

UDC 631.171

Review paper

Received: -

Acceptee: March 18, 2021.

Corresponding author: maja.andjelkovic@fti.edu.rs

# MAN IN THE FOURTH INDUSTRIAL REVOLUTION

**Maja Anđelković**

*Faculty of Information Technology and Engineering, Union-Nikola Tesla University in Belgrade*

**Dragana Radosavljević**

*Faculty of Information Technology and Engineering, Union-Nikola Tesla University in Belgrade*

**Života Radosavljević**

*Faculty of Information Technology and Engineering, Union-Nikola Tesla University in Belgrade*

---

**Abstract:** *Abstract. Technological changes, aided by the great crisis of the Covid - 19 pandemic that hit the world on a global level, have fundamentally changed the design on a global, but also on a national, ie organizational level. Technology is advancing at a rapid pace, and the pandemic crisis is still not under control, which increases risks and stability in the spheres of life and business. Changes are still happening at such a speed that it is difficult to follow them, let alone adapt them. Uncertainty in unstable living and working conditions is increasing, which imposes the need for the emergence of special scientific disciplines, and especially risk management in various fields.*

*Technology has taken over many functions of man, with a tendency to question his place and role in social and business life. IT experts are already talking about neural networks, smart machines, intelligent rooms, and even smart cities.*

*The fourth industrial revolution is widely present in developed countries, and the crisis of the Covid - 19 pandemic accelerated the process of de - alienation, redesigned jobs and jeopardized the survival of individual professions, but also traditional organizations, jobs and the life of the population as a whole. In these circumstances, the question arises whether the place, role and influence of man in the fourth or subsequent revolutions will be marginalized, or whether man will be excluded from business processes and what will be the relationship between people, organizational systems and countries globally .*

*Forecasts on these issues go in two directions. The first direction claims that in the fourth industrial revolution the place and role of man will increase, while the second approach predicts that in the fourth and subsequent revolutions the role and importance of man will decrease.*

*The answer to the second question, ie what will be the relationship between people in the fourth industrial revolution, is harder to predict, given that advanced, and above all information and communication technologies have dramatically changed traditional jobs, ie time, place and way of doing jobs. Here, as in the previous question, two claims are made: that the socialization of man and society will increase in the fourth industrial revolution, as opposed to the views that man will experience alienation, and that he will eventually lose one of his basic characteristics, and that is his social character.*

*The paper deals with the question of the place and role of man in the fourth industrial revolution, as well as human relations, and above all interpersonal relations, which in the knowledge society are considered one of the main factors of social and economic development. The aim of the paper is to try to solve the dilemma of man against intelligent machines, ie man as a social and individual being, or a robot.*

**Keywords:** *Keywords: Man, The Fourth Industrial Revolution, the relationship of man to man in the Fourth Industrial Revolution, the future of man.*

---

## 1. INTRODUCTION

Man, as the only conscious and rational being, is studied within the framework of sociology, psychology, organization, management, knowledge economics and other branches of human sciences. It is shown that man is studied insufficiently, partially with a one-sided approach, ie that he is still treated and studied as: a factor of production, ie business, which still shows great dominance of classical organizational and management sciences.

On the other hand, there is a large discrepancy between the theoretical and practical aspects of considering this issue. In the literature on human resource management, it is almost a rule to talk about people as the most valuable factor of any organization, and interpersonal relationships are considered key to achieving organizational success.

When we analyze the regulations that regulate the work of people in the organization, as well as the procedures of management towards people, sanctions imposed on employees, as well as the relationships that exist in organizations, we come to devastating results. This statement is not changed by the effort not to talk about man as a business factor in certain sciences, such as management, but as human potential, thus trying to remove the traditional treatment of man like other business factors, and thus remove any doubts about the importance of man in the organization.

It turns out that in many organizations there are clear plans for overhaul, maintenance, replacement of existing parts, assemblies and subassemblies, ie technologies and tools, that they are recorded and valued in the balance sheets and assets of organ-

izational systems, but on the other hand people are not valued, their knowledge, skills and abilities. All of the above is happening in the society and knowledge economy, that is, in the fourth industrial revolution created by man who should transform it into the fifth industrial revolution.

In bureaucratic and traditional organizations, man is mostly a number. Management does not know enough about a person, his characteristics, but management also does not know enough about himself, which makes it even more difficult to work and communicate with people, ie employees. The question is how people can be managed successfully, if their features are not known, because it has been scientifically proven, and everyday practice shows and proves that getting to know each other is the first step in mastering, and this is a condition for successful management.

Experience shows that in classical organizations, a person's physical ability and loyalty are valued more than his intellectual potential, ie his emotional and motivational intelligence, which are a condition for success in modern, ie knowledge society. The reasons for this are the marginalization of social sciences in business colleges, and especially the absence of subjects such as working with people, socio-psychological, organizational, subjects in the field of ethics and social responsibility, etc. This shortcoming is one of the main causes of numerous deviant phenomena and destruction in modern society on a global level, given that technical and certain natural sciences, ie techniques and technologies, have taken precedence.

The fourth industrial revolution has mechanized numerous jobs that man was engaged in, because it turned out that the machine was more reliable for performing routine, repetitive and unhealthy jobs. With the introduction of machines, productivity and business economy increase, but interpersonal relationships should also improve, not only because of the reduced number of live work in business processes, but also because the machine does not require a hot meal, a nice word or good communication. , ie sanctions by the manager. The machine functions as man constructed it, and when he wants to change its program, it must again, as Tesla says, occur in the human neocortex.

However, advanced technologies, ie artificial intelligence, which was generated by the fourth industrial revolution, significantly changed the business environment, but also the relationship between man and machine, because it fundamentally redesigned the workplace, as well as organizations. This imposes the need to change the technology of organizational behavior, jobs of all types of management, but also redesigned management verticals, because the middle management will certainly disappear, or its stratification will be reduced. It is not necessary to explain what the

above means and what it will mean for people, organizations, but also for the world on a global level.

## 2. MAN AND THE FOURTH INDUSTRIAL REVOLUTION

In order to analyze the relationship between man and the fourth industrial revolution, it is necessary to point out their conceptual definitions. This is a pre-condition, because the framework in which each analysis can move depends on it, but also on the quality of possible answers and the derivation of appropriate conclusions and laws. Explaining and describing the basic characteristics of man is often neglected in the science of management, leadership and leadership, because it is often thought that we are all human and there is no need to deal with this issue, although it has been proven that self-knowledge is “the longest, but also impossible” the path a man should take. The situation is similar with the definitions of the industrial, and especially the fourth industrial revolution, which at the end of the last century gained the right of legitimacy in developed countries, and then in the scientific and professional literature, although it is difficult to talk about the revolution.

Regardless of the difference in approach to these phenomena, the basic characteristics of man and the peculiarities of the fourth industrial revolution will be further discussed, as an environment in which man will live and work, that is, realize his mission. The challenge is even more complex when we keep in mind that technologies and concepts change quickly, and that man is less susceptible to technological and other changes and that he is often ready to resist planned changes, ie their implementation, especially if they bring into question his interests.

Man is first and foremost a social being. He has been that since his inception and will remain so as long as civilization exists. Therefore, a person cannot survive without socializing and living with other people, which is a feature of other animals, which not only feel safer in a group or collective, but by acting together they can more easily ensure their survival. What has changed throughout history are the ways in which that sociability is established, which depended on the acquired skills and experience, and later on on knowledge and technology as applied knowledge. Thanks to socializing with other people, man has survived, because man has neither great strength nor great speed, strong jaws and sharp eyesight, or hearing, as other animals have. A person in a group, ie a collective, manages to secure his survival more easily, and in the age of knowledge, by exchanging or sharing knowledge, he manages to fa-

cilitate his own survival through technological inventions. That legality will continue in the fourth and further revolutions.

The second characteristic of man is that he is a being of interest, whatever this characteristic means and regardless of the parameters through which that interest is realized. This means that a person as an individual follows his interests and is ready to sacrifice himself primarily for his interests, goals and descendants. This is important to mention, because without interest there is no joint work, not even organizations as interesting creations. Thus, the following conclusion is reached that organization is a tool that people use to be more successful in their work, because it has been proven that “joint work is always more successful than a simple sum of individual works”. That is why man, that is, people, are ready to give up their individual freedoms, to unite in the organization and expose themselves to restrictions through technical-technological regime, rules and control, because this sacrifice, conditionally speaking, brings significant benefits in business. (Vučenović, 1998).

The third characteristic of man is his mentality, that is, reason, or mind given to him by nature. No other living being has this characteristic. Man has mental energy, which drives mental activities, and these produce ideas as the most valuable potential of any organization.

The most important part of human mentality is emotional and motivational intelligence, which are concentrated in the human neocortex and on whose balance depends the quality of ideas, ie the quality of the thought process to create and then realize created ideas. Understanding man as an emotional being is important for his modern understanding, because classical organization and management started from the position that emotions and feelings must not be brought into the organization, because work is exclusively rational and a phenomenon that must not be subject to emotions.

Related to the above is the fourth industrial revolution as an environment in which a person lives and works, ensures the quality of his life and the life of his family, but also society as a whole. There is controversy about this phenomenon, because it is believed that in the fourth industrial revolution no revolutionary changes took place, such as the invention of electricity and replacement for internal combustion engines, or from the transition from agrarian to industrial revolution, or the emergence of a managerial revolution. For the first time in their history, they peacefully handed over the right to run their business to people outside their own tribe, which in modern literature is referred to as the managerial revolution. This was a rare radical change,

that is, a revolution that was carried out without conflict and “blood”, but voluntarily, in order for the owners to be more specific in the market.

The fourth industrial revolution, called Industry 4.0, has changed people’s lives and work dramatically. It involves creatively upgrading existing technologies with new and more advanced ones, rather than introducing radically new technologies. It represents the permanent improvement of traditional production, transport and other processes with the use of smart techniques, technologies and concepts. So, Regardless of the different approaches, in the fourth industrial revolution there is a “merging of the physical, digital and biological worlds in ways that create huge promises and potential benefits, but also potential dangers. The speed, breadth and depth of this revolution is forcing us to rethink how countries develop, how organizations create new values, and even what it means to be human.” (Fourth Industrial Revolution, 2021)

It is important to emphasize that the fourth industrial revolution does not mean just a simple change, ie the introduction and application of new and advanced technologies, but an industry that should create the future. It is focused primarily on man, on his quality of life, and thus on the extension of man’s lifespan, as one of the basic goals of every living being. This indicates that new, ie smart technologies are not a goal, but tools for easier and faster achievement of defined goals.

### **3. MAN AND (OR) MACHINE IN THE FOURTH INDUSTRIAL REVOLUTION**

What the fourth industrial revolution brought us in relation to the third industrial revolution is a legitimate question, insofar as every technological progress brought progress, that is, it facilitated human life and work. Although the answer is complex, we can say that in the “third industrial revolution, man was the master of machines. He wrote the code and told the computer and the machine what to do. He played computer games as a favorite pastime. This was a digital revolution, which had multiple benefits.” (Podder, 2017.)

In the fourth industrial revolution, machines have become more intelligent and man could hardly learn from machines, but there is a trend for machines to teach and transform man, giving him orders or instructions, making him a digital man, or a slave man, or a robot, or a bot. Artificial intelligence has developed faster than any other industry and as such will rapidly change man and his attitude towards advanced technologies.

The previous statements are not without basis, which brings into question the place and role of man in the future society, that is, in the fourth industrial revolution. In other words, there is a dilemma whether man will disappear from business and other processes in the fourth industrial revolution and whether his place and role, ie numerous actions, jobs and tasks will be taken over by machines, robots, smart devices, or artificial intelligence.

These issues are legitimate because it is known that smart devices, organizations and cities have emerged, as well as entire regions where knowledge and new technologies are created, ie tools and weapons that more successfully and reliably replace human labor, especially when it comes to difficult and human health dangerous jobs. A smart weapon has been created that can identify the target and program its realization, ie destruction, without the participation of a man, ie a soldier. Digital leaders have emerged who use platforms as a basic tool in their work. (Dedić, 2019. p. 214 - 215).

The fourth industrial revolution will change the society, its structure, economy, jobs, jobs, time and place of doing business. It will inevitably change a person and transform him from a classic man to a person who will live with changes and technologies. It turns out that the most difficult thing will be to change a person, that is, his habits, professional work, behavior and actions, which are often imposed by new technologies.

However, the place and role of man in the fourth industrial revolution is not in question, as it is often thought and as it is presented by experts in the field of advanced information and communication technologies, artificial intelligence, robotics, etc. On the contrary, the place and role of man of knowledge will increase in the future, while the man of ignorance, ie people who do not have the appropriate professional competencies, will disappear; we can say that their survival is questionable.

The arguments for the above statement are numerous: historical, sociological, organizational management, psychological, economic, etc.

Historical arguments for the decisive place, role and influence of man in the fourth industrial revolution are often underestimated, although they show the development of human civilization so far, regardless of the fact that in modern conditions it is impossible or very risky to extrapolate the future based on the past. Precise analyzes show and prove that man, in every new time dimension and in all elements of business processes, changed the ways and technologies that ensured his own survival, from the agrarian, through the industrial to the information age. The classics

of Marxism determined that in those epochs it was not decisive what man produced, but by what means of labor he achieved it. The same thing happened and is happening in the era when man used the power of his muscles, through the use of primitive tools and accessories, mechanization, robotization to the application of information technologies and artificial intelligence tools. Thus, the ideogram and laws of development of society went from manipulation, through mechanization, mechanization, automation, informatization to the period of artificial intelligence and knowledge, ie wisdom as the highest degree of ability that integrates knowledge, experience and skills. (Anđelković, 2018, str. 51- 57.)

In all phases of human development, man was a constant element of all epochs, because man, with his experience and knowledge, improved business and other processes, that is, productive forces. When the productions of power, that is, when man with his tools and knowledge was more advanced in relation to the existing production relations, there was a change in relations, that is. transition from one epoch to another: from the original community to slavery, from slavery to feudalism, from feudalism to capitalism.

Today, civilization is in capitalism in its most developed phase, which is characterized by knowledge as the most important resource. That is why we have introduced a new word - the knowledge economy as the most important resource, ie the potential of every country or organization. So, man was and still is the most important factor in life and work, and that will remain so in perspective. He is at the same time the best computer, because the scientist Werner von Braun states: "Man is the best computer that controls rockets and satellites and the only one that is mass-produced by unprofessional procedures."

The second argument is an economic, but also organizational and management fact. Namely, machines were created by man. They are the result of human thinking, that is, mentality and ideas. They function the way man imagined, designed and built them. Nikola Tesla says: "Each of my inventions was exactly as I imagined it in my head. When I wanted to change the way it worked, it came to my mind again." This clearly states that nothing arises from nothing, but everything is a matter of ideas and organization.

The third argument is based on evidence and indicates that the introduction of robotics and artificial intelligence will free a person from physical, manual, hard and often life-threatening work. At the same time, a space will be created for man to deal with what only man can deal with, and that is the creation and conception of ideas and their realization. It turns out that the more a person gets rid of manual and tir-

ing, but also boring work, the greater the potential for ideas and the emergence of innovations. Steve Jobs rightly stated that the computer is an effective means by which we can increase a certain part of our intelligence. This inevitably brings an increased number but also the quality of innovations which leads to the digital economy. (Atkinson and Ezell, 2014).

Although it is evident that man will continue to be an indispensable factor in every action or inaction, research shows that people and organizations are not ready to accept the challenges posed by the fourth industrial revolution. Leaders or management are also not ready to use the full potential of Industry 4.0, and in transition countries societies or organizations are still living in the early industrial revolution. This was confirmed by Deloitte's research on a survey of 1,600 executives. Management is simply not ready to make business decisions for investments that suit Industry 4.0; this is due to their short-term focus, ie the lack of long-term strategies and appropriate programs. It turns out, as Sydney Harris says, that "The real danger is not whether a computer will start thinking like a human, but whether a human will start thinking like a computer."

There is no need to explain how much damage is done in this way to clients, but also to organizations and society as a whole. The challenge is more complex, if we keep in mind that changes happen much faster, that there is a shorter lifespan, ie product and technology cycles are getting shorter and shorter.

#### **4. MAN TO MAN RELATIONSHIP IN INDUSTRY 4.0**

Previous industrial revolutions have had a great impact on all spheres of life and work. In the previous revolution, we grew, got educated, worked and lived in conditions of competition. Competitions in which man was engaged for his own survival, or progress were often very drastic. Economic science has taught and still teaches generations that competition, that is, competitive ability, is a key factor of organizational success. Sociological and psychological analyzes indicate and prove that competition has a destructive effect on society because it creates conflicts, ie where there is no cooperation, assistance, empathy. This raises the dilemma of competitiveness and conflict versus cooperation and agreement. This dilemma is analogous to the dilemma of life and health or the economy and progress in the crisis of the Covid - 19th pandemic and is the result of a partial observation of life phenomena and the absence of a holistic concept in the study of dynamic phenomena. It is clear what should be

given priority in times of crisis, but also in normal times. (Radosavljević i Vučenović, 2014, str. 133-134).

Thus, with the industrial revolutions, the lives of man and the whole society are fundamentally changing. Technological tsunamis, like major floods, are destroying lives, families and companies, but they have opened up new opportunities and perspectives for many. The crisis of the Covid-19 pandemic took a large number of victims on a global level and put the medical profession, ie the medical profession, in front of serious challenges. On the other hand, during the pandemic, there was a rise in digital technologies, distance learning, e-commerce, e-banking, and work from home. The national nomenclature of professional occupations has changed radically, and higher education institutions are already preparing staff and professionals who will perform jobs in 2050 and later, which was unthinkable only two decades ago. Of course, this must be followed by lifelong learning in order to acquire new skills for the economy of the second half of the 21st century. (Podder, 2019).

Brojne kompanije u razvijenom svetu su otvorile vrata tehnologiji, odnosno veštačkoj inteligenciji. Pokazuje se da ni ti sistemi ne mogu funkcionisati bez živog i u isto vreme kompetentnog čoveka, jer mašina bez čoveka zaista ostaje veštačka tvorevina, jer ne može da misli, odnosno nema kreativne sposobnosti koje poseduje čovek. Numerous companies in the developed world have opened the door to technology, ie artificial intelligence. It turns out that even these systems cannot function without man who is at the same time competent man, because a machine without man really remains an artificial creation, because it cannot think, that is, it does not have the creative ability that man possesses.

In this context, the fourth industrial revolution will bring to the fore the human-to-human relationship, instead of the classical approach in which the human-machine relationship was at the forefront and where the clockwork, performance and norms were the basic criteria for assessing and evaluating personal, but also organizational success. In other words, the machine controlled man and programmed his actions, procedures, speed, movements like a robot. It turns out that being a robot is more dangerous than being a slave, because a slave still has some freedom, while a robot relentlessly imposes its constructional and determined rules and ways of working.

Although today it is almost impossible to imagine the functioning of a person, but also an organization without the application of artificial intelligence, in the future, the general challenge will be the relationship between man and man. This threat is certain, because intelligent machines and devices enable work from a distance and

without physical closeness to another person. Man has at his disposal a huge depot, ie databases that can be used to make life and work decisions, which is why the principle of exchange and sharing of knowledge in the new conditions is called into question, because there are databases that can be used more successfully than exchange and sharing of certain information.

The extent to which artificial intelligence is represented in making individual decisions can be seen by the fact that a modern soldier is also equipped with technology that scans a certain environment and situation, sets goals and makes decisions for their realization. The soldier is not waiting for an order from a higher command, there is no manager to consult with, but no other soldier to exchange his information and consult about making the appropriate decision. Already in this example, it can be partially seen that artificial intelligence takes over the role, or has a large share in making the appropriate decisions that a person should follow. However, the realization and creation of such deterministic decisions remain in the competence of man, because it is shown that artificial intelligence knows the answers to known questions, but does not know how to ask questions according to different and unprogrammed situations and events.

The fourth industrial revolution must also influence the transformation of man in the direction of preparing people to communicate with technology, but also to prepare man to communicate and act with other people in a new and dynamic digital environment. This is all the more so because man cannot do without machines, robots and digital systems, but neither can a machine be without man. In other words, “man plus machine” is the formula for modern success. (Wilson and Daugherty, 2019).

In that, the young generations establish new rules, where socialization must be realized in a different way, ie that physical distance and work from different spatial points does not mean a lack of socialization. It is difficult in modern conditions to claim that mass concentration in production halls during strict technical and technological regimes establishes socialization of employees, especially in conditions where there is a low level of technical load and a high level of physical and mental exhaustion, which leads to alienation of man from his essence. and nature.

Thus, the introduction of digital economies reduces the consumption of physical energy, creates a larger fund of free time that can be used for sports, entertainment, culture, do it yourself, or use digital technologies to communicate with friends, business partners, and do business together in real time. from different points of the globe. This is especially true in conditions when information and communication technology is becoming more advanced, but also cheaper, with increased capacity

and speed. It is already evident that more frequent communication takes place between family members from Serbia and Australia, than it was when a family member was in Serbia. There are examples of family members from the country and abroad exchanging, seeing and communicating, exchanging messages even more often than they did when they were in Belgrade.

Today, there are virtual fairs, economic exhibitions, digital museums, theaters, and even digital, or machine, or distance learning. Information technology has enabled surgeons and other specialists to observe, study and enter the world's most elite hospitals, ie halls, and learn how the most complex operations are performed, from the world's best surgeons. However, it is shown that the role of the surgeon will be taken over by robots and that surgical procedures can be performed remotely over the Internet, ie that the surgeon is on one continent, and that the patient is in a small place, provided he has the Internet. What this means for man and civilization in general, does not need to be explained. (Kaku, 2011. str. 82).

The advanced technology of the fourth industrial revolution turned many economic activities and branches into a kind of industries, such as banking, tourism, services, and other industries. Hence the statement that there is no justification that someone does not know something, or that educational, cultural and other institutions are not available to him, because almost everything is available now, if a person has the Internet and mobile phone and the desire to learn and willingness to share knowledge with others people.

Further, pPhysical concentration and presence in modern conditions becomes a burden, especially when it comes to different generations, due to the existence of the so-called generation gap. Calling, or communicating remotely when the need is felt is far better and less burdensome than when there is a constant presence of even family members. In organizations, it is even more dangerous, because working in the same organization, on the same jobs, in the same environment, with the same people and managers is not only boring, but also unacceptable for human productivity and health. In other words, instead of collectivization, the fourth industrial revolution brings individualization, but also the problem of desalination, if the contents that will be used in free time are not designed.

Hence the need to train managers who will manage non-work, ie free time, instead of educating business managers and leaders, because this will be a bigger problem than managing organizations in which a technical-technological regime can be set that will solve certain problems through sanctions or incentives.

It is estimated that the human-to-human relationship in the fourth industrial revolution will be more humane and with less mutual conflicts, because the possibility of mutual “friction” due to physical distance in performing jobs and work tasks is reduced. Conflict as a phenomenon will not disappear with that, but it will be transformed into a conflict between man and machine in which the machine will try to limit or eliminate the logical thinking of man.

From the above it can be clearly concluded that a person in the fourth industrial revolution will have better socialization, because he will work when he wants, rest and digitally communicate when and with whom he wants, and in his spare time through sports and recreation, ie entertainment, tourism, etc. he will socialize with the one with whom he shares certain systems of values and inclinations.

## **5. WHAT WILL THE FIFTH INDUSTRIAL REVOLUTION BRING REGARDING MAN?**

Each industrial revolution brought new technological advances on the one hand, and new products and services on the other.

It turns out that of the five industrial revolutions so far, each subsequent one was created in the lap of the previous one and that, as a rule, it was more advanced in terms of technology, product, quality and length of life than the previous ones. While the first industrial revolution was characterized by mechanization and the emergence of factory systems with mass employment, in the second industrial revolution, new technologies marked as electrification, ie. introduction of electricity. The third industrial revolution was followed by automation on a global level, and the fourth industrial revolution is dominated by digitalization.

The Fifth industrial revolution, or Industry 5.0. means personalization, ie the introduction of artificial intelligence that will be in the function of the individual. It is a continuation of the fourth industrial revolution in which artificial intelligence is being revolutionized with the potentials of quantum computing that will unite man and machine in the workplace. What distinguishes the fifth from the fourth industrial revolution is “the humanization and introduction of best practices in technology and innovation that are returning to the service of man, especially among the leaders of the fifth industrial revolution, ie industry 5.0. (Joseph, 2020).

In addition to the humanization of man and the return of technology in the function of man, another key word is quantum computing, which was pointed out

by Michio Kaku in the second decade of this century, pointing out that man will face the problem of computer minimization in the second decade of this century. Richard Feynman: "How small a machine a man can produce." (Kaku, 2011, p. 174). With the minimization of computing, its power will increase, but also its speed, which will make a person's life and work easier, but it will also become an inseparable part of human needs.

Of course, in the fifth industrial revolution, with the advancement of artificial intelligence, human potential will increase. It is estimated that the human resources management sectors will be strengthened with ethics experts to guide individuals and organizations to use new technologies for human benefit. This is important to mention, because it turns out that the third and fourth industrial revolutions produced numerous problems when it comes to nature, from climate change, or environmental damage, that man had to adapt to new technologies, to the race for profit that threatened non-renewable resources. and questioned the survival of man, but also of other living beings. That is why in the fifth industrial revolution, ecology will come to the fore, but also ethics, that is, social responsibility.

Each subsequent industrial revolution had a shorter lifespan than the previous one. Thus, close to 200 years passed from the first to the second industrial revolution. The second industrial revolution took place in the second half of the eighteenth century until the beginning of the First World War, which is a period of about 60 years. The third industrial revolution took place around the 1980s and lasted until the beginning of the third millennium, when the fourth industrial revolution took place, which lasted until the end of the second decade of the new millennium, ie two decades. The fifth industrial revolution will begin in the early 2020s and is estimated to last about 8 years. Regardless of the accuracy of the period of occurrence of individual industrial revolutions, the conclusion is clear that each subsequent industrial revolution lasted significantly shorter than the previous ones. This trend will continue in the future, which means that the speed and radicalism of change has gained in importance and that these phenomena will continue to accelerate and radicalize.

The previous facts are important for man, because in each new industrial revolution, man will have to change more often, that is, adapt to new technologies, products and living and working conditions. The human resources sectors will change their job descriptions dramatically. According to Forbes research, "over 34% of leaders in human resource management invest in learning the workforce and retraining them for future jobs." Change will become an integral part of every person and organization, and developing a culture of living and working with change will be a special

challenge for the human resources management sector. The integration of the technical, development and human resources sectors should also be expected, in order to systematically manage these phenomena.

The role of human intelligence will increase as never before, especially the development of emotional intelligence, ie the development of human desires and needs as a nucleus for the development of motivational mechanisms, so that desires through motives turn into the satisfaction of needs. With the above, a better perspective should be opened for creativity, empathy and establishing a balance between man and technology, in which the machine will be a good friend and tool to man, but in which man will always have the primary place.

Distance working, working from home, changes in the technical-technological regime, reduced friction of employees, reducing the importance of teamwork, putting women in a more favorable position and strengthening their employment in business organizations, are realistic predictions that will happen in the fifth industrial revolution. "If women and girls are trained to run campaigns for the prosperity of man, all other elements of the revolution will grow." (Gauri and Van Eerden, 2019).

Another important feature is that the emergence of new industrial revolutions did not completely eliminate the previous industrial revolutions. This statement is especially valid on a global level, because it is shown that in modern conditions in some parts of the world, the second, and in some places the first industrial revolution has persisted. The first industrial revolution has not yet taken place in developing countries, because production is done with primitive means of work far from mechanization.

In the fifth industrial revolution, artificial intelligence will be improved, which will lead to increased humanization of life and work, but also labor productivity. It will enable individuals, but also organizations, to make faster and better management decisions. It is estimated that already today about 50% of employees use some form of artificial intelligence and that at the end of the second decade this percentage will be significantly higher.

Regardless of the different points of view, the fact is that the fifth industrial revolution will eliminate the dehumanization of man that objectively existed in the earlier industrial revolutions. It seems that in the fifth industrial revolution, a special challenge will not be represented by technological discoveries such as: bitcoin or artificial intelligence, but it will be humanity. There is no need to further explain how this challenge will affect the design of education and upbringing of future generations.

## 6. THE FOURTH INDUSTRIAL REVOLUTION IN SERBIA IN THE CONTEXT OF THE PLACE AND ROLE OF MAN

The wave of permanent industrial revolutions is present on a global level. This issue is dealt with not only by corporate systems, but also by states, united regions and state communities. Economic forums address this issue, as it has been established that the industrial revolutions have brought much good, but also that they have led and continue to lead to existential threats both in humanitarian terms and in environmental disasters, including times of crisis and Covid – 19 pandemic that hit the world at the end of the second decade of this century.

The Republic of Serbia, like other countries in transition, is not doing enough on this issue. It is estimated that these countries are still in the third industrial revolution, and many developing countries are in the agrarian age with primitive technologies and poor quality of life. In developing countries, the first industrial revolution dominates, based on the power of water and steam in mechanizing the process of work and production.

The third industrial revolution that exists in Serbia is at the level of the 1980s, in which digitalization, personal computerization and the Internet still do not dominate enough. The road to the fourth industrial revolution was followed by databases, robotics, blockchain and crypto, why computer or digital literacy is needed, but above all the dominance of highly educated people. It is clear that in a country that has about 10% of the population with university degrees, one cannot even talk about the third industrial revolution in full capacity, let alone about the fourth industrial revolution.

According to the Global Innovation Index as a parameter in assessing the development and improvement of industries, Serbia is 55th among 129 countries, which means that it has moved up 13 places compared to the ranking from 2017, when it was 62nd. That is not very comforting, because Serbia is placed 26 places behind Slovenia, 13 places behind Croatia, 12 places behind Montenegro. In some details, this lag seems more dramatic when it comes to cooperation between universities and industry, in the development of scientific and technological clusters in the import of high technologies, in energy efficiency. (Milošević, 2019).

This leaves serious consequences on the elimination of dehumanization of man and society as a whole, but also on the development of democracy, because it is known that each subsequent industrial revolution pushed the boundaries of democ-

racy in which man was freer and therefore more creative, since only a free man and democratic ambience make an innovative and productive man.

The fourth industrial revolution especially benefited customers, ie consumers. With its absence, the consumer is not able to access the digital world and thus increase personal and organizational success. The main changes that characterize the fourth industrial revolution, and which did not even begin in the Republic of Serbia are the following: (Tomić, 2018.).

- Growing transparency,
- Consumer engagement,
- New patterns of consumer behavior

Industry 4.0 is basically redesigning the classic business both on the production side and on the supply and demand side. Without these technologies, a person is not able to order a taxi, order food to be delivered to his home address, book and pay for plane or theater tickets, sporting events, e-commerce, e-banking, e-education, e-government, etc. This example already shows the advantages of Industry 4.0 and the loss due to the absence of this technology.

The problem of transition from the conditionally speaking third industrial revolution to the fourth is not only in the introduction and application of technologies that accompany this revolution, but also in the legal system of Serbia, which is not able to follow the rapid progress and transformation of certain activities in which advanced technologies are applied. In other words, “legislators are increasingly proving to be incapable” of coping with the rapid changes imposed by the fourth industrial revolution. The example of unregulated, or insufficiently regulated tax status of freelancers in Serbia confirms that, but it is also confirmed by the practice in which the technologies of the fourth industrial revolution are applied, and that the legal regulations are delayed for several years.

Hence the necessity to include lawyers, economists, ethicists, human rights experts and other experts in the conception of the strategy of introducing the technologies of the fourth industrial revolution, in addition to engineers. Reducing the fourth and any other industrial revolution exclusively to the engineering profession is unjustified because the changes it introduces are multidimensional, but at the same time complex as well.

The lack of financial resources to approach the systematic consideration and introduction of technologies from the fourth industrial revolution is also evident.

The Government of the Republic of Serbia is committed to the introduction of technologies of the fourth industrial revolution and sees in it a chance to get closer to countries that already use this technology. However, the amount allocated for the introduction of advanced technologies in 2021 of 100 million euros is insufficient to achieve significant results in this regard. (Statement by the President of the Serbian government, 2019).

The Covid - 19 pandemic crisis has accelerated the application of digital technologies in the pharmaceutical and healthcare industries. This is a rare area in which, conditionally speaking, the Covid - 19 pandemic has brought benefits. It first shortened the time of research and introduction of new vaccines, considering that in about a year, a vaccine was produced and put on the market, ie put into use, which solves the problem of infection. Accustomed to many years of research and experimentation of pharmaceutical products, faster work on finding vaccines has caused confusion and doubts about the sufficient quality of approved vaccines, not realizing that the fourth and fifth industrial revolution abolished partial, phased and even team work that traditionally involves: conceptual design, its elaboration, transformation into the main project, through execution, to the use, maintenance and improvement of new solutions. In the fourth or fifth industrial revolution, idea creators, implementers, experimenters, users, patients, etc. go together or in parallel.

If smart robots and artificial intelligence used in various spheres of life and work are added to the above, it is clear that the lack of application of the technologies of the fourth industrial revolution puts the Republic of Serbia in a difficult situation, because highly developed countries have already entered the fifth industrial revolution with numerous advantages in increasing personal and organizational success, but also conformism and democracy. In such conditions, a person will be freed from hard and dangerous work, and he can direct his potentials to the creation of ideas and their implementation.

Withstanding all of the above, It should be borne in mind that in Serbia, the information industry is significantly more developed than other sectors, which is evident in the participation in exports of important components for advanced technology, ie artificial intelligence. It turns out that it is necessary to change the attitude towards this export branch, because a smart industry requires a smart policy and its implementation.

From the above, it can be stated that Serbia should approach reindustrialization and the introduction of new smart industries of the future through national policies and strategies. It is shown that “smart production and digitalization require smart

industry, education and innovation policy” or “complex transformation of the economy, society and culture” through “improvements in the field of artificial intelligence, robotics, new materials, nanotechnology.” (Mičić, 2020).

## 7. RESUME

The history of technological development has been accompanied by various technological tsunamis that have taken the form of a revolution, even where there is no revolution, or no revolution at all. Another indisputable fact is noticeable that the more a person becomes acquainted with technology, the more he becomes an integral part of it, and over time, the more people use it, the less they notice it and the less they appreciate it. When technology stops, or a person is left without it, then he feels its significance, which is analogous to health. When a person has health, he values it a little, and when he loses it, he becomes aware of its value.

The analysis showed that in the fourth, fifth and every subsequent industrial revolution there is no real dilemma of man versus machine. Man was, remains and will remain in the future the main factor and factor that will create life and work in the natural, but also in the social order. This is proven by historical, sociological-psychological studies and analyzes, but also research in the field of organization, economics and management. If artificial intelligence were to control man, it would create new slavery, that is, man would become a robot, and that is worse than being a slave.

Therefore, the place and role of man in the fourth industrial revolution will not decrease, and especially will not be eliminated, but on the contrary will increase, but in what man as the only conscious and rational living being can give, and these are invention and innovation due to which is a man who managed to reach the fourth, that is, the fifth industrial revolution. However, each new revolution brought certain changes and dislocations of resources, but at the same time it brought a better quality of life for man, that is, civilization. This law will also apply to future industrial revolutions, which will require a person to quickly learn from acquired knowledge and skills and at the same time learn from acquired and accept new habits. This will be the biggest challenge for man.

In the future, that is, in Industry 4.0, there will be new relationships between people, which will be replaced by individualism, instead of traditional collectivism and the tribal way of life and work. The advanced technologies and concepts produced by the fourth industrial revolution will not bring into question the socialization of man and society as a whole, but socializing, communication, cooperation and life in gen-

eral will take place in a different, ie digital way. The increased leisure fund, thanks to advanced technologies, will create more freedom in choosing the people with whom one will work, cooperate, communicate, etc. Man in the fourth industrial revolution should not fight for the conquest of nature, but should strive for the unification and establishment of partnership with nature, so that nature would not punish man.

In this context, it is necessary to establish a holistic systemic concept in the organization and management of certain sciences, which must be transformed in the direction of abolishing the partial observation of business factors in the fourth industrial revolution. Psychology, especially technical and economic psychology as branches of general psychology must be integrated. In that, a person must get a primary place, especially in the conditions of an increased fund of free time, in which a large part of the population will have psychological disorders and problems if he is not able to organize life in such free time. It is already being shown today that the biggest problem is when a person does not have a job or does not know how to use a working day. In this context, it will be necessary to build hospitals for mental illness, as a result of unorganized free time and alienation of a person in relation to another person, ie people.

The Republic of Serbia is far from the fourth industrial revolution, and in some elements it has been in the second industrial revolution for several years. According to the Global Innovation Growth Index, it lags especially behind the countries in the EU, where almost the same leaders have been positioned in the same leadership positions for several years. The Republic of Serbia lags far behind the surrounding countries, Croatia and even Montenegro. The European Union, as a continent, in terms of innovation and the introduction of new technologies is behind North America. Switzerland, Sweden and the Netherlands have held the leading position in Europe for many years. These countries have the highest score of innovation in Europe, and thus the highest representation of technologies of the fourth industrial revolution.

## 8. REFERENCES

- [1] A. Anđelković: Upravljanje inovacijama i kreacijama u dinamičnom okruženju sa posebni osvrtom na visoko obrazovni sistem u Srbiji, doktorska disertacija, Fakultet za poslovne studije i pravo, Beograd, 2018.
- [2] Rober Atkinson i Stephen Ezell: Ekonomika inovacija - Utrka za globalnu prednost, Mate, Zagreb, 2014.

- [3] Velimir Dedić i drugi: Platforms for digital leadership, monografija, Fakultety of Information Tehnology and Engineering Belgrade, 2019.
- [4] Fourth Industrial Revolution, World Economic Forum”, [www.weforum.org/focus/fourth-industrial-revolution](http://www.weforum.org/focus/fourth-industrial-revolution), pristup 10. aprila 2021.
- [5] Patrik Gauri and Jim Van Eerden: Detaljnije videti: What is Fifth industrial revolution is and why it matters, The European Sting and World economic forum, 16. maj 2019.
- [6] Michio Kaku: Fizika budućnost, Mate Zagreb, 2011.
- [7] Tony Joseph: How the 5th Industrial Revolution is Advancing Humanity at Workplace”, Fingent, 21.2.2020.
- [8] Milan Milošević: Globalni indeks inovativnosti 2019 - Uvek isti na rang listi, Vreme, 1. avgust 2019.
- [9] Vladimir Mičić: Četvrta industrijska revolucija - poruke za reindustrijalizaciju Republike Srbije, Srpska akademija nauka i umetnosti, 2020.
- [10] Izjava predsednika vlade R. Srbije na Međunarodnoj konferenciji rada u Ženevi, Fonet, 12. jun 2019.
- [11] Sanja Podder: Lifelong Learning key for Jobs of the Future, Likedin, 28. novembar 2019.
- [12] Sanjai Podder: The fourth Industrial Revolution - Rise of Man or Slave of Machines, Linkedin, 27. jula 2017.
- [13] Milan Radosavljević i Vojislav Vučenović: Holistička tehnologija uspešnosti, FORKUP, Novi Sad, 2014.
- [14] Igor Tomić: Četvrta industrijska revolucija: Šta to znači i kako da se postavimo, Samoobrazovanje, septembar 2018.
- [15] James Wilson and Paul Daugherty, “Human plus Machine”, HplusM, Amazon, 2019.