THE IMPACT OF INTELLIGENT MANUFACTURING ON THE WAGES POLICY OF THE LABOR MARKET OF THE SLOVAK REPUBLIC

Simona HYŽOVÁ* – Kamila MAYEROVÁ

[1] *Faculty of Social and Economic Relations, Alexander Dubček University in Trenčín, Študentská 3, 911 50 Trenčín, Slovak Republic*

*Corresponding author E-mail address: simona.hyzova@tnuni.sk

Abstract

We live in a time when there are constant changes to the daily order. People live for social networks, the internet, use various modern technologies. Innovations are part of our lives, and so, in recent years, concepts are used as artificial intelligence and intelligent production that affects and replaces human strength. For Slovakia, it is a new concept yet, but in the future it will affect our lives, a lot of people will lose jobs, and those who work with the factors will work at high wages. In intelligent manufacturing, new technologies and techniques are needed to improve production whether in the automotive or wood industry. We try to draw attention to the fact that the workforce operating under artificial intelligence conditions earns more than ordinary workers who work manually and get more at lower wages.

Keywords: Wages, intelligent manufacturing, artificial intelligence, labor market, innovation.

1 Introduction

„Company success creates individuals. Successful individuals create a successful team."

Milan Gregor

We live in a time that moves forward, The 21st Century fills us the door to things and features that people have not yet known. It changes the requirements of the customer, employer or employee. A person in his or her current life uses modern technologies (car, phone, notebook) that are continually improving and innovating. Employers also use state-of-the-art technology for staffing, staff selection, appraisal, and remuneration. Future employees search through social networks, job portals, or agencies. They use state-of-the-art electronic devices at work. Employee records are conducted using devices that are connected via a computer. They use various applications for effective marketing. As time changes, the door opens with a relatively new term such as artificial intelligence and intelligent production. By changing the current situation on the labor market, the wage issues change. This is one of the most serious problems facing the labor force in Slovakia. The current situation in the labor market offers different conditions for remuneration of employees. We see the widening of the wage differentiation of employees on the labor market, which is affected by various factors. Wages are among the most important components of the income of the population of the Slovak Republic and also account for the largest part of the costs for employers. From the point of view of each employee, wage is an important factor, because it significantly affects its prosperity and the quality of future life. The wage is the determined position of employees in the company and their potential for personal growth in the work and social sphere.

1.1 Intelligent Industry in the Labor Market

Wage represents the cost of labor resulting from the functioning of the market. It results from job offer and demand for work and is the reward of the human capital owner. It is a general term for wages, salaries and other forms of remuneration and compensation for the work done (Ivanová, 2007).

Wages according to Labor Code 311/2001 Coll. is defined in §118 as: "cash performance or performance of the monetary value (in-kind wage) provided by the employer to the employee for work."

Wage conditions are the result of an agreement between the employer and the relevant trade union body listed in the collective agreement or agreement with the employee in the employment contract, the wage being not less than the minimum wage laid down in the special regulations.

In Slovakia, the average wage is 1004 €. Compared to the European Union, only six countries (Poland, Latvia, Hungary, Lithuania, Romania, Bulgaria) have a lower average wage. The highest average wage, exceeding 4 000

€, is in Luxembourg, Denmark and the Netherlands (Eurostat, 2018).When comparing the average wage among the various branches in Slovakia, we can see that the highest average wage is in the financial and insurance services and information and communication sectors, which is between 1700 and 1900 €. In other sectors, such as industry, mining, wholesale and retail, transport, education and health, the average wage ranges between around 1000 €. The lowest average wage is in the housing and catering sector (SO, 2018).

Compared with previous years, wages in Slovakia are growing every year despite the fact that the labor market is affected by globalization, demographic and technological change. These changes, especially automatization, bring with them not only threats but also new opportunities. On the one hand, technology in some activities replaces labor, but on the other hand they create new job opportunities. However, new trends and challenges make it necessary to adapt education and employment policies, as machines and computers can only replace routine and manual work. They do not have analytical and social skills and can not think creatively, so the labor market requires specific types of skills from the workforce. In order to prevent the impact of automation, lifelong learning is focused on the acquisition of professional skills, with higher education being the less likely the threat of automatiozation.

1.2 Artificial Intelligence

Artificial Intelligence is all around us either in the calculator or on our cell phones. According to Kostelnik (2009, p. 89), its definition is as follows: "Artificial intelligence, as a disciplinary discipline, involves extremely many sub - disciplines and diametrically different approaches to automatically and efficiently deal with whole classes of tasks of various types. It is under the wings of computer science that deals with computer systems that affect human intelligence. It has two basic approaches, namely symbolic artificial intelligence, which means that a person thinks and communicates with symbols and sub-symbolic intelligence that does not use symbols but works at the level of numbers and deals with how the human brain works.

With artificial intelligence, intelligent production has to be mentioned and defined. Intelligent production is the use of production process technologies that can automatically adapt to changing environments and different process requirements, with the ability to produce various products with minimal supervision and operators. It is the development and implementation of artificial intelligence into production (Chen, 2017). Intelligent production management means the growing category of technologies to manage and improve all aspects of the production process. It includes a comprehensive set of solutions that help users at all levels of the organization to perform critical production functions more efficiently. Hardware and software applications cover a wide range of features to manage key areas of the production lifecycle, ranging from plant process control to analyzing and sharing performance data with asset management across an organization. Finally, intelligent manufacturing management is an opportunity for companies to reduce costs, increase productivity and improve quality by optimizing the performance of their production processes (Coetzee, 2004).

The era of intelligent manufacturing is here. With constant changes that destabilize the competitive environment, it is harder for manufacturers to create value through traditional business models. Customers today have more options and less brand loyalty than ever before. Markets are also more competitive and faster, thanks to the time trading model. Raising wages and other costs increases further complexity.

Flexible production based on digital technologies becomes the norm. Intelligent connected systems enable machines and people to collaborate on "mass adaptation," where factories maintain production efficiency and quickly create personal products for very specific customer needs. Manufacturers also begin to expand their leading service and increase customer engagement.

With real-time eco-system devices, devices and sensors, manufacturers are allowed to create exceptional customer experiences and build long-term relationships with users. Investing in intelligent manufacturing helps companies increase chain value and become more flexible, more productive and more competitive. The introduction of artificial intelligence and machine learning enables them to accurately manage real-time devices, sensors, robots and other systems, and to create practical knowledge from their data.

Building a digital factory requires a long-term perspective. Managing change and motivating others with a vision of the future are core skills, as intelligent production paths can be unpredictable. The leaders of tomorrow must be curious and passionate, which creates a perspective corporate culture. Without these attributes, long-term competitiveness turns out to be opaque and is lost in the effort of immediate results.

Intelligent factories optimize their organizational structure to increase productivity and minimize costs. They have exactly the size of the workforce they need, with an emphasis on employing and training people with IT skills. Staff of the future will be technical and talented. The new information and communication infrastructure will require less energy and will be cleaner and more efficient than traditional technologies, which will lead to less impact on the environment.

Intelligent manufacturing far more than just technology. It touches all aspects of the manufacturing process, including human capital, quality control, environmental issues, and more. Intelligent producers need to strike the right balance between exploiting existing talents and new technologies, between direct income and environmental impact, and providing support for workers and providing opportunities to improve their skills.

The switch to intelligent manufacturing requires companies to combine advanced operations and information technologies to enable joint design, virtual simulation, data planning and analysis. This requires the visibility and sharing of information between all parties in the supply chain, from the factory floor to the distributor, seller or consumer, with synchronized processes and zero inventory. However, it is difficult to achieve, because in the traditional production systems there is data in force.

Communication between human and computer, which is required for intelligent manufacturing, is also beyond the capabilities of older IT infrastructure. It increases productivity by avoiding the need to turn off equipment for faults or unauthorized routine maintenance. However, in order to accurately predict when maintenance is required, the plant data and actual operating conditions must be available and analyzed in real time. These data must also trigger work orders and inventory management of spare parts and ensure that regulatory requirements are met (Huawei, 2018).

Intelligent manufacturing is a convergence of capabilities from multiple areas in order to improve productivity. It is a point where intelligent business processes, intelligent operating processes, intelligent devices and smart product definitions meet. There is a broad production concept to optimize production and product transactions with full use of advanced information and manufacturing technologies.

This is considered to be a new production model based on intelligent science and technology that greatly enhances the design, production, management and integration of the whole life cycle of a typical product. The entire lifecycle of a product can be facilitated by the use of various intelligent sensors, adaptive decision models, modern materials, intelligent devices and data analysis.

A competitive manufacturing company can be strengthened by its ability to counter the dynamics and fluctuations of the global market. One form of realization of this concept is intelligent production, which is considered to be the next generation of the production system, which is obtained by adopting new models, new forms and new methodologies for transforming the traditional production system into the intelligent system (Chen, 2017).

The intelligent manufacturing model combines the process and technology to offer an opportunity to eliminate problems that negatively affect operations. Integrated and effective workflows support modeling and a common view of the refinery, enabling a common understanding of forecasts, operational capabilities, problems and risks.

The benefits of intelligent manufacturing include, for example, significant cost savings for system support, resource maintenance and effort, easy access to key metrics, data from a variety of sources, engineering and procedural content and collaboration, visibility, and transparent navigation through role-based views, which shows common views of the operating parameters of shifts, teams, departments, and organizations.

The intelligent factory is not an entirely clear form of a future factory, but it is somewhat indicative of the Audi patent of 2013. Today's line concept is replaced by functional relationships. The production line will disappear and the entire hall will occupy autonomous workplaces, competent islands. Equipped with intelligent robots will do the specified operations, and the product will move between them as needed on robotic platforms. The production system will thus consist of small, highly flexible production units. Whilst Henry Ford dominates the production line and its tact, the product itself is more or less passive.

In intelligent manufacturing it will be different. The product being manufactured will act as an intelligent entity that communicates with your environment and organizes your processing - determines operations and schedules them. All production facilities and service logistics robots will communicate with each other and, in real time, will follow the product's best-of-breed approach in an optimal and efficient manner.

"In an intelligent factory, you would be unnecessarily looking for a production line. From today's point of view, production would seem to be a complete chaos - material, semi-finished products, processed production, or mobile robots are moving unplanned, as if without a goal. But each of them will follow the strict logic of the superior

level, which at the same time will allow for relatively autonomous behavior. In fact, organized chaos will be"(Gregor, 2017).

According to Kvašňák (2017), managers of Slovak companies thought that trends such as logistics robots, artificial intelligence, automation and virtualization may not even be addressed because they are only addressed in the West and Slovakia. However, if Slovakia wants to maintain industrial manufacturing, it is not just cheap labor and a favorable geographic location because foreign carmakers and their suppliers will be looking for companies using intelligent manufacturing elements.

Unless Slovakia creates the conditions for the use of intelligent production, it is threatening that industrial production will go to the West where these conditions are created.With the introduction of intelligent manufacturing in enterprises, the demands for staff skills and intellect are growing, causing a large number of people who can not apply and employ under new conditions. This creates a duty for the state to tackle unemployment and to address the qualification and education of the workforce. The first step on the part of the state was the creation of the "Intelligent Industry" concept.

The "Intelligent industry" concept was created to transform and strengthen the industry through technology development. In Slovakia, it was created in cooperation with the Ministry of Economy of the Slovak Republic with industry representatives in response to the Fourth Industrial Revolution. Its goal was to introduce the intelligent industry to the public, as some entrepreneurs perceive it as a threat. Information is intended to help make better use of the potential of businesses, how best to use their resources and how to seize new opportunities (MHSR, 2018).

2 Description of the approach, work methodology, materials for research, assumptions, experiments, etc.

The aim of this article is to clarify the issue of wages in terms of intelligent manufacturing. To characterize intelligent production associated with artificial intelligence, because people regard these terms as scifi, something unbelievable, cosmic, and nowadays commonly used. It is a phenomenon that will affect our lives in the future, whether in ordinary or working life. The aim is also to focus on workers working with machinery that is controlled by artificial intelligence. Identify their wages versus the normal work force that does not work under artificial intelligence. The methods we used to collect basic information were statistical data from the Statistical Office of the Slovak Republic. We used the analysis, the comparative method and the synthesis. We also worked with the information we received from Slovak professors and scientists who spoke about artificial intelligence and intelligent production at various conferences organized in Slovakia.

3 Description of achieved results

According to OECD sources (Arntz et al., 2016), Slovakia is the country most threatening the impact of the substitution effect on the labor market. Currently, it is protected from massive automation by cheap labor. However, in the future, the scope of automation will increase as the structure of the Slovak economy depends on the means of transport, machinery, computers and electronics. Just 70% of the world's robot installations have taken place in these industries. In Slovakia, a large number of jobs can be replaced by machines, but in small and medium-sized enterprises, wage costs are still cheaper than automation costs.

In large foreign companies operating in Slovakia due to the decreasing automation costs, the risk of so- reshoring - the return of the company to the motherland, because the so- offshoring - low labor costs lose importance. It is clear that this phenomenon of the 21st century affects the Slovak market and will increase significantly in the future (Martinák, 2017).

According to the industry4UM survey conducted under the auspices of the Ministry of Economy of the SR, surveys for 2017 and 2018 were carried out.

In 2017, only 19% of Slovak companies implemented Industry 4.0. For comparison with 2018, Industry 4.0's industry share is growing. But businesses still do not have the organizational and staffing structure in place for innovative management and change implementation. The philosophy of transformation has already gradually penetrated corporate culture, and most consider transformation to be important. A smart industry action plan approved by the Government (Industry4 in the SR, 2018) will also be supported.

For better understanding, we have included people involved in research into intelligence. Here are some interviews that have been leaked at conferences in the area.

Artificial intelligence and intelligent systems are dealt with by prof. Ing. Mária Bieliková, PhD, who is a Dean of the Faculty of Informatics and Information Technology and is also a member of the expert group called High-Level Group on Artificial Intelligence.

In her opinion: "The development of society and industry in Slovakia shows that specialization in the field of artificial intelligence and broader informatics is a good way for our country as it is a sector with high added value. In the first place, however, a clear signal should be given to young people that they have the prospect of gaining good quality education in Slovakia and the fact that Slovakia is going not only through the use of knowledge, but also through the creation and transfer to practice in this important area. But if other countries that have already begun their activities in this area - especially by building centers for artificial intelligence - attract our talents, it will be difficult to make use of any of my activity in this area"(Settey, 2018).

Another specialist who deals with artificial intelligence is Mgr. Marek Havrda, M.A., M.P.A., PhD., Who is GoodAI's economist, sociologist and strategic adviser. He added: "Today we are in a situation where existing algorithms are being refined. This means that machine learning, which includes neural networks, is constantly evolving. They are gradually being perfected and inspired by the human brain. "He added that the neural network in artificial intelligence is specific because it can be trained and, in particular, it is similar to man. The neural network can predict future developments based on the data previously provided. "The use of artificial intelligence has tremendous potential. Faster and more efficient production, less error rate and cheaper production, all of our artificial intelligence offers us "(Hrušovská, 2018).

The aim of the submitted contribution is also to provide an overview of salaries in the field of intelligence systems. Industry Leaders include the CEIT, which focuses on technical and process innovation, industrial automation, digital business technologies, design and material engineering. According to him, the service technician in Žilina earns from 950 € per month (gross), in Bratislava he has a starting salary of 1000 € (gross) plus remuneration according to performance. For comparison with the Czech Republic, the starting salary of the AGV service technician is 1200 € per month (gross), which is 200 € more than the Slovak Republic. Volkswagen Slovakia offers several jobs using artificial intelligence. Manufacturing engineer for bodywork, Vladimir Horny, has been working hand in hand with robots for six years now. Work in the bodywork compares to the legend, where one works together with the other when a car is created. His monthly salary is 1050 € per month (gross). We have met the employer of TS-Tec, s.r.o., which specializes in metal machining, metalworking, to compare wages in intelligent manufacturing conditions. The managing director provided us with basic information about salaries for his employees. Salaries are specified with respect to staff skills. The salary ranges from 700 – 2000 € depending on where you are employed and what it produces. Education is about a secondary school focused on engineering. The controlling officer was instructed by the adjusting mechanism.Special education is not required. Everything is about the experience, experience and skill of a person. This job requires a great deal of responsibility and is demanding for the job. When choosing a job, the supervisor places more emphasis on experience than on education.

4 Conclusion

From the point of view of employment and the level of payroll, automation does not affect the labor market equally. The labor market creates opportunities for employees with high qualifications and skills, leading to a substitution effect, replacement of medium-skilled labor with technology. According to forecasts, employment in highly qualified jobs will have an increasing trend in Slovakia over the next 10 years. These are mainly specialists, managers and professionals in various fields.

The aim of the article was to point out that intelligence systems in relation to wages are different from wages of a worker working manually, without the features of artificial intelligence. Many scientists point to artificial intelligence as to a fact that affects our lives in the future, whether positive or negative. Anyway, some will improve lives, but also many people will lose their jobs because the worker replaces a machine controlled by artificial intelligence. However, in order to be able to control the machines we need the human skills and endurance, and therefore we want to point out that the workers who work and work in this field are paying a much higher salary. They need some education, skills, and skills that they need to be able to control the machines.

As a result of globalization and technological change, individual states are forced to adapt their economy by modernizing their industry and using technological advances to ensure competitive business capabilities. In the world, we can see that some states, Denmark, France, the US, the United Kingdom, or China have adapted their intelligent manufacturing economy to deliverable results.

The introduction of the digitization measures is Germany's largest innovator. As the European Union is not lagging behind this trend, the Slovak industry is forced to respond to change as it would negatively affect the whole economy.

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