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Artificial intelligence as a challenge

Abstract: This paper addresses the technology of artificial intelligence as a modern challenge. The main purpose of this article is to motivate all interested parties, the government leaders, scientific and expert public, lawyers, innovators, as well as end users to consider the challenges deriving from the application of this technology. Interpreting the technology of artificial intelligence from the perspective of different disciplines and practices contributes to its better understanding, while emphasizing a broad range of risks is a step forward in identifying and understanding the problems which we must readily encounter. If possible, some of the problems should be avoided and prevented in a timely manner. The main goal of the paper is to point to the challenges deriving from the application of this modern technology and raise awareness of the importance of organizing production and application of artificial intelligence technology. The paper starts from the hypothesis that knowing and resolving the broadest possible range of challenges is a prerequisite for regulating this modern technology for the common good. The article provides the analysis of content and a detailed review of literature dealing with artificial intelligence from the perspective of different scientific disciplines. The importance of the study is seen in its being a useful stimulus for initiating a debate about this topic. The social contribution of this study is huge because it puts forward the question of the challenges of artificial intelligence and leads to the strengthening of the awareness of the need for identifying and considering all potential challenges for the sake of their resolution. It is in the interest of whole humanity to focus on regulating artificial intelligence, with the primary focus on the achievement of general social welfare, and not on mere acquisition of profits or some other interest advantages. Only in this way can we protect ourselves from potential harmful consequences of this modern technology.

Keywords: artificial intelligence, challenges

Introduction

The question of challenges deriving from the production and application of artificial intelligence is one of today's most important problems. Combining physical space with cyberspace creates new virtual space for mutual cooperation of people with the aid of artificial intelligence systems, but also

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for forming a specific relationship between people and AI systems. Such complex environment, made by man and modern technologies, creates new forms of connection and appears as a source of new complex risks and "cyber threats" (Luknar & Jovanović, 2024). Artificial intelligence technology has found us relatively unprepared having in mind that it has already been applied to a certain extent in different branches of industry throughout the world, while there is no aligned legislative framework regulating this technology. Technological development easily stays away from legislative regulation due to insufficient flexibility of the legal system and the faults arising because of the need for harmonizing and fitting certain regulations with the entire legislative system of a country. Moreover, procedures take time to be established in practice. Due to the absence of adequate legal regulations, ethical guidelines have been proposed which refer to the production and application of this modern technology (Luknar & Jovanović, 2023).

Developed technologies change human life in a revolutionary rapid manner, becoming part of our everyday life and affecting the way in which we perform everyday activities, and that is why there is a discrepancy between technological development and its legal regulation. This situation requires urgent action and imposes the need for regulating the further course of the development and application of artificial intelligence which can cover the broadest range of risks. The ruling structures, scientific and academic workers, lawyers, experts, innovators and all other interested parties need to provide an overview of this problem because only in this way is it possible to reach a receptive and efficient comprehensive framework for regulating artificial intelligence. First it is necessary to strive for a general model of regulation which primarily refers to the production and application of artificial intelligence and is in line with main social goals, whose usefulness and efficiency are not achieved at the expense of human rights, freedoms and security. Furthermore, this model needs to be aligned with specific requirements because artificial intelligence technology is applied in different forms for performing specialized tasks in different branches of industry. In this manner, with the deductive method, it is possible to further regulate the specialized production and application of artificial intelligence and to provide protection from its abuse in the given specific environment. The first step in adequate regulation of artificial intelligence is as detailed as possible identification of challenges and facing them in the most efficient manner. Having in mind the complexity of this technology and the various applications of artificial intelligence systems, a multidisciplinary approach is necessary in providing an answer to the researched question.

Artificial intelligence technology

The first step in regulating a certain social phenomenon is its understanding, or defining. Artificial intelligence technology is a complex system of different technological tools with a certain specialized application for which the system has been designed. The most developed artificial intelligence systems try to behave like a live organism, i.e., to emulate cognitive functions possessed by man. Namely, this technology offers a broad range of functions and possible applications, which may cause confusion

in its theoretical determination. Concurrently with the development of artificial intelligence, its different definitions were created. In order to understand this technology fully, it is necessary to take into account its basic characteristics, i.e., its technological performances. Hence it can be defined from the perspective of computer sciences or other disciplines, depending on the primary focus, i.e., on whether we interpret it mainly from the perspective of the degree of its developed intellectuality or the field of practical application, such as support to the functioning of crucial state infrastructure, the work of public administration, for communication, in the field of culture, entertainment etc. In addition, we must not neglect the fact that this technology is developing and becoming more complex with incredible speed, which brings further ambiguities.

It is frequently wrongly made equal to machine learning, which constitutes only one of its segments. Artificial intelligence includes different types of technological systems which function within previously set logic and regularity; systems working by the model of perception among people and select data from the base, handle a large amount of data, discover regularities and make conclusions or certain kinds of predictions based on identified regularities. All the above-listed is included in artificial intelligence technology. This technology was primarily made with the aim of substituting man in all those activities which can be performed by a machine more precisely, more accurately, faster, more efficiently and less expensively, for example, different mathematical

and statistical operations used in electronic banking or trade, data collection and weather forecast, complication and simplification of data about soil composition for the needs of smart farming, faster and more simple identification of anomalies and changes on human skin, and many other activities.

In modern literature, different types of artificial intelligence (AI) are mentioned, which can to a certain degree help in understanding the scale of the potentials of this technology. The lowest level of artificial intelligence which has developed ever since its emergence is *Artificial Narrow Intelligence*, also known as "weak artificial intelligence", designed to perform the simplest tasks. The next type is *Artificial General Intelligence*, also known as "hypothetical AI", and it can perform any intellectual task like man, for example, learning, understanding and application of certain knowledge. This level of artificial intelligence is still being developed and perhaps it will not be possible to achieve its equal development in all domains. Hypothetical AI is the level of development given as an antipode to "weak AI". The next type of AI is *General Purpose AI*,[2] which is mentioned in the legally binding Artificial Intelligence Act of the European Union (EU Artificial Intelligence Act, 2024). General Purpose AI refers to machines which are generally able to perform a broad range of intellectual tasks by emulating man's cognitive abilities. Unlike specialized AI, which is designed to perform specific tasks, this level of intelligence tries to emulate human intelligence, i.e., it is simi-

[2]   In speaking practice, namely in the Serbian language, there is no established translation of this term. For the purpose of this research, the author uses the translation which most closely reflects the analyzed concept. For this reason, the original names have been supplied in brackets in the Serbian version of the paper.

lar to human intelligence in performing activities (Pinto, 2024). This type of intelligence includes *Open AI GPT, Dolly AI, Claude AI by Anthropic, Meta's Liama* and other similar AI systems. Artificial intelligence systems which were presented at the beginning of the 2020s are a step ahead of "weak AI", but they have still not reached the level of "strong AI", so that they are between these two levels of the development of artificial intelligence (Figure 1). The last development level of artificial intelligence *Artificial Super Intelligence*, which not only emulates and replicates general

(hypothetical) AI, but is also placed in the category of science fiction (Jones, 2024). Bostrom has written in further detail about this type of AI, the so-called "super intelligence" (Bostrom, 2014).

Mass digitization has helped the expansion of this technology in everyday life through smart devices, virtual assistants, software that enables service personalization, personalized search, photograph analysis, face and speech recognition, and many other functions. Machine intelligence comes as a result of complex processes such as data collection, handling available information and data bases ac-

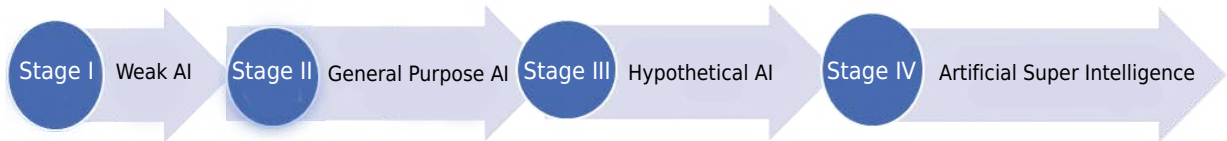| Stage I | Weak AI | Stage II | General Purpose AI | Stage III | Hypothetical AI | Stage IV | Artificial Super Intelligence |

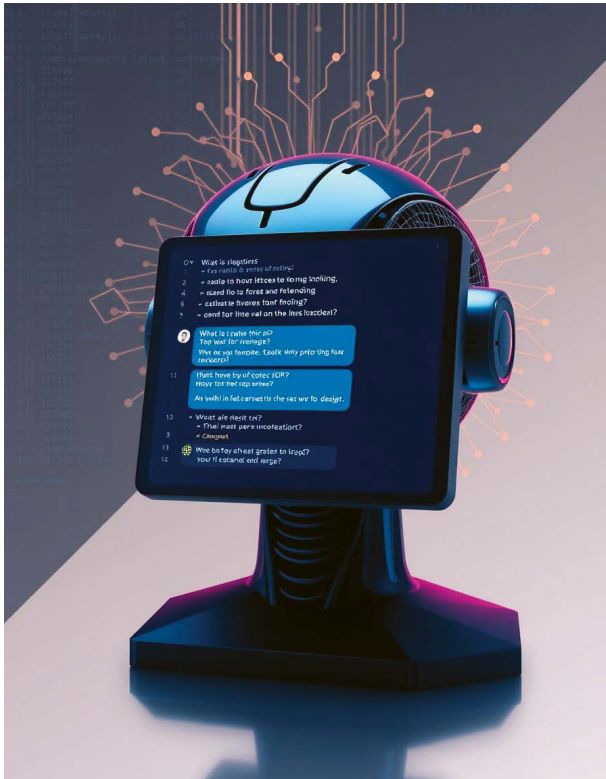Figure 1. Development stages of artificial intelligence

cording to the previously programmed goals/logic which serve for resolving certain tasks. That this is a complex technology is also supported by the fact that the data collection process may proceed in several different ways, either via sensors, by direct entering of instructions, or from the communication with other machines. The authors point to the characteristics which a device must have in order to be considered smart:

"• possibility of processing natural language for performing successful communication in English;

• presenting knowledge based on stored information;

• automated reasoning and using kept informa-

tion when answering posed questions and making new conclusions;

• ability of machine learning to adjust to new circumstances and reveal and extrapolate patterns" (Russel & Norvig, 2009, p. 2).

This modern technology has the potential to substantially supplement and facilitate the performance of different human activities. However, the problem is that the existing designed systems might be insufficiently flexible in the recognition of ethical issues and problems, while at the same time unsafe because of the absence of adequate legal regulations referring to the design and application of artificial intelligence technology.

ChatGPT
The photo was generated by AI images of the generator
on Freepik Picasso platform.

Challenges deriving from the development and application of artificial intelligence

Technology constitutes an important lever of power in today's society. Artificial intelligence is understood as a technological imperative in the most developed countries of the world. At the international level, there is an ongoing raced in technological development and innovation which give a competitive advantage, but at the same time confirm the posi-

tion of a country in the system of power. Artificial intelligence takes up a central position in the arena of balance of international powers and conflict of interests. The countries worldwide (the USA, Russia, United Arab Emirates, India, China, Serbia and many others) have included the development of artificial intelligence technology in their development strategic plans as one of the primary goals. State industrial and trade policies have a direct impact on the development, production and application of the basic equipment which is necessary for the production and application of artificial intelligence. international competition regarding artificial intelligence is manifested in practice mostly through competition in the supply chain of the products which ensure greater computing strength and through (non)availability of tools and performances which provide necessary support in the functioning of this technology.

Apart from achieving competitiveness at the international level, we must not overlook the market structure and competition among companies at the national level, which encourages technological development, primarily in a competitive, profit-oriented spirit. This situation may push to the background the essence of the technology, which should serve a general interest and not mere acquisition of profits or achieving other benefits deriving from technological development. There is a risk, due to the rivalry, of the worst scenario, i.e., that artificial intelligence might continue developing autonomously, without human surveillance. People have already invented the technology (simulation learning, independent play and meta-learning) which could turn the development of artificial intelligence into an undesirable direction, thus making it substantially harder for people to monitor the development and control AI. Although the primary purpose of the self-

learning method is to increase the efficiency of machine learning, there is a danger of gradual reduction of the importance of human participation in the creation and work of smart machines. Seen in the long run, due to the regular application of AI systems, trust in the work of this technology is being built. There is a risk of beginning to take AI "for granted", i.e., that the correctness of its outputs will not be considered at all with the passage of time, but that it will be unquestioningly accepted as truthful, while the correctness of its content will not be disputed whatsoever. We can say that this modern technology is like a double-edged sword.

The technology is not constant and/or unchangeable, and that is exactly why an active approach is required to its interpretation and regulation. We must be aware of all the challenges deriving from the production and application of this modern technology because only in this way will we learn where to direct attention during its regulation. The key challenges being related to artificial intelligence technology are:

1. production and design – the key challenge is how to make its usefulness larger than its harmfulness;
2. regulations – the key challenge is how to find best solutions, through law, policy, procedures and regulations, to the regulation of the fields of the production, design, application and development of artificial intelligence technology;
3. safety and correctness of the content of data and bases over which AI systems operate;
4. the matter of ownership over systems and data bases, determining responsibilities and sanctions for certain violations and abuses;
5. observance and implementation of general ethical guidelines in design and manner of functioning of AI systems, as well as human rights and freedoms, and anti-discrimination principles.

Thinkers throughout the world warn about the broad range of risks being related to artificial intelligence technology. No technology invented by man has ever caused such concern for the existential survival of humanity such as artificial intelligence has. Even the best-known computer engineers have expressed their concern. Geoffrey Hinton, who worked on the development of modern technologies and artificial intelligence, resigned from Google Company because he found it necessary to point to the danger and risks of this technology for society. Hinton states that machines will soon be able to think better than us and decide to take the helm over our society, which should particularly concern us, and that is why we need to devise how to prevent that from happening (Allyn, 2023). Elon Musk also points to the harmful effects of this modern technology and considers artificial intelligence "the most destructive force in history" (Times Now, 2023). Opinions about this technology vary drastically, causing both fear and ultimate rejection, pointing to its harmful consequences, as well as to its full acceptance. World leaders share opinions about artificial intelligence as an unavoidable technology of the future. However, serious challenges derive from the automation of weapons and the application of this technology in different military operations (Kissinger, Schmidt & Huttenlocher, 2023).

The prerequisites for the development of a country in modern era are its flexibility and willingness to accept innovation. Apart from indisputable advantages deriving from the application of artificial intelligence technology, numerous questions arise as well. Artificial intelligence technology in its work

uses information available to it. That is why the questions referring to data are the first to arise, such as issues of data privacy and protection, data quality and completeness, data availability and security, fairness, transparency etc. (Donald et al., 2023).

Artificial intelligence technology may reproduce the existing socio-economic inequality, affect capital flows, but also contribute to the deepening of the gap between the rich and the poor. The poor remain in the enchanted circle of poverty because of insufficient technological development and not possessing necessary technological tools and expertise in the field of computer sciences, and that is why they are forced to perform poorly paid jobs. Moreover, artificial intelligence can be a cause of numerous changes in the labour market and affect market volatility in a negative manner. Automation and robotization can lead to the disappearance of certain professions. AI has the potential to affect significantly supply and demand of certain types of professions (Goos, Manning & Salomons, 2014). In addition, other observed risks include the violation of privacy and algorithmic partiality due to inaccurate and insensitive data regarding different forms of discrimination. The application of artificial intelligence technology in education may serve as significant support in learning, but only if this technology is applied "fairly and effectively" (Mandić, Miščević & Bujišić, 2024) in education. Furthermore, there is concern about the development of this technology's performances and its increasing use might minimize the human aspect and push to the background the human element in creating modern technologies. As one of the challenges, the question arises about how to stop the development of uncontrollable and self-conscious artificial intel-

ligence. Moreover, another challenge is excessive reliance on artificial intelligence systems, which may lead to inertia and excessive dependence of people on AI services even in the performance of the simplest tasks, while easy availability of digital assistants may lead to the uncritical reliance on the work of AI tools. It is well known that intelligence in humans develops through their everyday encounters with certain problems/tasks, or decision-making. Blind trust in the validity of AI functioning, seen in the long run, may lead to the inability of new generations to solve the simplest tasks on their own because they are used to relying on AI tools. Apart from the above-listed challenges, there are also problems of consumption and demand of certain materials used in the production of AI tools. The challenge to be resolved is also what to do with the technological waste of non-biological nature which, together with the already-known climate change and problems, does not guarantee a bright future, unless artificial intelligence tools have been applied for finding the most efficient ecological solution.

The risks deriving from artificial intelligence technology can be summed up into certain risk groups. The first group is made of risks deriving from the lack of transparency and clarity. Artificial intelligence systems can be difficult to understand even to those who use this technology, while data over which AI performs operations are unclear and insufficiently transparent. The second group of risks includes economic risks and those referring to the marked due to the process of automation and robotization. The third group consists of social risks, which refer to the manipulation, threatening people's privacy and safety (*deepfakes*), political manipulation, cultural pressures, weaking of the human element etc.

Conclusion

Artificial intelligence is considered a vital strategic technology. In modern social-political conditions, this technology takes up the central place in the international balance of power and conflict of interests. However, the current regulation of modern technologies is already lagging behind worldwide. The first law which specifically refers to the technology of artificial intelligence was adopted by the European Union at the end of 2023. This law was preceded by numerous directives and ethical guidelines which were not legally binding. First the international community needs to harmonize the general legal framework for the primary regulation of production, application and distribution of this modern technology, which should comprehensively cover a broad range of challenges and problems presented in this paper.

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