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In the Fourth Industrial Revolution era, Security, Safety, and Health

Michail Chalaris*

Department of Chemistry, School of Science, International Hellenic University, 65404 Kavala, Greece

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Abstract

This paper deals with the impacts of the 4th Industrial Revolution in the fields of safety, health, and security of populations. The central issue is how, after two World Wars, three Industrial Revolutions that have already proceeded, and successive technological developments that the world has experienced, the fourth Industrial Revolution will change people's daily lives. We proceed to overview the combination of automation technology with cyber technology, which manages an extremely large amount of data and highlights new forms of human-machine interaction. At the same time, the rise of the Internet of Things, artificial intelligence, and modern mobile communication, which contribute particularly beneficially to health and safety issues, are being studied. No doubt, the role played by governance models and the degree of trust between citizens and the state they achieve each time - which is mainly related to the decentralization of central authority and the level of transparency - could not be left out of context. Finally, possible risks arising from the use of new technology are touched on, as well as relevant ethical dilemmas that may arise, since the benefits from the fourth Industrial Revolution are very important, but still some threats remain due to incomplete specifications and legislation.

Keywords: 4th Industrial Revolution, Technology, Health and Safety, Security, Cybersecurity

1. Introduction

The last few years have seen crucial changes in many areas of human life, as the beginning of the fourth technological revolution is about changing our everyday life, working conditions, and how we communicate or interact.

The Fourth Industrial Revolution (4IR) has brought about many new technologies and innovations that have the potential to revolutionize various industries and improve our lives. However, these new technologies also come with potential risks and ethical dilemmas that need to be addressed. Jack Ma distinguishes between the great benefits that technological progress and industrial revolutions will lead to, such as opportunities for new successful careers, and the possible problems that may arise. We should bear in mind the two World Wars that came after the First and Second Industrial Revolutions. Furthermore, the OECD [1] mentions that the progress of scientific knowledge creates new opportunities and alternative answers, while simultaneously strengthening every kind of change. However, innovation in science and technology sets significant questions in relation to what is human [2]. Since these changes are rapid and probably cannot be controlled, we cannot be certain how to manage them in advance [3]. However, based on current scientific data, we could speculate on what our actions should be. It is understood that professional areas will have to redefine their profile, covering skills that will correspond to the new requirements. This challenge to acquire new skills is a demanding factor in terms of the policy to be adopted and the necessary reforms in education [2]. One of the biggest changes that the 4th industrial revolution has brought is the change in security, health, and safety [4]. Indicative instances of how the 4IR is influencing health and safety are shown below [4]. Firstly, the increasing use of robotics and automation in industries such as manufacturing, construction, and healthcare is reducing the need for human workers to perform dangerous or physically demanding tasks, thus improving workplace safety. However, there are also concerns about the safety of robotic systems and the need for appropriate training and regulation.

Secondly, the use of Artificial intelligence and big data analytics in healthcare is improving patient outcomes by enabling more accurate diagnoses and personalized treatment plans. However, there are concerns about data privacy and the potential for bias in algorithms.

Thirdly, wearable technology, such as smartwatches and fitness trackers, is helping individuals monitor their health and fitness levels. In the workplace, wearable technology can also be used to monitor workers' exposure to hazards and to prevent injuries.

Fourth, the use of virtual and augmented reality in training and simulation is improving safety by allowing workers to practice potentially dangerous tasks in a safe environment. In healthcare, VR and AR can also be used for medical training and simulation.

Finally, the increasing use of digital technologies in healthcare and other industries has led to greater cybersecurity risks, including the potential for cyber attacks on critical infrastructure and personal data breaches.

Additionally, we refer to examples of how the 4IR is affecting security [4-7]. The increasing use of digital technologies in all aspects of our lives has led to a corresponding increase in cyber attacks and security threats. This includes threats to critical infrastructure, personal data breaches, and cyber espionage. The 4IR has led to the development of new security technologies and approaches to address these threats, such as AI-powered threat detection and response systems and blockchain-based secure data storage. The use of biometric technologies, such as facial recognition and fingerprint scanning, is increasing in areas such as border

*E-mail address: mchalaris@chem.ihu.gr
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control and access control. While these technologies can improve security by providing more accurate identification, there are also concerns about privacy and potential misuse of biometric data. The increasing use of autonomous systems, such as drones and driverless vehicles, is raising new security concerns. For example, drones can be used for espionage or to conduct attacks, while driverless vehicles can be vulnerable to cyber-attacks. The increasing use of surveillance technologies, such as CCTV cameras and sensors, is improving security by providing more comprehensive monitoring of public spaces and critical infrastructure. However, there are also concerns about privacy and the potential for misuse of surveillance data. The use of technologies such as facial recognition and automated passport control systems is improving border security by enabling more accurate and efficient screening of travelers. However, there are also concerns around privacy and the potential for bias in these systems.

Overall, the 4IR has the potential to significantly improve health, safety, and security outcomes, but it also presents new challenges that must be addressed through appropriate training, regulation, investment in new technologies, and consideration of ethical and privacy concerns.

Moreover, these new challenges and technologies also come with potential risks and ethical dilemmas that need to be addressed as we mentioned.

A summary of these factors is set out below [4-7]. With the increasing use of digital technologies, there is a growing concern about the privacy and security of personal data. New technologies such as AI and big data analytics rely on vast amounts of data, and the way this data is collected, stored, and used raises ethical questions around privacy and consent. The increasing use of automation and robotics in industries such as manufacturing and logistics raises concerns about job displacement and the potential impact on workers and communities. The use of AI and machine learning can lead to biases and discrimination in decision-making, particularly when algorithms are trained on biased data or reflect societal biases. The development of autonomous systems such as drones and driverless vehicles raises concerns about the potential for accidents and the need for ethical decision-making in situations where autonomous systems are responsible for human lives. The increasing use of digital technologies has led to concerns about their environmental impact, including the carbon footprint.

Moreover, some concrete recommendations for addressing potential risks and ethical dilemmas that may arise from the Fourth Industrial Revolution (4IR) and the use of new technology are presented [4-7].

Organizations should prioritize data privacy and implement strict data governance policies, including data minimization, encryption, and access controls. Individuals should be informed about how their data is being used and given control over their own data through mechanisms such as opt-in consent. Governments and organizations should develop policies and programs to support workers impacted by automation and robotics, including retraining and education programs, social safety nets, and policies to encourage the creation of new jobs and industries. Organizations should prioritize diversity and inclusion in their hiring and training practices and develop mechanisms to detect and address bias in algorithms and decision-making systems. Transparency and accountability in algorithmic decision-making should also be prioritized. Standards and regulations should be developed to ensure the safety and ethical use of autonomous systems, including mechanisms for human oversight and accountability in decision-making. Ethical considerations, such as the value of human life, should be prioritized in the development of autonomous systems.

Organizations should prioritize sustainability and environmental impact assessments in the development and deployment of new technologies. The use of renewable energy sources and responsible disposal of electronic waste should also be prioritized.

To conclude, addressing the potential risks and ethical dilemmas of the 4IR requires a collaborative effort between governments, organizations, and individuals. It is essential to prioritize ethics, transparency, and accountability in the development and deployment of new technologies to ensure that they are used in a way that benefits society.

This paper aims to assess the 4th industrial revolution changes and impacts on health, security, and safety.

2. Analysis of 4th Industrial Revolution

The 4th Industrial Revolution as an idea and as a term was mentioned by Professor Klaus Schwab, famous German economist and initiator of the World Economic Forum, who in his book "The Fourth Industrial Revolution" predicts that the 4th Industrial Revolution (4.0) can differentiate into it deepens the meaning of our lives and work, as well as the way we relate [5].

At the same time, the dominance of the 4th Industrial Revolution is the main theme of the annual meeting of the World Economic Forum in Davos, Switzerland (January 20-23), while in October 2016 the World Economic Forum announced the launch of a Center specifically for the Fourth Industrial Revolution in San Francisco.

It is a term used by both public (e.g. governments) and private bodies (e.g. World Economic Forum) to describe changes in the production of goods and services due to the implementation of a new set of technological innovations [6].

In essence, this is a revolution that combines automation technology with cyber technology, dominated by increased data volume, connectivity, analysis, business intelligence, new forms of human-machine interaction, robotics, 3D printing, machine and systems integration, smart grids, artificial intelligence, wearable devices, augmented reality, virtual reality, haptics, simulation (simulation), autonomous vehicles, cyberphysical systems and additive manufacturing [7].

Let us look in more detail, however, at some of these concepts. Cyber-physical systems were first used by Gill in 2006 at a US National Research Foundation conference to describe those systems whose functions are coordinated, controlled, and completed by a computing and communication kernel. Most cyberphysical systems are semi-autonomous. That is, they can only operate independently under predetermined conditions, as is the case with semi-autonomous drones [8].

The prosthetic construction allows the construction of 3D objects through the addition of a material (e.g. plastic, metal, concrete) with layering (layer-upon-layer). Special modeling software and special equipment play a key role in prosthetic construction. 3D printing, rapid prototyping and instant digital manufacturing are some of the underlying prosthetics technologies.

The analysis and processing of big data analytics is related to the use of advanced analytical methods on data, which come from different sources and have different sizes, and which can be structured, semi-structured or even

unstructured. Their main characteristics are high intensity, which is greater than terabytes and petabytes, high speed and great diversity. High-speed data is Twitter messages or Facebook posts.

Additionally, the evolution of social networks and modern mobile communication combined with artificial intelligence and the rise of the Internet of Things has brought broad forms and sources of data to health and safety issues. Their analysis contributes to fast and accurate decision-making by researchers, analysts, and businesses. Businesses, by making use of new data sources such as text analytics, machine learning, predictive analytics, data mining, statistics, and natural language processing, can be driven to new insights with the help of advanced analytics.

Cloud computing is a popular term that has already revolutionized modern computing and describes the globally available computing resources located in powerful data centers. The above technologies require modern telecommunication networks with high speeds.

The previous generation networks (3rd and 4th) are gradually being replaced by 5G technology, which is expected to drastically transform the role that telecommunications technologies play in society. In addition, this technology is expected to have a huge impact on the economic development and global digitization of an interconnected society, where not only all people are connected to the network but also many other devices (things), thus creating a society where everything is connected through an Internet of Everything.

At this point we must mention that 5G technology will allow the emergence of new use cases, such as for example smart cities, smart farming, public security services and logistics services. In addition, these networks will in the future form the basis of mobile communications, which will be distinguished for their speed and reliability. The applications in this case refer to autonomous vehicles, to the intelligent networks of transmission and consumption of electricity, to telemedicine applications as well as to industrial automation.

In September 2019, Korea became the first country in the world where the users of 5G networks exceeded the barrier of one million; while the estimates are that in 2023 there will be over 800 million devices compatible with 5G.

The term "virtual reality" was first used in 1989 by Jaron Lanier [9], and is an interactive, three-dimensional, computer-generated environment into which one can immerse oneself. Technology, we could say, leads the user to be "absorbed" by a virtual world that has been created by a computer and has taken the place of real world.

Augmented reality is the technology where, through an interactive process, real information is combined with virtual information, in three dimensions and in real time, while each information created is presented in objects of the real world [10]. This is a very useful application for solving everyday problems. One can measure existing objects, see what different furniture looks like in one's home before buying them and browse complex places without even looking at the map. He can also discover new ways to complete his daily tasks.

On the subject we could note that the Internet of Everything can be used alternatively for the Internet of Things, since apart from classic computing and network devices, we have connected many everyday objects (called things). The Internet of Things is a network of objects, each one with built-in sensors, which are connected to the global Internet [11]. It can have applications in the field of health, environment, energy, transport, while types of devices are sensors, wearable devices, such as glasses, watches, home automation, body detectors / trackers.

2.1 Impact of the 4th Industrial Revolution

The general impression of the 4th Industrial Revolution is that it will have a basically positive effect on the axis of work, productivity and the economy. This also emerged in 2016 at World Economic Forum, on the possibilities it will bring to increase the level of income worldwide and improve living conditions around the world. Beyond the improvement of people's lives, the benefit that will occur refers to the reduction of transportation and communication costs, as well as to that of trade, the efficiency of supply chains and the opening of new markets [6].

Robotics, artificial intelligence, nanotechnology, the internet, biotechnology, autonomous vehicles, 3D printing and energy storage offer excellent possibilities for development [2]. One example is the ability to connect most of the population via mobile telephony, which will be characterized by unprecedented storage capacity, processing power and instant access to knowledge.

The business sector is now obliged to adapt the way they design and distribute their products and services to new consumer trends and consumption patterns. Their organizational structures, as well as their forms of cooperation, are changing decisively, with the consumer's expectation as the main driving force.

The latest governance model - as it emerges from the texts of international bodies - imposes the decentralization of central authority, with the aim of establishing transparency and a relationship of trust between citizens and the state. In this way, on the one hand, citizens will have the opportunity to supervise the government, and on the other hand, progress will be made in their cooperation with public authorities.

But the governments themselves will gain more and more tools to increase population control. Regarding the impact on people, it is believed that the 4th Revolution will drastically affect areas such as privacy, property, place and way of working, leisure, relationships and interactions, consumption patterns, values, beliefs, ethics [12].

However, the development of technology can have social consequences unforeseen in unemployment (Farrell and Greig), mainly in terms of the prerequisites it places on work, new skills, and occupational specializations. Technology, after all according to Caribaldo, is not independent but is involved in the social and political structure, sometimes favoring and sometimes excluding some social choices (2016, cited in [6]).

In addition, there are fears that this revolution could lead to greater inequality, as it will disrupt the labor market. Apple CEO Tim Cook at the Bloomberg Global Business Forum (2017) commented that his goal - if he was the leader of the country - would be to exclusively make good use of talented people [13]. This search for talent, however, will create a new labor market that will further divide workers. This means that low-skilled, low-paid workers will be replaced by computers, while highly skilled workers will be hard to replace. These occupational discriminations are likely to exacerbate social inequalities and increase tensions [14].

Other important issues are cyber security, the spread of fake news, piracy, breach of privacy and privacy, cyberbullying, hate speech and moral disturbances. Companies in order to face such risks related to the security of their networks, should depict them accurately, paying attention to the level of accessibility of their systems. Caution is needed both in the case of an internal threat from a human

factor, as well as from an external threat (eg hackers, terrorists).

Finally, moral values, religions and ideological boundaries differ from person to person, from country to country. Therefore, there is great uncertainty about the prevailing ethical framework in artificial systems [13]. Consequently, there is a fear that technology will greatly homogenize people's views and polarize societies.

Addressing the above challenges will require significant political efforts and systematic reforms. Iv 2018 David [13] in an interview typically states that the 4th Industrial Revolution is a different stage of human development. If, however, we all talk and work together from its earliest stages, then we may be able to avoid the mistakes observed in previous technological revolutions; mistakes that resulted in mass exclusions, human rights violations and environmental disaster.

2.2 Security, Health, and Safety during the 4th Industrial Revolution

As explained above, the 4th industrial revolution has brought up many changes as well as innovations in the field of technology, which affect health, security, as well as safety of today's worlds. During the last decade, the Internet of Things has entered people's lives to such an extent that it is difficult to distinguish it. Smart phones, homes, cars, and even public infrastructure (roads, escalators, etc.) operate with countless sensors and process such a range of data that it is impossible for users to perceive. However, in this way the transmission of information, the maintenance of the respective infrastructure and the safety of their users are achieved [15-17].

Did David Cameron, former Prime Minister of the United Kingdom, realized the future that IoT opens up and the multi-layered benefit it will bring; he saw the beginning of a new industrial revolution, one that would improve transportation, address climate change, and help reduce energy consumption. According to the Cisco Internet Business Solutions Group (IBSG), to determine the era when the IoT was "born", it states that 20 years ago there were 500,000,000 devices connected to the internet, which corresponded to only 0.08 of the human population. In less than 10 years the conditions were reversed, with the rise of smart phones and tablets, catapulting the number of connected devices to 12,500,000,000 when the Earth's population reached 6,800,000,000, a figure unprecedented in history [15-17].

This increase is of course a very important event, as this jump has a direct impact on improving people's daily lives. Already, many patients are resorting to having such devices implanted in their bodies in order to allow their treating physicians to draw important conclusions about how certain diseases are caused. Also, the possibility of placing very small sensors connected to the internet in plants and animals, giving important information to farmers and growers about the temperature and humidity of the soil, but also to the breeders for the daily production of their livestock unit. And all of this is happening thanks to the IoT and the applications it provides [16].

The benefits of IoT technologies in the field of healthcare are many and have to do with both the monitoring of patients, medical staff and "smart" objects carried by patients, as well as the automatic collection of health data. The widespread use of IoT in the field of health improves the care of patients, both inpatient and resident, reduces the costs of health care, more efficient management of drug stocks in each organization, while the diagnosis and therefore treatment of diseases are assisted.

Areas of application of IoT technologies in the field of health include telemedicine solutions, monitoring and compliance of patients with appropriate medication, as well as warning about patient well-being [15-17].

The following are some of the applications of smart healthcare [17]:

- Patients Surveillance: Monitor the condition of patients in real time inside health organizations (eg public hospitals, private clinics) or at home.
- Physical Activity Monitoring for Aging People: A body sensors network records, twenty-four hours a day, the movements of its users, their vital signs while at the same time a mobile unit (p eg a smart phone or laptop) collects, visualizes and records all this activity data.
- Medical Fridges: Sensors inside these "smart" refrigerators control and regulate the cooling conditions in the places where medicines, vaccines and various organic elements are stored.
- Chronic Disease Management: Monitoring systems for patients with chronic diseases, such as diabetes, heart, or lung disease, enable the remote monitoring of the course of these diseases. It is understood that the benefits are many as admissions to treatment centers are minimized or if admission is made the length of stay is reduced, resulting in economic benefits to be huge.

It is also important to note, for the purposes of this paper, the revolution's effect on the environment's safety, as the environment plays a crucial role in people's lives, health, and safety. A healthy environment without pollution makes living better and healthier. However, creating a healthy environment is not easy, as industry or transportation; various human and often reckless activities generate waste and pollutants, resulting in the deterioration of air, water, and soil quality. The consequences of all these activities have a negative impact on human health as they have the ability to increase stress levels, destroy the immune system and increase toxicity in the blood [17].

In order to properly monitor the environment and properly manage it, smart methods and newer technological advances will be needed. These solutions can come from the "smart environment", which as an important technology provides a large number of environmental applications. In fact, if the various devices in the smart environment integrate IoT technology, it will be possible to detect and monitor various environmental objects, which provide potential benefits for the creation of a "green" world and a sustainable life [15 -17].

The following are some of the applications of the smart environment [17]:

- Air Pollution Monitoring: Through IoT technology and remote-control sensors, air quality can be managed. Systematic control of carbon dioxide (CO_2) emissions into the atmosphere, emitted by factories, cars, farms, etc., can prevent high human exposure to gases toxic to health.
- Fire Detection: The ability to detect IoT devices supports environmental safety as soon as a group of sensors detects smoke or fire; it immediately informs the nearest fire department. In this way, huge environmental disasters and human casualties can be avoided.
- Water Quality: IoT can be used to measure water pollution levels effectively and in real time.

It is important to consider the utilization of IoT in medical issues (IoT), such as health, safety and security during the 4th industrial revolution. According to Dr. Yogesh Shelke and Arpit Sharma, the term "Internet of Medical Things" (IoMT) means "an IoT-based healthcare application that includes a network of connected devices that detect vital data in real time" [15].

In particular for real-time remote treatment of chronic diseases, such as in the case of diabetes, asthma or high blood pressure, IoMT supports machine-to-machine (M2M) interaction and offers appropriate solutions. These developments are shaping the health sector favorably, making it accessible to everyone and everywhere, with more reliable data and significantly lower costs.

In addition, IoMT enhances Human-to-Machine interaction, enhances real-time health monitoring solutions, and allows patients to participate in health-related decision-making. taking care of them. This is made possible by the various applications that support real-time monitoring of their health, the recording of health data resulting from this monitoring and the subsequent maintenance of these important logs [18].

In this way, the patient, having direct access to his personal health data, can actively contribute to the decision-making regarding his personal care requirements. At the same time, it is possible for specialized medical staff to analyze the generated health data, thus providing specialized and personalized health care solutions (personalized healthcare solutions) to each patient.

Here are some of IOMT's main health benefits [17]:

- Reduction of service costs: With the increase of real-time patient monitoring and the administration of medicines with the use of "smart" devices, the unnecessary visits to doctors and medical centers are reduced. In this way, the costs for healthcare providers are greatly reduced.
- Effective patient management: With the widespread connectivity of devices, healthcare providers now have access to important information about their patients' health status, in real time. This enables them to make informed decisions about the treatment to be followed, while also helping them to identify the various diseases at an early stage and treat them appropriately.
- Enhance patient care: With greater accuracy in diagnosis, timely action by physicians, preventive treatments and improved therapeutic results that can be achieved through the use of IoT, enhance patient health care and thus improve confidence patients towards online care services.
- Remote medical assistance: One of the most important health benefits of IoT is remote medical assistance. The "smart" medical devices have the ability to monitor the patient's condition and control the way he receives his medication, without the need for his physical presence in a medical center or the help of specialized medical staff to control of the patient.
- Drug management: Proper drug management is a multi-million-euro business and one of the biggest costs for healthcare providers. IoT devices can ensure compliance with all safety standards in the pharmaceutical market, from the production of drugs to their storage in hospitals or pharmacies.
- Higher patient involvement: IoT modifies patient access to individual health data and thus enables them to have a meaningful role in their personal health journey. Patients using various apps and software are able to track their progress on a daily basis.
- Error Reduction: Automated workflows collect and transmit data, resulting in lower error rates compared to a non-automated collection system.

In addition, it is important to note of some of IOMT's most important health challenges:

- Health data security: The main concern of regulators and IoT users is the security of sensitive personal health data stored and transmitted by connected devices. Although many organizations and institutions ensure that this sensitive data is stored securely and encrypted, this is often not possible. Institutions do not always have control over the security of the devices used as data access points or the security of the data during their silk transmission of medical devices. Basically, this is a risk that increases depending on how many devices are connected to the internet.
- Combining a large number of protocols and devices: The healthcare sector is not favored either by the use of multiple devices or by the lack of common protocols and uniform ways of communication on the part of medical device manufacturers. Even when the interconnection of the devices is ensured, the absence of a common method of communication precludes the collection and recording of data, as a result of which an important amount of knowledge escapes due to the impossibility of processing this data.
- Extremely wide range of data:

The data generated and recorded by medical IoT devices is particularly large in volume and its study could benefit a large portion of patients. However, without an advanced analysis software gathering and using this much information would be very complex. Healthcare professionals are uncertain about how this data would influence decisions made about patient health and of course how the patient's course would be affected.

- Medical staff's education and training of: Hospitals and various healthcare providers should educate and properly inform their medical staff about the use of the various IoT devices as well as about the various risks involved in the security of sensitive medical data collected and managed by IoT devices. It is understood that in order to achieve the proper information and training of medical staff on the management of IoT devices, large sums of money are required, for seminars and workshops, on the part of the organizations [17].

Moreover, the 4th industrial revolution has greatly impacted the occupational health, safety, and security around the world. The new technologies that come to frame the 4th Industrial Revolution, in addition to the transformation of production can completely change the conditions of safety and health at work. The IoT with its data processing capabilities, intelligent safety technologies, as well as virtual engineering (simulations), can facilitate the analysis and management of risk related to the health and safety of workers and immediately improves their conditions. For example, accident prevention could be based on sensor networks installed in the "smart" industrial environment, e.g. for gas detection or biomarker measurement. Also extremely important can be the use of machines with the ability to self-monitor, monitor the environment and send information to

diagnostic centers. This intervention could lead to accident prevention based on real-time risk forecasts. In addition, the use of robots instead of humans in tasks that are not only dangerous and aggravating for the musculoskeletal system (his injuries account for about 23% of absences due to illness in countries such as Germany) but also monotonous will be further expanded due to continuous improvement of robotics and its introduction into additional sectors. Also, even in applications that still require human participation, cooperative robots (co-bots) such as exoskeletons will be able to reduce physical exertion. They will also be able to support and guide the learning of new tasks but also be aware of their environment (through sensors and control methods). Based on these capabilities, workplaces injuries can be avoided but also reduce employee stress about the process of learning a new job or controlling its proper execution [18].

Finally, another example where the new technologies related to the 4th Industrial Revolution could contribute to the increase of workers' safety is that of monitoring workplaces through a circuit video recording and the application of image analysis methods on the data stream in order to detect in real time dangerous situations such as for example, people's access to restricted areas.

Despite the possible benefits, some important concerns are raised while important issues remain open. Based on what has been described above, production systems are expected to become more and more complex, which will lead to a more complex combination of the job content, organizational issues, and production management (management). In this context, there are risks mainly for the mental health of employees, an area that is critical and demanding when creating relevant legislation and rules. In addition, new technologies in the productive process can widen the generation gap as younger populations are typically better trained in information and telecommunications technologies, while further reductions in manual labor and higher intellectual health pose a risk of job loss for categories of workers (and not only) as long as they are not further trained. The term generation gap has been used extensively over time, but here it acquires a more disturbing meaning. The speed of developments, the complexity and the special training required will make the gap even more acute and make it even more difficult to integrate workers into the new conditions. It is characteristic that while among the first three great industrial revolutions we had periods of the order of a century; the 4th Industrial Revolution seems to take shape in just 50 years from the previous one, while the 5th could come even sooner. Developments are so rapid that even experts are sometimes unable to follow them. In addition, it is easy to understand that it is completely different to train an employee in a new mechanical system or a new process in relation to introducing him to complex technologies that completely change the way of operation and thinking. In conclusion, the risk of a new illiteracy is much more dangerous and difficult to deal with than in the past [18].

Another important feature brought by modern technologies is the better and daily monitoring of workers' health using smart applications and devices (eg devices that monitor basic bio-indicators or habits related to exercise and sleep). However, their use raises privacy issues and can be potentially stressful. Thus, for the implementation of such solutions in the framework of the new GDPR are the initials of General Data Protection Regulation requires full control of the data to the employee, in turn however this requires relevant training of the employees. Recent technologies such as Blockchain (technology that ensures privacy, validity, and non-invasion of data transactions) can ensure controlled access to this information.

However, the potential risks to which employees may be exposed due to the use of new technologies can also be considered important. The application of Artificial Intelligence also involves risks due to the potentially unpredictable behavior that systems based on it may have, if called upon, to decide on unexpected / unpredictable events [17].

Also, the immediate application of innovative technologies can lead to mechanical, electrical, thermal, chemical, and other hazards, as their rapid growth often does not allow the maturation of instructions, regulatory frameworks and standards related to the Health and Safety of workers. An additional thing to note is that multiple devices connected to the internet increase the risk of attacks and thus the risk to cyber security. Even more critical, however, is the risk to the health and safety of workers due to the possibility of malicious control or deactivation of systems [18].

3. Conclusions

The fact that a large number of the world's population will be able to use social media for the purpose of sharing information and knowledge is evidence of how the fourth industrial revolution is involved at various levels in the safety, security of society, but also in health of the people. In addition, there is the possibility of accessing digital health services and platforms, thus improving the quality and security of services and transactions.

These changes are often associated with benefits such as improved human life, increased efficiency, and effectiveness. It should, of course, be mentioned that the quality of life for most people has improved anyway due to the successive stages of the previous three industrial revolutions: the mechanization of production (first), mass production (second) and the automation of production (third).

However, the fourth industrial revolution also raises many questions about some of the consequences it could cause not only in cyber security - as mentioned above - but also on an income and ethical level.

We could initially support the view that the 4th Industrial Revolution will bring about many positive outcomes in both safety and health matters. However, there are also significant threats to them, which are mainly present due to the lack of standards and current legislation. In other words, there is a risk that the prior care for the Health of the Employees will be questioned due to the lack of information and awareness among the political leadership, the shareholders, and the management of the involved companies but also the employees. In this context, further research is needed on how to integrate the care of workers' health in the 4th Industrial Revolution and the cooperation of multiple specialties such as engineers, computer systems specialists, psychologists, and ergonomics specialists. Workers' health issues from the design phase of innovative applications to be implemented during the 4th Industrial Revolution should also be included in the various risk analyzes.

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