

SMALL AND MEDIUM-SIZED ENTERPRISES IN THE LABOR MARKET IN THE CONTEXT OF INDUSTRY 4.0

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Abstract: *Micro, small and medium enterprises are currently implementing new technologies and are introducing automation in industry, agriculture, construction and other sectors of the economy. Businesses are applying new technologies to their processes in order to increase their competitiveness in the market as well as to use resources more efficiently. In the context of Industry 4 development, SMEs face several obstacles. Our contribution is focused on mapping and identifying these problems and obstacles of micro, small and medium enterprises in the conditions of the Slovak Republic when implementing new technologies in relation to the quality of human resources.*

Keywords: *small and medium enterprises, labour market, human resources, Industry 4.0, automation.*

1. INTRODUCTION

Small and medium-sized enterprises form one of the pillars of employment in the Slovak national economy and are therefore an important part of the Slovak economy. They represent a group of companies that cannot be ignored. They account for 99.9% of all enterprises in the Slovak Republic and their share in employment in the SR is 72% (Table 3). Small and medium-sized enterprises play an irreplaceable role, particularly in the area of job creation, the introduction of innovations in economic practice and, in particular, contribute to the balancing of regional development disparities. Small and medium-sized enterprises are characterized by a strong specification, especially above all by the high degree of flexibility and the ability to adapt more quickly to changing market conditions, compared to large enterprises. But even with these facts, they are currently facing a major challenge in the form of Industry 4.0, which has significantly affected the structure of SMEs and the jobs they generate in recent years. The essence of the Fourth Industrial Revolution is to replace manual human labor with robotization, automation. Industry 4.0. can thus be characterized as gradual, fluent changes in technology. It is a logical evolution that creates a new production concept in all businesses, regardless of their size. It is a process that aims to launch a demand for new and modern technologies that accelerate the development of robotics and modern fully automated control systems that are independent of human operators. The essence of the processes is to ensure faster and more efficient production of more accurate, special, reliable and, in particular, cheaper products with an emphasis on better use of material inputs, time, recycling, utilization of renewable resources and ecology.

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When processing the paper, the basic source of information was data obtained from the database of the Statistical Office of the SR, Eurostat and the Slovak Business Agency. Important sources of information were also reports and reviews of major Slovak and European institutions as the Business Alliance of Slovakia. Slovak Business Agency, European Commission reports. Standard scientific methods of investigation were used to process the paper. The contribution is based on the EU definition of small and medium-sized enterprises (table 1).

Table 1: Definition of SME

Source: http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_en

SME Definition				
Enterprise category	Ceilings			
	Staff Headcount (number of persons expressed in annual work units)	Turnover	Or	Balance sheet total
Medium-sized	< 250	≤ € 50 million		≤ € 43 million
Small	< 50	≤ € 10 million		≤ € 10 million
Micro	< 10	≤ € 2 million		≤ € 2 million

2. SMALL AND MEDIUM-SIZED ENTERPRISES IN THE LABOR MARKET AND INDUSTRY 4.0 IN THE SLOVAK REPUBLIC

The development of employment and unemployment in the economy is not only a consequence of the causes and factors that operate in the market economy in a given year, but are mainly the result of a wide range of factors from the previous period. These factors affect the economic development of the economy in the future and thus the development of employment and unemployment. At present, the 4th industrial revolution, which substantially changes the structure of the labor market, has a significant impact on the labor market.

Table 2: Development of Employment and Unemployment Rate in Slovakia from 2008 to 2018

Source: own processing based on data from the Statistical Office of the Slovak Republic

year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
employment rate (%)	68,8	66,4	64,6	65	65,1	65	65,9	67,7	69,8	71,1	77,4
unemployment rate (%)	9,5	12,0	14,4	13,6	14,0	14,2	13,2	11,5	9,7	8,1	6,6

In the Slovak Republic, we have seen positive developments in employment in recent years and, in particular, a significant decline in unemployment (Table 2). The growth in employment and the decline in the unemployment rate have increased:

- state support for job creation,
- the inflow of foreign investment through which jobs have been created in industry and services,
- political stability, which had an impact on the stability of the Slovak economy,
- business growth.

Within the Slovak Republic, the largest share of jobs created is in services and industry. The smallest share of the employed is in the agricultural sector (table 3).

Table 3: Employment rate by economic activity
in the Slovak Republic in 2017 expressed as a percentage

Source: own processing based on data from the Statistical Office of the Slovak Republic

	agriculture	industry	construction	the shop	service
employment rate in%	3,21 %	27,02 %	9,65 %	11,64 %	48,48 %

In particular, small and medium-sized enterprises account for a large share of the positive development of employment in the Slovak economy, accounting for up to 72% of total employment. Even micro-enterprises make up 41.9% of all jobs. Thus, they play an important role in employment in the Slovak Republic. Slovak SMEs employ 2.6 people on average, lower than the EU average of 3.9.

Table 4: Number of enterprises, number of persons employed in SMEs broken down by number of employees in Slovakia and EU-28 in 2017

Source: SBA Fact Sheet Slovakia, 2018.

Size categories	Number of enterprises			Number of persons employed		
	Slovakia		EU -28	Slovakia		EU-28
	count	part	part	count	part	part
microenterprise (0-9)	550 016	96,9%	93,1%	647 209	41,9%	29,4%
small businesses (10- 49)	14 159	2,5%	5,8%	229 766	14,9%	20,0%
medium-sized enterprises (50- 249)	2 956	0,5%	0,9%	235 023	15,2%	17,0%
SMEs	567 131	99,9 %	99,08%	1 111 998	72,0%	66,4%

The biggest sectors for SMEs in Slovakia are industry and services. Together, both sectors contribute around half of total SME value added and half of total SME employment (figure 1).

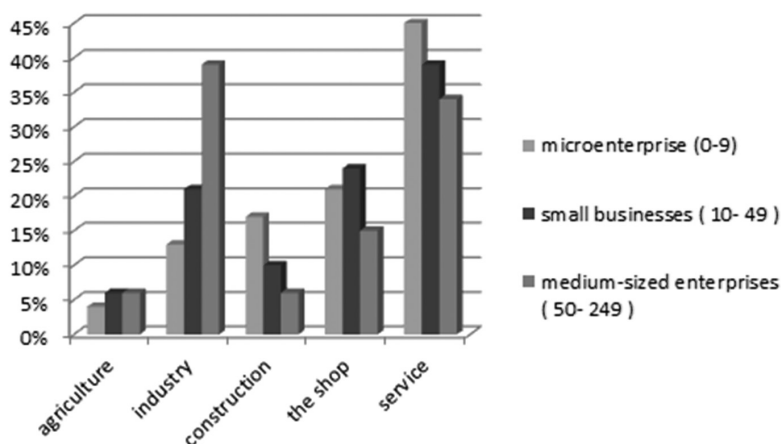


Figure 1: Sectoral structure of SMEs in Slovakia
by size categories and adjusted SK NACE classification in 2017
Source: <http://www.sbagency.sk/stav-maleho-a-stredneho-podnikania>

Ongoing dynamic changes associated with Industry 4.0 in economies largely affect the existence of small and medium-sized enterprises, but especially micro-enterprises. The issue of digitization, robotics, automation and technological innovations has a significant impact on the functioning of businesses that employ less than 10 employees. Official statistics of the Slovak Republic state that such business entities in Slovakia are 96.9%. It is a high proportion of businesses that are directly threatened by Industry 4.0 processes.

Under the influence of the Fourth Industrial Revolution, there will be changes in the labor market. The types of occupations and their structure will change. There will be a shift in qualifications in the labor market. And that is what the industry's biggest pitfalls of Industry 4.0 are seen in lack of skilled labor. Already today, the Slovak labor market has experienced a significant shortage of highly skilled labor for several years. The Slovak labor market currently lacks highly qualified, qualified and low-skilled workers in production and services.

Future business workers will no longer perform heavy manual work, but will oversee the equipment. They will change their job, and certainly a more comfortable working environment [6]. This means that the workforce will need to be reoriented to new types of employment, after which demand will be increased. In the long run, it can be expected that about a fifth of employees will change their jobs outside the area they have originally taught and learned. New job opportunities from automation will require employees with new skills and capabilities they do not currently have. Maxwell [7] explored what skills and qualifications employees should have in future businesses. Maxwell divided them into technical and personal. He further divided them into importance, namely those that employees must have, should have and could have (table 5). Consequently, the improvement of staff qualifications is important and necessary.

Table 5: Qualifications and skills of workers in a factory of the future
Source: https://m.vdi.eu/fileadmin/vdi_de/redakteur/karriere_bilder/VDI-ASME__2015__White_Paper_final.pdf,

		Must...	Should...	Could...
		<i>...be included in the skillset of the skilled labor of the future.</i>		
Technical Q&S	IT knowledge and abilities		Knowledge Management	Computer programming/coding abilities
	Data and information processing and analytics		Interdisciplinary / generic knowledge about technologies and organizations	Specialized knowledge about technologies
	Statistical knowledge		Specialized knowledge of manufacturing activities and processes	Awareness for ergonomics
	Organizational and processual understanding		Awareness for IT security and data protection	Understanding of legal affairs
	Ability to interact with modern interfaces (human-machine / human-robot)			
Personal Q&S	Self- and time management		Trust in new technologies	
	Adaptability and ability to change		Mindset for continuous improvement and lifelong learning	
	Team working abilities			
	Social skills			
	Communication skills			

Since Industry 4.0 is an irreversible process, it is necessary to respond to the situation and prepare people for the job market for new jobs that will require creative, technical, professional and analytical skills from people. The labor market will also require people with a high degree of learning who will have to be able to learn continually to stay busy. Especially less skilled people and people with low digital skills will be at risk in the future labor market. Professions are at risk, and at present, education without GCSE and vocational training, consisting of routine

activities, is sufficient. Many jobs are already replaceable by new technologies today, but due to the high mismatch between labor costs and automation costs, these jobs, especially in SMEs, continue to exist. Replacing people with technology is not going to be bursting, but it will also take place gradually in individual micro, small and medium-sized enterprises as long as they want to remain competitive. Digitization and robotics are irreversible and unstoppable processes in the economy that bring both positive and negative effects.

Industry 4.0 benefits for SMEs and the labor market:

- increased competitiveness,
- cost reduction, low stock levels,
- reduce production time,
- flexible responses to demand fluctuations,
- process optimization,
- increasing the use of renewable resources,
- improving quality,
- simplify order processing,
- reducing waste and waste in production,
- digitizing paper documents,
- real-time monitoring,
- better working conditions,
- better communication options,
- creation of new job positions,
- promoting talent and developing creativity,
- developing digitization skills and competences.

Risks of Industry 4.0 for SMEs and the labor market:

- risks associated with terrorism, hacker attacks,
- data security, protection of sensitive information,
- virus protection,
- loss of high-paid jobs,
- systematic lack of experience,
- extinction of professions,
- increasing the unemployment of people with low digital skills,
- lack of specialists.

3. CONCLUSION

Micro, small and medium-sized enterprises have an irreplaceable position in the economy in terms of job creation. Against this background, all aspects of the impact of Industry 4.0 on SMEs and job creation need to be considered and evaluated. It is already clear that digitization and automation will put an end to the jobs that SMEs have created because they will replace people's jobs. But even so, they will have a significant position in the economy in terms of job creation and the creation of innovative ideas in the fourth industrial revolution. Paradoxically, the process of digitization and robotics, which will create new jobs, will also contribute to this. Nevertheless, it is assumed that new jobs will be created more slowly than disappear. Thus, twice as many jobs cease to exist over time. These phenomena will also significantly affect the labor market situation. In particular, Industry 4.0 will need people with technical education, analytical skills, creative and other skills.

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