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THE FOURTH INDUSTRIAL REVOLUTION AND ITS ELECTRONIC EMPLOYMENT TECHNOLOGIES. THE CHALLENGES OF EMPLOYMENT IN THE DIGITAL AGE

CZWARTA REWOLUCJA PRZEMYSŁOWA I JEJ ELEKTRONICZNE TECHNOLOGIE ZATRUDNIENIA. WYZWANIA W ERZE CYFROWEJ

Summary: The author analyzes the reports on the fourth industrial revolution and electronic technologies. He tries to show that the transformation, already taking place in the current years is of decisive importance for the construction and development of modern employment relations. There is a serious risk that work organized through employment platforms, may dominate the opportunities that humanity could have from the dynamically developing fourth industrial revolution on the globe. A modern technological transformation, if wisely managed, can lead to an increase in the value of human work. It will continue to be performed by people with a higher level of professional qualifications. An opportunity for those who lose their jobs is to supplement and adapt their professional qualifications to modern technologies. The pre-industrial concept of permanent employment will have to be replaced by the necessity of permanent, systematic education (long-life education). Only it can guarantee the possibility of adaptation to new, modern electronic technologies on the labor market.

Keywords: artificial intelligence, digital technology, electronic employment, human capital, post-industrial era

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Streszczenie: Autor analizuje doniesienia dotyczące czwartej rewolucji przemysłowej i technologii elektronicznych. Stara się pokazać, że dokonujące się już w obecnych latach przemiany mają decydujące znaczenie dla budowy i rozwoju nowoczesnych stosunków pracy. Istnieje poważne ryzyko, że praca zorganizowana poprzez platformy zatrudnienia może zdominować możliwości, jakie ludzkość mogłaby mieć z dynamicznie rozwijającej się czwartej rewolucji przemysłowej na świecie. Nowoczesna transformacja technologiczna, jeśli jest mądrze zarządzana, może doprowadzić do wzrostu wartości pracy ludzkiej. Będzie nadal wykonywana przez osoby o wyższym poziomie kwalifikacji zawodowych. Szansą dla osób tracących pracę jest uzupełnienie i dostosowanie kwalifikacji zawodowych do nowoczesnych technologii. Przedindustrialna koncepcja stałego zatrudnienia będzie musiała zostać zastąpiona koniecznością permanentnej, systematycznej edukacji (kształcenie przez całe życie). Tylko ona może zagwarantować możliwość dostosowania się do nowych, nowoczesnych technologii elektronicznych na rynku pracy.

Słowa kluczowe: sztuczna inteligencja, technologia cyfrowa, elektroniczne zatrudnienie, kapitał ludzki, epoka postindustrialna

INTRODUCTION

The fourth industrial revolution, Industry 4.0, which is currently developing very dynamically, provides specialists in various fields of science, seemingly poorly related, with knowledge about phenomena that could not even be imagined before. With the progress of knowledge about electronic means of communication, it was possible to imagine that modern technologies would become a competitive, even alternative technology used to regulate work processes on the global labour market. A characteristic feature of electronic employment technologies in this era is not only what we have been used to – supporting machines and automatic processes of work previously performed by employees.

Modern employment technologies, which are synonymous with economic and social evolution, lead to economic and civilization growth. However, in employment involving the provision of work by people, it is impossible to consider any activity as work of a different type than that which is regulated by the norms of labour law or civil law. Excessively extensive legal provisions – international, European and national – instruments protecting employees make it difficult for entrepreneurs to conduct professional activity. However, the protective function of the law, developed by trade unions and politicians, does not justify the use of electronic employment technologies, especially in services. Electronic employment technologies enable entrepreneurs to fail to comply with basic obligations, which include: equal treatment of employees, compliance with daily and weekly working time standards, payment of minimum wage rates, universal protection of employment stability and the right to social security benefits. Persons employed

under electronic employment technologies are not entitled to the above-mentioned rights. Entrepreneurs for whom employees perform work do not bear any risk towards them. However, they did not explain the phenomenon of electronic employment technology, expressed in its constant and systematic growth, despite sometimes significant differences, to the disadvantage of employees who work under employment relationships or on the basis of civil law contracts.

The above disproportion is clearly visible in cases relating to remuneration for work performed by employees considered to be "freelancers", sole proprietors or enthusiasts. The authorities of the European Union countries did not react to the postulates put forward by trade unions about the need to regulate the legal phenomenon of work and employment in the period of digitalisation. The reports WEF, IMF, and ILO reveal the lack of orientation of state authorities and other interested parties, mainly social partners, in matters relating to the scope of the phenomenon of electronic employment technologies. The ILO, IMF, and WEF aim to develop a strategy to ensure that people continue to work in conditions changed by modern technology. In the preface to the second report on the future of work[1], attention was drawn to the need to understand the potential of modern technologies, in particular automation and algorithms, which can lead to an increase in the importance of human work, improvement of professional qualifications employees, increase their productivity or lead to mass layoffs. The fourth industrial revolution can be used as a fundamental investment in human capital or treated as a "tsunami" eliminating the uneducated workforce unable to adapt to new, revolutionary technological requirements.

THE POTENTIAL OF MODERN TECHNOLOGIES

Wisely managed, new technologies can lead humanity into an era conducive to the development of work at a higher level than hitherto. Poor management of technological processes will certainly be conducive to negative phenomena for people and their societies: deepening and further professional stratification of employees, greater inequality among social groups on labour markets, further polarization of professionally active people. Assuming the irreversibility of the fourth industrial revolution, the forecast formulated in the World Economic Forum report on the future of work should be accepted. The forces driving the changes of the existing, traditional markets and labour relations are caused by irreversible processes inspired by new technologies closely related to widely available, cheap, fast, mobile and widespread, advanced electronic information transfer techniques. Distributed registers (ledger

[1] WUF, *Preface: The Future of Jobs Insight Report*, Geneva, Switzerland: World Economic Forum, http://reports.weforum.org/future-of-jobs-2018/.

technologies), enabling the implementation of tasks on large, diverse and variable sets (big data analytics), allow entrepreneurs to freely use artificial intelligence (artificial intelligence). Constructing unlimited chains of sequences of sets of serious functional value (compositions of value chains) can foster economic development processes. The same can be said about modern technologies that allow the storage and management of information located in the "technological cloud". Modern technologies will not significantly change the basic feature of employee employment, which is the subordination of the person providing work (employee) directly to the employer or to another employee employed in a managerial position in the plant, representing the interests of the employer. The above statement will not lose its application in cases relating to the replacement of a human by a mechanical device.

Technological devices and processes will lead to a shift in workplaces of the existing boundaries of work reserved and performed by people (employees) and/or machines, set in previous industrial eras (Industry 1, 2 and 3). Modern machines are capable of performing more advanced tasks. In medicine, for example, they can recognize the signs of a disease, make an accurate diagnosis (medical technology – meditech), in law assess the compliance of the parties to the contract with the terms of the contract (law technology – law tech), in finance recognize and select investments that are beneficial for the client, in art compose a piece of music, reproduce a famous painting, or even paint an original work[2]. The fourth industrial revolution enables artificial intelligence to perform mental tasks and activities that in previous industrial revolutions could only be mechanically reproduced.

There are three reasons for this fundamental change in employment technology: 1) the low cost of production and the huge popularity of smart phones equipped with incredibly large possibilities of searching, storing and associating complex, various information; 2) universal, free access to the Internet, including a central source of data storage; 3) a significant reduction in the prices of digital technologies that enable the establishment of small, rapidly multiplying technological plants (start-ups)[3]. The reasons mentioned above made it possible in a relatively short time to build such technological giants dealing with the design and production of consumer electronics, electronic commerce, collecting, cataloging and sharing global information resources and enabling the exchange of information - such as Apple, Amazon, Google, Facebook. The acceleration in the development of technological devices was so great that, according to specialists, it could pose a real threat to traditional labour markets[4]. Labour productivity remained

[2] E. Ernst, R. Merola, D. Samaan, *The economics of artificial intelligence: Implications for the future of work*, Research Paper 5, 2018, ILO Research Department, Geneva 2018, p. 35.

[3] J.E. Bessen, *Information technology and industry concentration*, Law and Economics Research Paper No. 17-09, 2017, Boston University School of Law, December 1st, https://ssrn.co/abstract=3044730http://dx.doi.org/10.2139/ssrn.3078715 [available: 11.04.2023].

[4] E. Ernst, *Is technological change accelerating?*, ILO briefing for the Global Commission on the Future of Work, ILO, Geneva 2015.

at the previous level, preceding the fourth industrial revolution, and even decreased in some economically advanced countries, slowly regaining the previous (pre-2008) rate of economic growth[5]. On the other hand, the gap in income between the highest and lowest earners in almost all countries was widening. The above economic and social tendencies aroused concern among representatives of social sciences, who feared the existence of hidden dependencies between the rate of development of modern technologies and the slowdown in the steady growth of the economy[6]. A team of researchers from the University of Oxford (clearly commented on the cause-and-effect relationship between the development of modern technologies, which are competition for people who have been employed so far, and the loss of employment by a significant part of professionally active people. In the research devoted to the resilience of the labour markets in Great Britain and the United States to the phenomenon of a significant and rapid growth of modern technologies, 35% of employees in Great Britain and 45% in the USA were warned about the possibility of losing their jobs in the next 20 years[7]. According to the World Bank, the situation is much worse in the developing Asian countries with the largest number and growth of population – China and India. The development of technology may lead to the elimination of 66% (China) and 77% (India) of employees from the labour markets in these countries[8]. At that time, the above forecasts were not confirmed by studies commissioned by the Organization for Economic Co-operation and Development – OECD[9]. However, doubts have been sown in the social sciences about the strong destructive impact of the development of technological devices on labour markets in individual countries and on a global scale in the future[10].

THE DIVISION OF LABOUR BETWEEN HUMANS AND MACHINES DURING THE FOURTH INDUSTRIAL REVOLUTION

The demarcation line determining the division of work performed by machines and people will be marked by the "parallel" of 62%. Therefore, human participation

[5] World Employment and Social Outlook: Trends, Report, 16 January 2023, 9789220372920 (web PDF)[ISBN].

[6] D. Méda, *The future of work. The meaning and value of work in Europe*, ILO Research-Paper, No. 18, Geneva, 2016; A. Korinek, J. Stiglitz, *Artificial Intelligence and Its Implications for Income Distribution and Unemployment* ,Working Paper 24174 DOI 10.3386/w24174, Issue Date December 2017.

[7] C.B. Frey and M. Osborne, *The Future of Employment: How susceptible are jobs to computerization?*, View Journal Article / Working Paper, 2013.

[8] World Development Report, Digital dividends, Washington D.C. 2016; World Economic Forum, Accelerating Gender Parity in the fourth industrial revolution, Washington D.C. 2017; World Economic Forum, Realizing Human Potential in the Fourth Industrial Revolution, Washington D.C.2017; World Economic Forum, Robot Revolution. The Economic of Automation, Geneva 2018.

[9] M. Arntz, T. Gregory, U. Zierahn, *Revisiting the risk of automation,* Economics Letters have been discussed in the special session on Economics and Artificial Intelligence at the 2017 ASSA meetings.

[10] R. Wike, B. Stokes, *In advanced and emerging economies alike, worries about job automation,* 2018, Pew Research Center, Global Attitudes & Trends, pewglobal.org.

in labour processes can be reduced to 38%. To a lesser extent, in the middle of the delimiting threshold, the participation of human beings and machines in work processes provided by employees will be limited in some spheres of services: communication, interaction of employees, contacts with employers, enterprise management, development of service enterprises. Advising clients, making important decisions regarding the functioning of a service enterprise will be automated to a lesser extent. Machines are expected to replace humans in the work processes performed in these service industries in the range of 27 to 30%. The share of modern technologies in those industries where the most important function is the duty of decision makers to justify the reasons for making certain decisions and decisions made is even less marked. The classic example is the judiciary. Despite the progressing automation of work in the judiciary and administration, it cannot be expected that decisions made by competent decision-makers can be convincingly justified by devices classified as global artificial intelligence (GAI). Of course, I am writing about original decisions, not about copying decisions considered indisputable. However, even in this category of cases, human intervention may be necessary when automatic solutions, taking into account the most typical situations, require a departure – due to specific circumstances – from the established practice. The most important, however, are short-term forecasts, according to which there was, is or will be a percentage increase in employment in those professional sectors that have not been and probably will not be eliminated by modern machines and technological devices. Between 16 and 27% of people are expected to find employment in the new professions created by the fourth industrial revolution . Expressing the above hypothesis not in percentages, but in absolute numbers, the authors of the report on the past and future of work analyzed in this article officially admit that in their representative population of 15 million people functioning on labour markets, the decrease in employment will be 0, 98 million jobs where workers were employed on the eve of the fourth industrial revolution. A much more serious, for professionally active people, direct effect of changes in the labour markets, caused by the replacement of workers by modern machines and technologies, will be an increase in the number of new, hitherto unknown types of work and tasks to be performed by people on labour markets. The number of these works and tasks is estimated at 1 billion 74 million. 75 million new jobs will be created by the changes that will occur due to the replacement of jobs previously done by humans with machines (robots). In addition, the fourth industrial revolution will force entrepreneurs to create new, previously unknown, jobs. The Future of Work report puts the number of these jobs at 133 million. The roles in which these people will play on the labour markets are an open question – employees employed under civil law contracts or self-employed. The authors of the report do not deal with this issue. The fourth industrial revolution will cause a large-scale loss of the raison d'être of work that, thanks to modern technologies, could still be performed by machines. Simultaneously with these processes, thanks to modern technologies, the

development of new professional sectors will probably take place. The above phenomena will primarily take place in the sphere of services. However, they will not completely bypass industrial sectors. Leveling the disproportion between the work of people and machines, which will certainly take place during the current industrial revolution. However, it is not known whether in cases concerning the relationship between supply and demand for activities involving work performed using changed technologies, it will lead to a surplus or loss of jobs and jobs. Filling these positions will require a different educational and specialist preparation of people at the age of professional activity who want to continue working. In my opinion, the main challenge at the moment is to achieve the goal of changing the attitude to digital technologies of employment of people in working and pre-working age in the relatively shortest possible time horizon. The implementation of this postulate is absolutely necessary for the professional preparation of people whose jobs have been assigned.

WORK AND PROFESSIONAL SKILLS

Automation of work tasks, which will be subjected to works in which machines will replace people in the near future, will change the characteristic profiles of individual types of work. Whether particular types of work will be liquidated will depend on the market demand for specific products or services[11]. Therefore, work automation processes cannot be combined with the need to liquidate individual jobs and the resulting need to dismiss people who have previously performed mechanized activities[12]. The mere liquidation of a specific type of work and/or jobs is not a sufficient basis for terminating employment contracts with all employees occupying the liquidated positions. Some employees may prove useful for supervising automatic activities performed by machines. The classic example given in the professional literature is the position of an airplane pilot. The introduction of a mechanism capable of performing all the activities previously performed by a human pilot, from take-off to landing, was not a sufficient justification for dismissing part of the aircraft crew (captain and first officer), because from the point of view of protecting the life and health of passengers and the safety of other people, as well as expensive equipment, it is necessary to exercise continuous human control over the correct operation of mechanical devices. People with high professional qualifications are needed to program, control and supervise machines replacing the work previously performed by humans. The tasks assigned to contractors (employees) in work processes by employers (employers) are subject to change. Ma-

[11] J.E. Bessen, *Information technology and industry concentration*, Law and Economics Research Paper No. 17-09, Boston University School of Law and Economics, December 1st, 2017, https://ssrn.com/abstracr=3044730.

[12] J. Albertini, J. Hairault, J.O. Langot, & T. Spraseuth, *A tale of two countries: A story of the French and US polarization,* IZA Discussion Paper No. 1103, (2017), Bonn.

chines and automation processes can fully replace activities previously performed by humans only when the performance of work is one hundred percent according to plan. At the current stage of technology development, it is possible to equip devices with the ability to modify the activities planned and saved by the human in the machine's memory. Due to the absolute need to protect human life and health as well as high-value property, it is not possible to leave automatic devices unattended. With the progress in the processes of using automated machines and advanced technological devices to perform work, the demand for specialists capable of operating them has increased. In the past, it was unprofitable, if only because of the low labour costs of a manual worker, to replace people performing uncomplicated activities with machines. Nowadays, the increase in professional qualifications of employees employed in economically more developed countries has led to a reduction in the difference in earnings between those employed in jobs requiring certain, although occurring to a varying degree, more or less, professional qualifications. However, sweatshops, widely recognized in civilized and economically developed countries as a sign of social pathology, operate not only in Asia. The Chinese employed in such plants can also be found in the USA. Among others, these plants and the people employed in them contributed to reducing the differences in earnings between the lowest and lower ranked employees[13]. Currently, however, the demand for the work of completely unskilled workers has decreased in a significant part of some economically developed countries. The fourth industrial revolution caused an increase in the demand for employees with professional qualifications to operate and service more complex machines and devices. Modern technologies have both improved the professional qualifications of employees and increased the productivity of trained workers, hitherto considered unskilled or low-skilled, and contributed to reducing the demand for averagely qualified workers, considered professionals before the fourth industrial revolution. However, the above statement does not mean shifting the main, unfavorable for employees, consequences of automation and modern technologies to groups of employees with average professional qualifications. The deterioration of the situation of employed people who do not have sufficiently high qualifications and skills preferred by the technological changes introduced by the fourth industrial revolution to the era of post-industrial employment depends primarily on the demand for new services and – to a certain, lesser extent – also for products for which there will be demand in the post-industrial era[14].

However, the above statement does not mean shifting the main, unfavorable for employees, consequences of automation and modern technologies to groups of employees with average professional qualifications. The deterioration of the situa-

[13] C. Goldin, L. Katz, *The origins of technology-skill complementarily*, Quarterly Journal of Economic, vol. 112, No. 2, 1998.

[14] E. Ernst, L. Chentouf,, *Working organisation and incentives*, Global Local Economies Review, vol. 18(1), 2014, pp. 103-135.

tion of employed people who do not have sufficiently high qualifications and skills preferred by the technological changes introduced by the fourth industrial revolution to the era of post-industrial employment depends primarily on the demand for new services and – to a certain, lesser extent - also for products for which there will be demand in the post-industrial era[15]. Technological changes do not take place equally and to the same extent in all sectors of the economy[16].

ARTIFICIAL INTELLIGENCE

Artificial intelligence (AI) plays a special role in short-term predictions about the future of work. This term covers applications that have a significant impact on the mental work previously performed by people professionally active in various professional sectors[17]. Lawyers see artificial intelligence as "information systems capable of replacing intelligent human activities"[18] In the post-industrial era focused on providing services, the use of artificial intelligence most often occurs in situations requiring associating people and entities reporting a need for the provision of services of a certain type with people specializing in providing services of this type. These are services consisting in finding and adjusting parties to legal relations (service providers and service recipients), which may be established, for example, among people interested in transport (Uber taxi, Lyft), searching for accommodation (AirBnB), retail valuable, rare items, mediating in the employment of specialists. Modern, quick and cheap techniques of "matching" professional abilities, desired skills that potential service providers, sought after by service recipients, have or may have, can be implemented by modern electronic information processing machines (computers) more professionally and comprehensively than similar activities exploration activities hitherto performed by humans. The pace of development of atypical forms of employment, dynamically developing during the fourth industrial revolution and electronic employment relations, is the best example confirming the correctness of the hypothesis about the impossibility of completely replacing human work. Artificial intelligence, on the other hand, is irreplaceable in the processes of analyzing and classifying, searching and identifying people, facts, events and circumstances sought by persons and entities interested in obtaining all necessary information on matters relating to medicine (health), law (legal situation of the parties to contracts),

[15] E. Ernst, R. Merola, D. Samaan, *The Economics of Artificial Intelligence: Implications for Future work*, Research Paper 5, 2018, ILO Research Department, Geneva.

[16] J. Bessen, *How Computer automation affects occupations: Technology, jobs, and skills*, Law and Economic Research Paper, No.15-49, 2015, Boston University School of Law, Boston.

[17] J. Furman, R. Seamans, *AI and the economy*, National Bureau Economic Research, Paper, No. 24680, 2018, Cambridge, Mass.

[18] R. Markiewicz, *Artificial intelligence and intellectual property*, inaugural lecture beginning the 655th academic year of the Jagiellonian University in Krakow, 2019.

finance (accounting, audit), employment in managerial positions (review and evaluation of candidates), work efficiency, scientific activity (evaluation of the success of planned research experiments). Computers are able to assess the percentage chances of success or failure of activities planned by a potential service provider[19]. Artificial intelligence also plays an important role in the process of implementing the activities and activities outlined above, aimed at recognizing the chances of implementing the planned plans and developing the most effective actions to implement them and achieve the desired results. In the two above-mentioned categories of potential activities, artificial intelligence enables interested persons and entities involved in the conduct of specific projects to select contractors and conduct simulations that enable the classification of individual tasks and the development of an opinion on the degree of difficulty of their implementation and the chances of achieving the intended goal. Artificial intelligence is also used in the processes of composing the chain of the most functional and valuable sequences of activities, enabling the implementation of the prepared project. In the first and second phases of the procedure, the point is to replace complicated or impossible tasks by computers. They may be too complicated and/or expensive. It is assumed that in the third phase of the industrial revolution, the use of all modern technologies necessary to carry out the planned activities will involve, depending on the needs, people, devices and modern technologies[20].

ADAPTATION OF PROFESSIONAL QUALIFICATIONS TO MODERN TECHNOLOGIES

Technological progress introduced by the fourth industrial revolution should be treated by employees as an opportunity to raise professional qualifications. Societies and their state organizations unprepared for the changes resulting from the rules introduced by the first wave of the fourth industrial revolution may consider this to be the ruthless and inhumane end of the previous era in labor relations, based on the ILO principles of protecting workers as the weaker party of industrial relations. However, until the authorities of the ILO member states implement the concept of universal basic income for people who have lost their jobs as a result of replacing human work with automatic, intelligent machines and modern technologies, efforts should be made to take advantage of from the opportunity to raise professional qualifications created by the fourth industrial revolution for all employees[21]. Already at the beginning of the

[19] I.M. Cockburn, R. Henderson, S. Stern, *The impact of artificial intelligence on innovation*, National Bureau of Economic Research, Working Paper No. 24449, 2018, Cambridge, Mass.

[20] E. Ernst, R. Merola, D. Samaan, The economics of artificial intelligence: Implications for future of work, Research Paper 5, ILO Research Department, Geneva 2018.

[21] M. Zwolinski, *The Pragmatic Libertarian Case for a Basic Income Guarantee*, Cato-Unbound (4 August 2014), https://www:cato-unbound.org/2014/08/04/matt-zwolinski/pragmatic-libertarian-case-basic-income guarantee?version=metter+at-t-0&module=metter- Links&pgtype=arti-

fourth industrial revolution, employees are familiar with the need to cooperate with machines, technologies, programs and applications. Already a few years ago, in the "information and data processing" segment, almost half of the time of the daily working day of each employee consisted in the use of automatic devices and modern technologies. In 2022, an increase – up to 62% – of the share of artificial intelligence in work consisting in the provision of services not only by humans was assessed. To a lesser extent, the participation of intelligent machines, devices, technologies and software is expected in the work consisting in making and justifying decisions by employees managing workplaces and making substantive decisions in labor relations and processes. However, even in this sphere, the most specific one, as it requires personal participation and human involvement, the employees' use of the support of machines and devices as well as technology during the working day is estimated at one-fifth of the working time of a person holding a managerial position . The use of automatic devices in work processes has led to a 30% increase in the average labor productivity of people employed in services and industry over the last few years[22]. In the next expansion phase of the fourth industrial revolution, there will be an increase in demand for analytical thinking and innovation, creativity, originality – related to the ability to independently actively expand the knowledge base. This is possible – in conjunction with emotional intelligence – by mastering modern self-education strategies. The ability to conduct logical arguments, present a vision of professional activity development, combined with the opportunities offered by modern technologies, devices and their software, play a decisive role in the activities undertaken by specialists in human capital management during the fourth industrial revolution. These activities are aimed at maximizing the growth of values that determine the demand for work due to the above-average professional skills of some categories of people at the age of economic activity and minimizing losses among other people belonging to the same social category. Employees who lack the features that enable smooth professional adaptation to the requirements introduced by the fourth industrial revolution will certainly play a secondary role on the labor market. To a lesser extent than other employees, who more easily acquire the necessary professional knowledge and improve professional skills, they will be able to use modern machines, devices, more sophisticated technologies and software in work processes. The slower growth in the value of their professional skills will contribute to reducing the demand for their work[23]. Over time, such professional activities will be liquidated by entrepreneurs. Such decisions taken by entrepreneurs for technological reasons should not be treated as failures of the employed. Technology does not prevent

cle&contentId=&medial=&referrer=htps%3A%2F%www.google.com%2F&priority= true &action=click&contentCollection=meter=links-click [available: 11.04.2023].

[22] J. Ravin, J. Boudreau, *Thinking trough how automation will effect work force*, Harvard Business Review, April 2017 [https//store.hbr.org.product>thi… [available: 11.102023].

[23] A. Rajadhyaksa, A. Chatterjee, (2018), *Robots at the gate: humans and technology at work*, http://hdl.voced.edu.au/10707/453972.

work. It only deprives people of employment who, due to the lack of knowledge and skills, are unable to adapt to the requirements imposed on employees by modern technologies. On the other hand, the value of work provided by employees who have managed to adapt to the changed technological conditions will increase[24]. In conditions still modified by the fourth industrial revolution, entrepreneurs employing "human capital" using the latest machines, technological devices, software and artificial intelligence have a chance to succeed in the post-industrial era.

THE FUTURE OF HUMAN WORK

A special report developed by MITSloan and Deloitte[25] advertises as the only, safest panacea for business, enabling employees and employers to survive the fourth industrial revolution, "slow processing of digital information in business". Taking into account earlier research – conducted in 2016 by McKinsey and Company[26] – on the consequences of technological changes resulting from the fourth industrial revolution, one can try to draw moderately positive conclusions about the attitude of the parties to labour relations to the future of work in the post-industrial era. Employment relationships protected by labour law will be replaced by job platforms in the relatively near future. The point is that the above exchange should be beneficial for working people[27]. There is a serious risk that legally unregulated relations between people providing work on an *ad hoc* basis (gig economy), organized through employment platforms, may dominate the opportunities that humanity could have from the dynamically developing fourth industrial revolution on the globe.

CONCLUSIONS

The fourth industrial revolution (Industry 4.0) blurs the existing boundary between work performed by humans and performed by machines, technology, algorithms, and artificial intelligence. A modern technological transformation, if wisely managed, can lead to an increase in the value of human work. The problem is that many employees are afraid that machines, robots, algorithms, modern technologies, artificial intelligence will take away people's jobs. The point is that only certain types

[24] H. David, F. Levy, R. Murnane, *Upstairs, Downstairs: Computer-Skill Complementarily and Computer-Labor Substitution on Two Floors of a Large Bank*, Working Paper 7890, DOI 10.3386/w7890 Issue (Date: September 2000).

[25] V. Govindarajan, J.R. Immelt, *The Only Way Manufacturers Can Survive*, Length: 12 page(s), Publication Date: Apr 1, 2019, Discipline: Strategy, Product #: SMR763-PDF-ENG.

[26] Independent Work (2016): *Choice, Necessity, and the GIG Economy*, McKinsey Global Institute and Company, October 2016.

[27] ILO Century Declaration for the Future of Work adopted by the Conference at its, 108th Session of the International Labour Conference 10-21 June 2019, Geneva 21 June 2019.

of work can be replaced by machines for the benefit of society. On the other hand, the value of work as such will increase and will continue to be performed by people with a higher level of professional qualifications. An opportunity for those who lose their jobs is to supplement and adapt their professional qualifications to modern technologies. This, in turn, requires a fundamental change in attitudes towards training for employees and people entering the labour market. The concept of long-life employment, which dominated in previous eras, should be replaced in the post-industrial era with the necessity of permanent, systematic education (long-life education), which may guarantee the possibility of obtaining temporary employment and adaptation to new, modern electronic technologies on the market work.

The post-industrial era in the global economy is a process that cannot be reversed. However, it can be steered in such a way as to take advantage of the opportunity offered by the development of innovative employment technologies for economic growth and the desired civilization changes in individual societies.

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