The Impact of Optical Character Recognition Artificial Intelligence on the Labour Market

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Because of present day information technology, there is neither need to plant complicated computers for more millions price if we would like to process and store big amounts of data, nor modelling them. The microprocessors and CPUs produced nowadays by that kind of technology and calculating capacity could not have been imagined 10 years before. We can store, process and display more and more data. In addition to this level of data processing capacity, programs and applications using machine learning are also gaining ground. During machine learning, biologically inspired simulations are performed by using artificial neural networks to able to solve any kind of problems that can be solved by computers. The development of information technology is causing rapid and radical changes in technology, which require not only the digital adaptation of users, but also the adaptation of certain employment policy and labour market solutions. Artificial intelligence can fundamentally question individual labour law relations: in addition to reducing the living workforce, it forces new employee competencies. This is also indicated by the Supiot report published in 1998, the basic assumption of which was that the social and economic regulatory model on which labour law is based is in crisis[1]. Our aim is to examine how the application possibilities of artificial intelligence (including OCR) can be exploited and how the labour and employment policy implications of their application can be determined.

Keywords: artificial intelligence, OCR technology, labour law, employment policy, innovation

Introduction

The creation of artificial intelligence has occupied humanity for a long time and has appeared in many films wherein the machines have been capable for human communication, interaction and thinking. The idea of artificial intelligence fills humanity with both excitement and fear. We are living in a world where the concept of artificial intelligence has become common and its rudimentary applications have been started in several areas, think of self-driving vehicles, recommending engines (YouTube), or surgical robots. During the past few years, the hardware devices have entered the market with the capacities and speeds which are able to perform complex mathematical calculations relatively quickly. However, before we go any further, it is worth asking the question: what is intelligence and what is artificial intelligence? Intelligence may simply not be articulated, but the book called "Új magyar lexikon" stated that intelligence is "*a measure of the degree of intellectual functioning. Primarily, it shows the individual's ability to adapt to new circumstances, which is closely related to the application of previously gained experience, broad consideration of the moments of the situation and the ability to think*"[2] (Rényi Péter, 1962). In short, intelligence is nothing more than identifying a problem based on past experience and

solving it. Of course, intelligence cannot be so narrowed down, but the more we try to formulate it more precisely, the more it becomes a philosophical question than a "hand-caught concept" that can be transposed into informatics. Now, as we have circled the concept of intelligence, we can use this to formulate what artificial intelligence is. In short, artificial intelligence is nothing more than a machine-based representation of intelligence. This machine representation is usually attributed to computers or programs, however, based on the above line of reasoning, it is possible to speak of artificial intelligence in any machine representation. In present days, many scientists and large companies are already involved in the development and research of artificial intelligence, as a result of which we can classify artificial intelligence into three main groups:

- ANI – Artificial Narrow Intelligence: Artificial intelligence that works in a narrow area, it is able to perform goal tasks faster and more efficiently than a human (e.g.: YouTube recommendations, Google duplex, Siri, Waze).

- AGI – Artificial Generic Intelligence: Intelligence similar to the human intellectual level (so far only an idea, but such as: 3CP-O, Jarvis).

- ASI – Artificial Super Intelligence: Any intelligence that surpasses cognitive human performance in all areas.

As it can be seen from the above grouping, actually we can talk about only ANI, i.e. artificial intelligence capable of performing target tasks, however, its effects on social and further research can already be felt. In everyday life, almost all of our electronic devices today have some level of intelligence that supports the solution of a specific task, think, for example, of the possibility of voice control built into smartphones with the help of which we are able to place an online order even with verbal instructions. However, it is worth mentioning that. in addition to the widespread spread, the deployment of intelligent systems is becoming more and more popular nowadays in the business world, where the application of artificial intelligence was previously unthinkable. Replacing office work has always been a challenge for an artificial intelligence due to the complexity of the tasks and the fact that data is usually available in paper form.

1. Intelligence in business life

The advent of business intelligence has opened many new gates for us, such as the successful implementation of data mining, text mining, management decision support systems, and other technologies. However, based on technological development, it is time to reach a higher level and think about the possibilities of creating an intelligent system capable of performing higher, more complex tasks; which can partially or even fully perform certain processes of office work without human intervention. Artificial intelligence is one of the most defining elements of the 20th century, an elusive and unstoppable technological phenomenon; its further growth can be predicted. Earlier innovations have had a significant impact on production from the outset, and thus on the labour market.; initially, it was designed to replace monotonous, simpler routine work (during industrial revolutions); but it has become applicable to more complex processes with the spread of digitalization. It can be observed that this technological-scientific explosion is already blurring the boundaries of informatics, biology and physics and as a result, technology is changing day by day, which can be a challenge to keep up with as

an employee, an employer or a business owner. It is projected that over the next 10 years, most of the administrative jobs will be completed by these solutions. In our view, much of the monotonous, repetitive, thoughtless workflow can be triggered, human resources do not become "bio robots", it helps to optimize productivity by redefining work and redeploying workers to perform higher value activities.

2. The optical character recognition

The effect of artificial intelligence on character recognition is already being felt in large corporate layers. Significant advances have been made in practical use, which can partially or even completely replace human resources in certain work processes. Machine reading has opened new doors in the business world, as the emergence and spread of automated production lines did in the past with the industrial revolution. The Optical Character Recognition (hereinafter: OCR) is a technology that allows you to convert images, scanned or digitally photographed documents and PDF files into editable and text-searchable formats. The resulting texts can be edited, cut, searched and archived, and further electronic processing is possible.

2.1. How OCR works?

OCR technology provides the ability of automatic text recognition for machines, just as the human eyes and brain can do. The human eyes are able to see and read text in the form of images, but it is the brain that processes and interprets this information. It is very difficult, almost impossible, to program this directly into the language of the machines, because in the case of one program we face several problems. There are very few differences between each letter, which a machine must also recognize (for example, the difference between "0" and "o"), and it must also be able to recognize the edges and positions of the letters, they are needed to be separated from the background. They must also specify the size of the letters, which also differs within the document. The technology of OCR is designed to solve these problems so that a machine is able to interpret characters and recognize them at all, just as we humans are able to do so.

3. Employment policy implications of technological development

With the development of industry and technology (in addition to crafting to mechanization and artificial intelligence and the use of OCR), human labour cannot be ruled out.

With the advent of mechanization and robotics, the workforce is playing a role in the production and programming of robots, after which human labour may be pushed out of the process. Many questions arise as to the desirability of this process.

Our aim is to examine how the possibilities of the application of artificial intelligence (including OCR) can be utilized, and how the consequences of their application can be determined in terms of labour law and employment policy. The problems induced by its technological development raise a number of legal issues, given that its further development directives are difficult to predict. Isaac Asimov recorded the main principles of robotics as early as 1950 [3], and a precedent for the legal definition of AI can be found in the legal literature [4]. Peter M. Asaro examined the legal aspects of robotics and AI: are the

laws in force applicable to problems generated by AI? In his view, the rules on product liability apply to the robot as a commercial product [5]. There are also studies in the legal literature that focus specifically on the legal personality of AI, [6] Réka PUSZTAHELYI wrote a dissertation on the moral and ethical aspects of AI [7]. According to Ibolya STEFÁN: „*it is worth addressing the legal challenges of unknown technologies even if they do not seem relevant at the moment*" [8]. In her view, the law can react to emerging innovations later, therefore, preparedness is important both socially and economically, given that a lack of regulation can be an obstacle to economic development; –this would also hinder the widespread use of AI.

Our hypothesis is that artificial intelligence will not make human labour entirely superfluous, but because of its impact on employment, it is timely to address the issue now.

In our view, the employment policy dimension of AI can pose a number of problems in practice, starting with technological unemployment, which may later be followed by exclusion from the labour market and, in the worst case, drifting to the margins of society. In any case, it is indisputable that governments and international organizations must also take into account the (sometimes drastic) social effects of technological development. With the introduction of artificial intelligence and the transformation of the labour market, the majority of workers want to be employed in the service sector instead of production, (in the field of research and development, logistics, etc.). This requires other types of competencies, skills and attitudes on the part of employees, but at the same time, new expectations are emerging on the part of employers.

A certain basic expectation of companies as employers is a certain level of computer proficiency (see our previous research) [9], without this, an employee cannot be hired. At the same time, the employee acquires the skills required to use internal software or the employer's special activities during work, typically with the help of a seconded mentor. Based on the study, it can be said that the most important employee competencies are agility, learning and development ability, as the constant change in the organization and thus in the internal processes requires continuous learning and adaptation. In general, changing employment conditions require new competencies on the part of governments, employers and employees alike: in addition to having professional knowledge, it also requires digital competence.

Referring to research and study at the University of Oxford at the Future of Work conference in London in 2015, it was said that within twenty years, robots will do the work - not only physical but also mental jobs [10]

Reading the study by Acemoglu and Restepo, it can be seen that a dichotomy has developed in the subject under study. One side is of the view that AI depreciates human labour, all based on the fact that with the spread of automation, more jobs will disappear [11]. In their study, Agrawal, Gans, and Goldfarb adapt the framework of Acemoglu and Restrepo to specifically examine the effects of machine learning, which is seen as a tool that can replace human forecasting tasks in areas such as decision-making [12].

According to Gordon, for example, in some jobs, artificial intelligence will replace workers, but this will happen at a steady pace rather than as a sudden upheaval. It is also expected that artificial intelligence will complement workers in other jobs, but in a way that results in only modest productivity gain [13].

A similar research goal was set in the PwC study which examined the effects of automation. Extensive research has assessed the impact of automation on the labour market in each sector. The study states

that the fact that something can be automated in theory does not mean that it is economically or politically viable in practice. The research has been extended to 29 countries and found that only 3 percent of jobs are at risk from automation, but their growth is predictable. The loss of jobs mainly affects women, but the greatest risk is for the low-skilled male workforce [14]. Higher-skilled workers are typically better able to adapt to change, as shown by the Lipták-Mélypataki research [15]. On the other hand, extreme theories that robots can create jobs have come to light [16] Experts from the University of Utrecht approach this position: Thanks to automation, companies can reduce production costs and thus the prices of their products, so that customers can buy more of them [17]. However, according to a report by Boston Consulting, the spread of AI will deepen social inequalities and induce significant unemployment [18].

It can be seen that a number of researches address the social issue of the present study, with several examining the issue from different perspectives. In our view, the rise of AI will not lead to mass unemployment, at least not in the near future. However, changes in the labour market can certainly be pronounced, to which not only labour law but also employment policy measures need to adapt. AI's ability to collect and process large amounts of data can make it an attractive tool to support managerial decision-making, from tracking employee productivity or communication to evaluating candidates and organizing training. AI application also carries significant risks to the work environment.

Scientific and technological advances, the digital revolution, MI and algorithms are new challenges to legal systems, the role of law comes to the fore, rethinking legal institutions and individual categories of law [19]. The legal judgment of AI also covers a significant area of research, primarily with respect to regulatory issues. Given that it is difficult to keep pace with the dynamism of technological development, the regulatory framework is currently in a follow-up mode, after the emergence of technological advances, it seeks to regulate the issue – on the one hand, this is positive, given that the legislation itself is based on empirical knowledge, and on the other hand, it is important to take into account the forthcoming events regarding the development of legal regulations.

The AI that currently surrounds us, which may not even be visible to many of us, has so far made no concrete imprint on legislation. On the one hand, because you it is not aware of its presence, and on the other hand (perhaps for the same reason as the previous reason), the activities of the AI cannot really be traced. In the field of Hungarian regulation, several people have already dealt with the civil law aspects of AI, outlining a set of problems. The legal regulation of AI and robots is based on the definition of their legal status, for which the report of the Committee on Legal Affairs made a novel proposal: the focus was on securing the electronic identities of AIs and robots, whose identities can be legally assessed, based on which the rules of liability can be enforced [20].

The definition of MI itself is plastic, and its legal assessment and interpretation also results in dilemmas and polemics in professional circles. Given that the definition of civil law itself is a matter of debate, its labour law aspect is also problematic.

4. Conclusion

Based on our research results, it is not only the possibility that data that can be extracted and interpreted exclusively by humans can be generated by a machine, but also the possibility of significantly supporting

and even triggering human resource-intensive office workflows with the introduction of artificial intelligence systems in some cases [21]. With the help of a software, we create a practically virtual workforce; the software robot performs essentially the same workflow as an employee - all this much faster with fewer errors [22].

Artificial intelligence and automation can hold huge potential, but of course, all this requires the right regulation and legal framework. The current national legislation does not cover the regulation of computer programs, nor the degree to which they have independent decision-making mechanisms. In our view, it will be essential to develop any abnormal legal regulations for AI in the future, in which the legislator must also define the concept of AI to define its material scope.

Technological developments and artificial intelligence affect all aspects of life, and these relations have an impact on the labour market, which will inevitably attract labour market, and employment policy changes, resulting in that the composition of employment and the employment structure will change, with both expected tax and contribution consequences. Despite the initial complications, we believe that the use of artificial intelligence will also have positive labour market effects in longer term, and both the employers and the employees, as well as the state, can benefit from the acquisition of new competencies. In this respect, artificial intelligence can be seen as a catalyst for the acquisition of new skills.

New principles and new situations are shaping the labour law framework, and already proven employment policy, social instruments and practices are not necessarily suitable for dealing with the situation and mitigating the consequences.

Digitalisation is no longer a matter of choice: companies that do not recognize this are losing their national and international competitiveness, and workers are losing their chances on the labour market. What kind of innovation is needed? In our view, one that contributes to maintaining productivity and the labour market by providing not only longer-term reproduction of the workforce, but also social innovation and sustainable development, as well as strengthening appropriate employment and social policy instruments.

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they may cause, and possibly applying electronic personality to cases where robots make autonomous decisions or otherwise interact with third parties independently;

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