenge is the issue of digital inequality and access to information. Digital inequality arises from unequal access to technology and the Internet, which can lead to a lag in the development and economy of countries and certain groups of people. It can also pose challenges to human rights to information and freedom of expression.

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In addition, Toffler draws attention to the challenges associated with intellectual property and cultural heritage in the digital world. In particular, the growing possibility of copying and disseminating information on the Internet may pose a threat to copyright and intellectual property. Also, the possibility of rapid dissemination of materials may lead to the loss of cultural heritage and historical monuments, as some materials may be lost or altered on the Internet.

Toffler notes the importance of developing ethics in the digital environment. According to him, the growth of information and technology requires an increase in ethical awareness in the use of these tools. For example, this may relate to data security, rules of interaction in social networks, and ethical responsibility in working with artificial intelligence [19, p. 90].

The ethical challenges of the digital age concern each of us. They determine what our future will look like in a world where technology is increasingly penetrating everyday life. To ensure that the digital space remains safe, fair and comfortable for everyone, an ongoing dialogue between scientists, educators, the public and technology companies is needed. Only by working together can we create an environment where technology helps people rather than threatens their privacy, security or moral values.

6. Virtual Education and Digital Skills. One of the most significant areas where digital technologies are changing our perceptions of what is possible is education. Virtual learning used to be just an interesting experiment, but now it has become an integral part of the educational process. This opens up new horizons: access to knowledge is no longer limited to the place of residence or the ability to attend lectures offline. But at the same time, questions arise: how to maintain the quality of education in the digital environment? How to avoid losing the live dialogue between students and teachers? How to teach not only facts, but also critical thinking, cooperation and empathy?

The education of the future is not just a set of digital tools, but a way to build a society where technology works for the benefit of people. And our task today is to make this world as human as possible.

Distance learning is becoming a real revolution in pedagogy. The use of virtual reality (VR) and augmented reality (AR) opens up new horizons for students. These technologies allow students to immerse themselves in a virtual environment and interact with it, even if they are physically in another place [20].

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Virtual reality (VR) creates virtual environments that can be used to simulate real-life situations. It is especially effective for training in medical, engineering, and other sciences. Augmented Reality (AR) allows virtual objects and information to be added to the real world, which can improve understanding of concepts and provide new learning opportunities. AR can be used to create interactive textbooks that interact with real objects and environments [21, p. 46-62].

Interactive video and gaming technologies simulate learning scenarios in which students can interact with the content, giving them the opportunity to solve problems and receive instant feedback. The creation of virtual scenarios and tasks where higher education students can apply knowledge in real-life situations contributes to the development of critical thinking and practical skills.

Virtual communities formed on the basis of virtual classrooms are a key element of global learning. They can bring together students, teachers, and experts from different parts of the world, providing an opportunity to network, share ideas, and collaborate on projects. Virtual forums, chats and shared resources create open spaces for discussion and interaction.

The use of artificial intelligence in virtual education creates a platform for an adaptive learning system. Algorithms can analyse students' progress and individual needs, providing personalised tasks and materials for optimal learning. Immersive technologies can collect data on student activity, allowing teachers and assessment systems to analyse progress and improve teaching methods.

Massive Open Online Courses (MOOCs) allow thousands of students to receive education simultaneously from renowned teachers and leading universities in different parts of the world, such as Prometheus, Coursera or Future Learn. This provides global access to high-quality education and opens up new opportunities for self-education.

Michio Kaiku is confident that the education of the future will no longer be based on memorisation. The necessary information will be easy to find instantly online, and people will have more time to analyse the facts. Online learning will be a common form of education. The education of the next 50 years will be mainly virtual universities, where learning will be based on a cloud-based system. Online universities are already becoming very popular, offering many interesting free courses. Soon, computers and Google Glass will be transformed into tiny lenses that allow you to download all the information you need. There are already augmented reality glasses that have this feature. Therefore, in a year or two, schoolchildren and students during

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exams will be able to easily search for answers to questions on the Internet: just blink and the necessary information will appear [22, p. 42].

The modern generation is facing new realities that force it to consider problems that have not yet been relevant. Society must prepare for life in a world that is constantly changing and can be seen as a "project". Education affects not only the current situation but also shapes the future, so the philosophy of education is constantly influenced by situational trends in educational policy. The vicissitudes of the modern educational process often lead to situations where it is difficult to predict the prospects of the desired future.

If the future of humanity is linked to the optimistic predictions of transhumanism, and science is used as an ally, then, as Michio Kaiku writes in his bestselling book The Physics of the Future, the future is in our hands: "The future is like a huge freight train rushing along the railway tracks in our direction. Behind this train - is the hard work of thousands of scientists who are inventing the future in their laboratories. You can hear the horn of this train. It proclaims: biotechnology, artificial intelligence, nanotechnology, telecommunications. However, some people resist: "I'm too old. I will not comprehend this anymore. I'll just lie down on the tracks and let the train run me over." Meanwhile, young, energetic, ambitious people react differently: "Take me on this train! This is my future. This is my destiny. Let me take the driver's seat" [22, p. 393].

Since time immemorial, Yuval Noah Harari writes, life has been divided into two parts: a period of study, followed by a period of work. In the first part, you accumulated information and developed skills, in the second, you used them. Forget it. This schedule is over. "We have no idea what we will have to learn in 20 years. What we do know is that we will have to learn new things." Therefore, the best we can do is to prepare society for the constant updating of knowledge and skills [23].

Virtual education opens up new horizons, making learning more accessible, interactive and flexible. It blurs the boundaries between countries and cultures, allowing people from all over the world to learn together, exchange ideas, and create joint projects. Thanks to digital technologies, everyone can choose their own pace of learning, gain knowledge at a convenient time, and use modern tools to better absorb the material.

However, to truly take advantage of the full potential of virtual education, it is important to have digital skills. They help us not only to navigate the information space, but also to communicate, work and develop effectively. We can no longer imagine our lives without online communication, searching for information on the Internet, making electronic

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payments, or even socialising on social media. Digital skills give us confidence in the modern world, helping us to use technology for the benefit of ourselves and society.

Ultimately, the future is not just about new technologies, but about people who know how to use them to learn, develop themselves and improve their lives. And our task is to make this world not only technologically advanced, but also comfortable, safe and humane.

The development of digital technologies has dramatically changed the labour market, leading to the emergence of new professions and transforming existing ones. Most jobs now require at least basic digital skills combined with non-cognitive skills. The development of mobile technologies and cloud computing has established new forms of work organisation and led to the emergence of the third generation of virtual work, and the Covid-19 pandemic has made virtual work a reality for many. Therefore, digital skills are now not only desirable, but also necessary for success in any profession. Even professions that were traditionally considered "non-digital" now require a certain level of digital literacy.

In 2009, the UNESCO Institute for Statistics defined digital skills as "the ability to use digital devices, applications and networks to access and manage information" [24]. These skills allow you to create and share digital content, communicate and collaborate with others, solve problems and find creative opportunities. According to the Council of Europe's recommendation on key competences for lifelong learning, digital competence covers a wide range of skills that enable a person to use digital technologies confidently, critically and responsibly for learning, work and active participation in society.

It should be noted that digital skills are not only technical skills, such as the use of digital devices and software, but also the ability to think critically, analyse information, protect one's data on the Internet and use digital technologies effectively in all areas of life. Particular attention is paid to the ability to use digital technologies to support civic engagement, social inclusion and the achievement of personal and commercial goals. Digital skills are thus much more than just basic digital proficiency, as they also encompass critical thinking and problem-solving skills.

The EU's Framework for the Digital Competence of Citizens (DigComp) defines a list of digital skills needed to succeed in today's digital world. These skills are essential for competitiveness in the labour market, effective communication, online shopping and learning. There are two main categories of digital skills: general skills, which are used in everyday life and at work (for example, using a PC, tablet or mobile device to work with email

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or the Internet) and professional skills, which are intended for ICT experts (the ability to develop applications or program). DigComp defines 4 skill levels: beginner, intermediate, advanced and highly specialised [25].

Digital skills can also be classified into different categories, depending on the area of application: 1) basic digital skills - for active participation of citizens in the digital society; 2) professional digital skills - for successful work, in particular in the digital economy; 3) expert digital skills - for ICT professionals and other digital experts in various industries; 4) pedagogical digital skills - for teaching and learning digital skills throughout life.

In 2021, the University of Edinburgh named the five most important digital skills for learning. These are effective literature and source searching, data management, communication, software use, and cybersecurity. Bubble added two more skills to this list, which were mentioned in a thematic survey of experts by the American company Salesforce - word processing and data visualisation [26, p. 611].

According to the European Commission, only 54% of Europe's population has the digital skills needed for today's digital world. This means that almost half of the population does not have sufficient skills to fully participate in the digital society. In 2021, one in six Europeans aged 16 to 74 had no digital skills at all, and one in four had only a low level of digital skills. The Digital Economy and Society Index (DESI 2022) also showed that about 35% of European citizens do not have even basic digital skills [25].

According to a study conducted by the Ministry of Digital Transformation of Ukraine, the level of digital skills of the population tends to grow steadily. This is evidenced by a decrease in the proportion of adults with no digital skills and an increase in the number of people with "basic" and higher skills. As of 2023, digital skills were possessed by: 93% of the adult population of Ukraine aged 18-70, which is 8% more than in 2019; 95% of adolescents aged 10-17; 99% of people with hearing impairments aged 18-59 (+15% in 4 years). There is also a positive trend in the growth of digital skills among the adult population. The proportion of people with below-basic skills decreased from 53% in 2019 to 40.4% in 2023. This indicates that more and more people are mastering basic digital skills.

During the study period (2019-2023), 38% of the adult population mastered advanced digital skills. This is also a positive indicator, as it shows that a significant part of the population not only has basic skills, but also wants to develop further and master more complex digital tools. Overall, there has beensignificant progress in the development of digital skills among the adult population over the past 4 years. The proportion of people with

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below-basic skills has decreased by 12.6%, while the proportion of people with advanced skills has increased by 12.5% [27].

Deep transformations are turning work into global work, and communication is becoming instantaneous. We can get information at any time of the day, which changes the way we live and interact. That is why digital skills are becoming extremely important: they help us not only to adapt to new conditions, but also to be successful at every stage of our lives. In a world where the labour market is changing at a breakneck pace, the ability to learn quickly and adapt to new technologies is becoming essential for everyone.

One of the most impressive and rapidly developing technologies is artificial intelligence. From working with large amounts of data to the ability to make complex decisions or interact with the world around us, artificial intelligence is doing things that seemed impossible just a few decades ago. Today, it is already having a significant impact on medicine, transport, manufacturing and many other areas, changing not only the way we work, but also the very idea of how we can live and work in the future.

However, one of the biggest questions this development raises is about consciousness and self-awareness. Can a machine have a consciousness like ours? This is not just a theoretical question - it is a question that directly affects our future as a society. On the one hand, we can believe that consciousness is something that is inherent only in living beings. On the other hand, there is a belief that the physical processes in the brain that enable consciousness can be replicated in artificial systems.

Regardless of whether artificial intelligence will ever be self-aware, we are already facing ethical and moral issues. After all, what will happen if a machine starts to understand its existence and influence the world around it? Can we allow the use of such technologies in situations where it could harm people? This poses an important challenge for us - to develop artificial intelligence in a way that serves the benefit of humanity rather than harm it.

Researchers believe that artificial intelligence cannot have consciousness and self-awareness, as they believe that these abilities are related to the biological nature of human mental activity. Other scientists believe that an intelligent machine can have consciousness and self-awareness because they believe that these abilities depend on certain physical processes, such as electrical signals in the brain. These researchers believe that if computers can have electrical signals that are similar to those in the human brain, then they can have consciousness and self-awareness [7].

However, regardless of whether an intelligent machine can have consciousness and self-awareness, the question of ethics and morality of

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using artificial intelligence technologies arises. If a machine is aware of its existence and interaction with the environment, questions may arise as to whether it can be used to solve tasks that may cause harm to human life and health.

For this reason, it is important to ensure that artificial intelligence is developed with ethical and moral standards. This can be beneficial and safe for human society. In addition, it is important to ensure a balanced development of artificial intelligence and human mental activity in order to preserve the main thing - human uniqueness and creativity [28].

It is known that the use of artificial intelligence can lead to some serious problems. For example, the automation of routine operations may lead to a reduction in the number of jobs held by people. People's privacy may also be violated through the collection and use of their personal data. In addition, Deepfakes technology can be used to create fake images and videos, which can lead to serious consequences. There is also a risk of using automated weapons that can target living objects without the control of human operators. In addition, artificial intelligence systems can make incorrect and biased decisions due to incorrect training data and algorithmic bias [29].

Indeed, the risks associated with artificial intelligence reflect mainly the actions and decisions of the people behind the development, training and application of these systems. This means that the responsibility for managing these risks lies with people who understand the capabilities and limitations of artificial intelligence. Therefore, it is important to ensure the ethical and responsible development of artificial intelligence technologies, as well as to ensure that a wide range of professionals and civil society organisations are included in discussions and decision-making on the use of these technologies.

The future of humanity depends on how artificial intelligence is used. There is a risk that artificial intelligence systems can be used for total control of people, which threatens to lead to loss of privacy and jobs, as well as automated weapons and falsely biased decisions due to algorithmic bias. However, there is also the possibility of using artificial intelligence systems to free people from routine and channel their creativity. We must understand that the responsibility for the use of artificial intelligence lies with people, and it is only our wisdom and understanding of the possible consequences that will determine which path of the future we choose [29].

This issue is of particular importance for new generations growing up in a world where technology is literally penetrating all spheres of life. Generation Z, alpha, and those who will emerge in the future are already born and raised in the digital age, for whom technology is not just a tool but

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an integral part of their existence. These generations not only observe the changes, but also actively use them, adapting the latest technologies to their everyday needs - in learning, creativity, and communication. However, the development of new technologies also brings new challenges: for example, a superficial perception of important aspects of life, a decrease in critical thinking, which can lead to a loss of depth in perceiving the world.

It is these generations that have the potential to become the driving force behind the development of ethical standards for the use of artificial intelligence. They can find a delicate balance between technology and preserving human uniqueness, creativity, and even emotional intelligence. The ability not only to adapt but also to preserve humanity in this technological world will be the key to a future that can be not only technologically advanced but also ethically mature.

But, as reality shows, the development of artificial intelligence also poses serious challenges. Automation certainly has its advantages, but it can also deprive people of their jobs, creating new social and economic inequalities. Technologies like Deepfake can turn tools for manipulation into a real threat to trust and truth. Privacy issues, the use of automated systems to make decisions without human intervention - these are all real threats that are already affecting our lives.

However, it is important to realise that these risks are not inevitable, as they arise from human decisions. Technology is a tool, and it's up to us to use it. We can create artificial intelligence that will make our lives easier, safer and more creative, but we need to set ethical boundaries. The challenge is not only to develop technologies, but also to develop our ability to use them responsibly, while keeping in mind our humanity.

As Klaus Schwab's research shows, as well as ethical approaches being developed within the UN and other international organisations, we must learn to build strategies for the development of artificial intelligence, focusing not only on efficiency but also on the good of humanity. Technology can and should serve people, not replace them [30].

Ivan Yefremov's prophetic novel The Hour of the Bull contains important reflections on the future of humanity and technology. The novel depicts two civilisations that resulted from different approaches to the development of technology. One of them is a world where technology is used for total control over humans, and the other is a world where technology promotes freedom of creativity and development. Although the novel was written more than half a century ago, its ideas are still relevant today [31].

Efremov warns us that if we do not preserve our individuality and freedom, technology can become a tool of control. But there is another

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possibility: we can use them for development, for making life easier, for enhancing our creativity. The choice is ours. How we interact with technology will determine what our future will be like [31].

And it is here that it is important that we as a society can maintain a balance between the use of the latest achievements and the preservation of our ethical principles and human values. This is the only way we can create a just and harmonious world where technology will serve the benefit of all people.

Conclusions. Society 5.0 is no longer a distant vision but a reality actively unfolding in the contemporary world. We are living in an era of accelerated technological transformation, where artificial intelligence, NBIC convergence, mixed reality, the metaverse, and digital competencies have become integral to everyday life. The critical factor shaping this new stage of civilization is not merely technological advancement but society's capacity to integrate innovation into culture, ethics, education, and interpersonal relations.

Humanity has always sought to expand the boundaries of possibility, and today it possesses tools that can not only enhance the quality of life but also redefine its very essence. The metaverse offers new dimensions of communication, creativity, and labor while simultaneously blurring the distinction between the real and the virtual. NBIC convergence provides unprecedented opportunities in medicine, science, and industry, yet it also raises profound ethical questions regarding human agency, identity, and responsibility.

Among the most significant dimensions of these transformations is education. Virtual and hybrid learning environments are reshaping access to knowledge and redefining the meaning of being an "educated person." In the digital era, the essential competencies extend beyond traditional literacy to include digital fluency, critical thinking, ethical awareness, and lifelong learning. Digital skills have become a prerequisite for full participation in social and professional life.

However, technological progress must be accompanied by a critical understanding of its consequences. The ethical challenges of digital civilization – privacy, data security, equitable access to technology, and responsible use of artificial intelligence–require urgent and coordinated responses. Innovation must serve humanity, not replace it. Achieving a sustainable balance between technological advancement and humanistic values is essential to ensuring social well-being and justice.

New generations–Z, Alpha, and digital natives–are growing up in an environment where technology shapes cognition, communication, and

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socialization. They demonstrate high adaptability, multimodal communication, and an intrinsic connection between physical and digital realities. This necessitates a paradigm shift in education: learning must be more interactive, personalized, and ethically grounded, fostering not only technological competence but also conscious and responsible engagement with digital environments.

The digital-born generation represents not merely a demographic shift but a new phase in human evolution. They embody immense potential for creativity and social transformation while simultaneously demanding greater attention to the ethical and humanitarian dimensions of technology. The future will depend on our collective ability to merge innovation with humanism, creating a digital civilization that is both technologically advanced and socially inclusive.

The study of Society 5.0 illustrates how digital technologies reshape work, education, communication, and even human perception of reality. While these processes introduce new inequalities and ethical dilemmas–such as limited access to digital infrastructure, erosion of privacy, and the changing nature of labor–they also open vast opportunities for human development. The path forward lies in cultivating digital ethics, promoting responsible AI, and designing educational systems that prepare individuals for a rapidly evolving world.

In essence, Society 5.0 embodies a new civilizational paradigm in which the harmony between humans and technology defines the trajectory of progress. Technologies must serve human flourishing rather than supplant it. Digital ethics, inclusivity, and education constitute the foundational principles of sustainable digital development. The future belongs to those who successfully unite innovation with humanity, ensuring not only technological sophistication but also moral integrity and social harmony in the age of intelligent technologies.

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