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Faculty of Social and Economic Relations
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Obsah   Contents

SELECTED ATTRIBUTES OF LONG-TERM SUSTAINABILITY OF HUMAN RESOURCE MANAGEMENT IN THE MSP IN THE VISEGRAD GROUP COUNTRIES. A SECTORAL PERSPECTIVE

Jaroslav BELÁS jr., Martin ŠRÁMKA, Zdenko METZKER, Kristína KOZOVÁ

Abstract

Human resource management in the SME segment is a complex process that involves many different factors. The aim of this study is to define the significant attributes of HRM in SMEs and compare attitudes within the three most significant business sectors in the individual Visegrad Group (V4) countries. Empirical research focused on the attitudes of small and medium-sized enterprises was conducted in June 2022 in the V4 countries. Data collection was carried out by the external agency MNFORCE using the Computer Assisted Web Interviewing (CAWI) research method. Within this research, selected attitudes of SMEs in the field of human resource management in the three most important sectors within the individual V4 countries were examined. The sample size was represented by 995 respondents. Statistical hypotheses were tested using descriptive statistics and Z-scores at a significance level of $\alpha = 5\%$. A positive finding is that within the examined sample, SMEs consider people in the company to be the most important capital and perceive human resource management positively in the context of corporate management. As a negative trend, the insufficient evaluation of employee performance by SMEs can be noted, and the level of investment in human capital is significantly limited. The most common differences in SME attitudes were found when comparing manufacturing companies with the service sector and the trade sector, which is determined by the peculiarities of the transformation process in these companies.

INTRODUCTION

Small and medium-sized enterprises (SMEs) represent a basic element of economic systems in the world. The dynamics of their development, their ability to innovate products and services, and their ability to quickly adapt to changing conditions are all essential for maintaining competitiveness.

Human resource management (HRM) represents a significant area of corporate management, as the human factor is extremely important in some business sectors. In the context of the strategic goals of SMEs, it is necessary for SME owners/managers to correctly perceive the importance of human capital, devote adequate management capacity to this area, be able to assess and motivate people in the company to achieve better results, and invest money into increasing their qualification growth.

SMEs in the countries of the Visegrád Four (V4) operate mainly in the area of services, trade, manufacturing, and tourism.

The originality and excellence of this study lies in the fact that we are studying the attitudes of SME owners/managers in the field of HRM on the basis of our own empirical research, which was carried out in the Visegrád Four countries (V4: Czech Republic, Slovakia, Poland, and Hungary). The research is focused on identifying differences within the most important business sectors of SMEs in these countries. The focus of attention is the question of to what extent different attitudes and approaches of SMEs to HRM exist in different business sectors.

The structure of the article is as follows. In the first chapter, scientific opinions on the given issue are presented. In the second chapter, the research objective is defined, the methodology used is described, and the data used in the article are described. In the next chapter, the research results and discussion of them are presented. In the conclusion, the basic research results are formulated in an integrated form.

LITERATURE REVIEW

Human resource management (HRM) has some specific characteristics in the environment of SMEs. The company is usually managed by an individual, often the owner of the company or a small group of people without significant specialization. Sometimes, HRM is pushed to the sidelines, even though people, their knowledge, professional skills, and motivation to achieve good results represent a significant source of success for SMEs. Therefore, a suitable approach to HRM in the SME segment represents a significant source of growth and competitiveness for these companies. This is also confirmed by Fejfarová (2016), who argues that HRM is a decisive factor that determines the success of small and medium-sized enterprises on the market, as well as their competitiveness.

The concept of human capital can be found in foreign and scientific literature. According to Alay and Jeppe (2013), human capital is a stock of knowledge and skills contained in the workforce, which is the result of education, work, and gives the workforce its corresponding value. Plaksiuk et al. (2023) refer to human capital as a factor that increases the effectiveness and competitiveness of an enterprise. Enterprises with employees who develop their knowledge and skills have higher growth and profitability than organizations in which employees lack these qualities (Gomezelj and Antonič, 2015). Irwin et al. (2018) refer to this quality as a competitive advantage for an enterprise.

In this context, Atkinson et al. (2022) point out the different ways in which SMEs function. According to the authors, these companies lack HR specialists who should be the bearers of progressive HR approaches, and their role is replaced by owners/managers. The authors also emphasize the importance of strategic HR management in this segment (similar conclusions are formulated by Lee, 2021 in a wider context).

Research on employee engagement has shown that a properly set up HR system is positively correlated with employee engagement (Saks, 2022). According to the author, a system of careful HR procedures (job design, training and development, flexible working conditions, work-life balance, participation in decision-making, health and safety, career development, and health and wellness programs) results in employees' interest in their company and a higher level of their engagement. In this context, Alsafadi and Altahat (2022) add that the appropriate application of the HR system has a positive impact on improving employee performance as well as on their job satisfaction and its components (stability and enrichment of work). The relationship between HR policy and performance in small and medium-sized enterprises was also investigated by Al Qaydi and Aris (2021). Similarly, Sanchez et al. (2022) demonstrate, based on the results of a survey of 1,136 Spanish small and medium-sized enterprises, that effective HR policies have a positive impact on achieving better performance and results of the enterprise. Li and Rees (2020) examined the factors that influence and interact with each other in the context of the way HR is managed in small and medium-sized enterprises in China. Among the studied determinants, they included the size of the enterprise, sector and area of operation, the presence of an HR department, and the location of the organization.

Ongoing structural changes in economies and labor markets are also significant determinants of human resource management. Technological innovations,

demographic trends, and globalization are influencing the way companies approach the management of their employees. These changes can include new skill requirements, flexible working conditions, and an increasing focus on employee development and engagement, so that organizations can effectively respond to the dynamics of the labor market. Therefore, education and retraining of employees is becoming an important activity in the field of human resource management. Authors Chasovschi et al. (2021) addressed this current challenge in the context of small and medium-sized enterprises in Romania, Moldova, and Ukraine, pointing out that education of human resources must become a priority for this group of enterprises.

The service, trade, manufacturing, and tourism sectors are the basic categories of the economy, which include various types of activities and enterprises. The service, trade, manufacturing, and tourism sectors form the basic pillars of the economy, and each of them is characterized by unique characteristics. (Maliszewska et al., 2020). All of these sectors represent important economic activity that ensures the creation of income and profits for the economy. They provide jobs for a wide range of people and contribute to employment and the growth of the national economy. All of these sectors are equally affected by economic cycles, which can have an impact on their performance and profits. The service sector deals with the provision of non-material services, such as financial and banking services, healthcare and related components, or the education sector. The trade sector deals with the sale and distribution of physical goods, including retail and wholesale. The manufacturing sector focuses on the creation of physical products, with innovation and development being important aspects of this sector. The tourism sector deals with hospitality and the provision of experiences and services for tourists. (Chittithaworn et al., 2011).

For example, the service and trade sectors may be less seasonally affected than the manufacturing and tourism sectors, which often depend on holiday seasons and climatic conditions (Wahyuni & Sara, 2020). In terms of capital and investment, the manufacturing sector requires larger investments in manufacturing facilities and technologies, while the service and trade sectors may focus on investments in software and infrastructure (Khan et al., 2019).

Regulations also differ between sectors. The manufacturing sector may be subject to stricter regulatory requirements, for example in the area of environmental protection, while the service and trade sectors may be less regulated (Williamson et al., 2006).

Therefore, although these sectors have many common characteristics, their differences are clear in several aspects, from the character of the services provided to the influence of technologies and global factors. Their coexistence and mutual influence contribute to the diversity and dynamics of the modern economy. It is therefore possible to observe how the field of operation and the sectoral focus of companies influence different practices and policies in the field of human resource management.

This study is focused on the examination of the significant factors of HR in SMEs from the point of view of the three most important business sectors in each of the V4 countries.

GOAL AND METHODOLOGY

The aim of the article was to define the significant attributes of HR in SMEs and to compare attitudes within the three most important business sectors in each of the V4 countries.

Empirical research aimed at identifying the attitudes of SMEs was conducted in June 2022 in the V4 countries. Data collection was carried out by the external agency MNFORCE using the "Computer Assisted Web Interviewing" (CAWI Research Method). The questionnaire could be completed by the owner or top manager of a small or medium-

sized enterprise (SME; hereinafter referred to as the respondent).

In the Czech Republic, the total number of respondents was 347. The structure of respondents in terms of company size was as follows: 45.2% micro-enterprises, 30.8% small enterprises, and 23.9% medium enterprises. The majority of companies operated in the service sector, with 138 (39.8%), followed by manufacturing with 72 (20.7%), and then trade with 60 companies (17.3%).

In the Slovak Republic, the total number of respondents was 322. The structure of respondents in terms of company size was as follows: 51.9% micro-enterprises, 26.7% small enterprises, and 21.4% medium enterprises. The majority of companies operated in the service sector, with 129 (40.1%), followed by trade with 79 (24.5%), and manufacturing with 42 (13.0%).

In Poland, the total number of respondents was 381. The structure of respondents in terms of company size was as follows: 47.2% micro-enterprises, 27.8% small enterprises, and 25.0% medium enterprises. The majority of companies operated in the tourism sector, with 110 (28.9%), followed by manufacturing with 78 (20.5%), and then trade with 56 (14.7%).

In Hungary, the total number of respondents was 348. The structure of respondents in terms of company size was as follows: 50.0% micro-enterprises, 28.2% small enterprises, and 21.8% medium enterprises. The majority of companies operated in the tourism sector, with 110 (31.6%), followed by trade with 69 (19.8%), and services with 52 (14.9%).

In this article, we will evaluate the attitudes of respondents according to the three most important business sectors in each of the V4 countries. In the Czech Republic, these will be the following sectors of the economy: services, manufacturing, and trade. In Slovakia, services, trade, and manufacturing. In Poland, tourism, manufacturing, and trade. In Hungary, tourism, trade, and services.

Within the research, statements were established that appropriately characterize the importance of HR in the SME segment:

ST1: I consider people in the company to be the most important capital.
ST2: I consider human resources management to be the most important area of corporate management.
ST3: I regularly evaluate the performance of my subordinates and motivate them to innovate work processes.
ST4: I invest a lot of money in increasing the qualifications of our employees.

Within the research, the following statistical hypotheses were established:

H1: There are no statistically significant differences in the positive attitudes of SMEs according to the three most important sectors in each of the V4 countries when evaluating ST1.
H2: There are no statistically significant differences in the positive attitudes of SMEs according to the three most important sectors in each of the V4 countries when evaluating ST2.
H3: There are no statistically significant differences in the positive attitudes of SMEs according to the three most important sectors in each of the V4 countries when evaluating ST3.
H4: There are no statistically significant differences in the positive attitudes of SMEs according to the three most important sectors in each of the V4 countries when evaluating ST4.

The statistical hypotheses were tested using descriptive statistics and Z-score at the significance level $\alpha = 5\%$. If the p-value is higher than or equal to 0.05, the null hypothesis is confirmed. If the p-value is lower than 0.05, the null hypothesis is rejected. The calculations were made using freely available software on the internet (Z Score Calculator, 2023).

FINDINGS

The following tables present the research results, including the verification of the individual scientific hypotheses.

Tab. 1: Results of the ST1 research according to the most important sectors in each of the V4 countries

ST1: I consider people in the company to be the most important capital.	CR S/V/O 138/72/60	SR S/V/O 129/42/79	PL CR/V/O 110/78/56	HU CR/O/S 110/69/52
1. I totally agree	71/36/25	66/27/45	64/59/36	70/47/32
2. I agree	50/31/21	51/10/28	37/19/16	27/17/19
Total 1+2/ in %	121/67/46 88/93/77	117/37/73 91/88/92	101/78/52 92/100/93	97/64/51 88/93/98

Source: own calculations.

Note: Czech Republic – CR; Slovak Republic – SR; Poland - PL; Hungary – HU; services-S; shop-O; production-V; tourism-CR;

Tab. 2: Statistical calculations of ST1 according to the most important sectors in each of the V4 countries.

Z score: p-value:			
CR: S/V; S/O; **V/O**	0,226	0,050	**0,008**
SR: S/V; S/O; V/O	0,624	0,667	0,430
PL: **CR/V**; CR/O; **V/O**	**0,010**	0,810	**0,016**
HU: CR/O; **CR/S;** O/S	0,322	**0,037**	0,180

Source: own calculations.

H1 was not confirmed. We found that there are statistically significant differences in the positive responses of respondents to ST1 according to the individual sectors. In the Czech Republic, the manufacturing sector significantly agreed with the ST1 statement more than the trade sector (p-value = 0.008, the percentage ratio was 93% : 77%). In Poland, we found differences between tourism and manufacturing (p-value = 0.010, the percentage ratio was 92% : 100%) and between manufacturing and trade (p-value = 0.016, 100% : 93%). In Hungary, we see significant differences between tourism (88%) and services (only 52% of the respondents agreed).

Tab. 3: Results of the ST2 research according to the most important sectors in each of the V4 countries

ST2: I consider human resources management to be the most important area of corporate management.	CR S/V/O 138/72/60	SR S/V/O 129/42/79	PL CR/V/O 110/78/56	HU CR/O/S 110/69/52
1. I totally agree	40/24/13	42/18/29	36/44/26	45/21/22
2. I agree	64/39/32	71/20/43	58/30/19	45/40/27
Total 1+2/ in %	104/63/45 75/87/75	113/38/72 88/90/91	94/74/45 85/95/80	90/61/49 82/88/94

Source: own calculations

Tab.4: Statistical calculations of ST2 according to the most important sectors in each of the V4 countries.

Z score: p-value:			
CR: **S/V;** S/O; V/O	**0,038**	0,960	0,064
SR: S/V; S/O; V/O	0,617	0,429	0,904
PL: **CR/V;** CR/O; **V/O**	**0,039**	0,401	**0,008**
HU: CR/O; **CR/S;** O/S	0,238	**0,035**	0,271

Source: own calculations

H2 was not confirmed. We found that there are statistically significant differences in the positive responses of respondents to ST2 according to the individual sectors. In the Czech Republic, the manufacturing sector significantly agreed with the ST2 statement more than the services sector (p-value = 0.038). In Poland, we found differences between tourism and manufacturing (p-value = 0.039) and between manufacturing and trade (p-value = 0.008). In Hungary, we see significant differences between tourism and services (p-value = 0.035).

Tab. 5: Results of the ST3 research according to the most important sectors in each of the V4 countries

ST3: I regularly evaluate the performance of my subordinates and motivate them to innovate work processes.	CR S/V/O 138/72/60	SR S/V/O 129/42/79	PL CR/V/O 110/78/56	HU CR/O/S 110/69/52
1. I totally agree	43/30/19	41/16/33	32/41/23	54/37/30
2. I agree	54/33/27	56/21/32	53/25/23	40/24/18
Total 1+2/	97/63/46	97/37/65	85/66/46	94/61/48
in %	70/87/77	72/88/82	77/85/82	85/88/92

Source: own calculations

Tab. 6: Statistical calculations of ST3 according to the most important sectors in each of the V4 countries

Z score: p-value:			
CR: **S/V;** S/O; V/O	**0,005**	0,357	0,103
SR: S/V; S/O; V/O	0,078	0,234	0,401
PL: CR/V; CR/O; V/O	0,211	0,465	0,704
HU: CR/O; CR/S; O/S	0,575	0,215	0,478

Source: own calculations

H3 was basically confirmed. We found that there is only one statistically significant difference in the positive responses of respondents to ST3 in the Czech Republic, namely between services and manufacturing. No differences were found in the remaining V4 countries.

Tab. 7: Results of the ST4 research according to the most important sectors in each of the V4 countries

ST4: I invest a lot of money in increasing the qualifications of our employees.	CR S/V/O 138/72/60	SR S/V/O 129/42/79	PL CR/V/O 110/78/56	HU CR/O/S 110/69/52
1. I totally agree	21/21/9	28/10/20	37/36/31	36/30/22
2. I agree	52/34/24	51/15/34	43/30/12	44/29/19
Total 1+2/	73/55/33	79/25/54	80/66/43	80/59/41
in %	53/76/55	61/59/68	73/85/77	73/85./79

Source: own calculations.

Tab. 8: Statistical calculations of ST4 according to the most important sectors in each of the V4 countries.

Z score: p-value:			
CR: **S/V;** S/O; **V/O**	**0,001**	0,787	**0,009**
SR: S/V; S/O; V/O	0,841	0,298	0,332
PL: CR/V; CR/O; V/O	0,054	0,575	0,250
HU: **CR/O;** CR/S; O/S	**0,045**	0,401	0,337

Source: own calculations.

H4 was not confirmed. We found that there are statistically significant differences in the positive responses of respondents to ST4 according to the individual sectors. In the Czech Republic, the manufacturing sector significantly agreed with the ST4 statement more than the services and trade sectors. In Hungary, we see significant differences between tourism and trade.

The research results can be summarized in the following areas.

The most common differences in responses are found when comparing SMEs operating in manufacturing to SMEs operating in services, trade, and tourism. These are followed by differences in the attitudes of SMEs operating in tourism compared to other sectors of the economy.

The average approval rate for ST1 in the V4 countries was as follows: 94% in manufacturing, followed by 92% in services, 90% in tourism, and 89% in trade. This means that the dominant part of SMEs in the defined sectors in the V4 countries consider people in the company to be the most important capital.

The average approval rate for ST2 in the V4 countries was as follows: 91% in manufacturing, followed by services (86%),

tourism (83%), and trade (83%). SMEs also have a relatively high approval rate for the statement that they consider human resources management to be the most important area of corporate management.

The average approval rate for ST3 in the V4 countries was as follows: 87% in manufacturing, followed by trade (82%), tourism (81%), and services (78%). These results are not very positive, as there is a significant number of SMEs that do not regularly evaluate the performance of their subordinates and do not motivate them to innovate work processes.

The average approval rate for ST4 in the V4 countries was as follows: 73% in manufacturing and tourism, followed by trade (71%) and services (64%). It is clear that this is the area where we see the least positive attitudes of SMEs in the evaluated set. It can be assumed that the level of investment in human capital is significantly limited in the context of SMEs.

The results of this research support the conclusions of the studies by Alay and Jeppe (2013), Gomezelj and Antonič (2015), and Irwin et al. (2018), which emphasize the significance of human capital and its impact

on the economic growth, profitability, and competitive advantage of a company.

At the same time, our results confirm and complement the findings of the study by Atkinson et al. (2022), who highlight different modes of functioning of HRM in the SME segment. According to the authors, a major issue for SMEs is the lack of personnel specialists in companies, or the absence of strategic perspectives on HRM issues (Lee, 2021).

The results of the research point to the importance of the findings by Saks (2022) and Alsafadi and Altahat (2022), which focus on the issue of the proper setting of the HR system in the context of improving employee performance.

CONCLUSION

Human resource management in the SME segment is a complex process involving various factors. SMEs should carefully consider these aspects and integrate them into their strategy and activities to achieve optimal human capital performance for the preservation of competitiveness and long-term survival.

The aim of the article was to define the significant attributes of HR in SMEs and to compare attitudes within the three most important business sectors in each of the V4 countries.

Within the research, we defined four statements that appropriately define the HRM domain in the SME segment.

The fundamental findings of the empirical research can be formulated as follows. A positive finding is that, within the examined sample, SMEs consider people as the most important capital in the company and have a positive approach to human resource management in the context of corporate management. As a negative trend, the insufficient evaluation of employee performance by SMEs can be noted, and the level of investment in human capital is significantly limited.

The most common differences in SME attitudes were found when comparing manufacturing companies with the service sector and the trade sector, which is determined by the specifics of the transformation process in these companies and the importance of the human factor in technological processes.

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EMPLOYMENT DEVELOPMENT IN THE CONTEXT OF AGENDA 2030

Eva GRMANOVÁ

Abstract

The aim of our scientific study was to identify and assess the specificities of the EU countries in the field of employment improvement based on the indicators "young people neither in employment nor in education and training" (NEET) and "employment rate" within the EU and to evaluate the position of the Slovak Republic. The selected indicators are determined in Agenda 2030 in the area of "Decent work and economic growth" as indicators with quantitative targets. In the scientific study, the method of analysis of the development of time series and linear regression analysis is used. We can say that the development in the Slovak Republic is favourable.   However, the values of both indicators are worse than the average values in the EU. The linear regression points to a strong connection between indicators. From the derived relations, the possibilities for improvement also follow.

INTRODUCTION

All the developed countries of the world are currently engaged in a sustainable development strategy. Sustainable development is seen as a necessity and an important competitive advantage towards prosperity. It is important to ensure sustainable development in the economic, social, environmental and institutional spheres. In the economic sphere, the focus is on developing the economic potential of the country, mainly on economic growth and increasing competitiveness. In the social sphere, the focus is on human resources and improving their quality. In the environmental sphere, the focus is on the protection of the country's natural resources and natural potential. In the institutional sphere, it addresses the quality of local and regional governments and the quality of their institutions (Huttmanová, 2011).

The sustainable development strategy is formulated in Agenda 2030, which is the 2030 agenda for sustainable development. Its implementation will lead to progress and convergence of national economies. It will reduce regional disparities at national levels and accelerate change. "The key principles of the 2030 Agenda, as set out in the document endorsed by the UN General Assembly in September 2015 - "Transforming our world: the 2030 Agenda for Sustainable Development "1 , are transformation, integration and universality (Kubišová, 2021). The 2030 Agenda contains 17 sustainable development goals focusing on three areas - economic, social and environmental. These goals thus address the most important challenges of today, with a focus on enhancing progress in the future. The Sustainable Development Agenda has an important place in setting national priorities and their implementation. It therefore becomes important to monitor and assess progress towards each goal at European and national levels (Statistical Office of the Slovak Republic, 2023).

Sustainable progress under the 2030 Agenda is tracked under goal 8 "Decent work and economic growth" on the basis of I. sustainable economic growth, II. employment, III. decent work. In our scientific study, we will assess the development of the SR and evaluate progress towards the employment goals. We will focus on indicators with quantitative goals. There are two indicators set: "young people neither in employment nor in education and training" (NEET) and „employment rate".   For these indicators, thresholds are set for countries to achieve by 2030. For the indicator "NEET of population aged 15 to 29", the value that needs to be achieved has been set to less than or equal

to 9%. Thus, the threshold set is 9%. For the indicator "employment rate of population aged 20 to 64", the value that needs to be achieved has been set to greater than or equal to 78% (Eurostat, 2, 2023).

States currently vary considerably in the values of these indicators. Hence, they have to exert varying degrees of effort to achieve the set thresholds.

Various concepts are applied to achieve the goals. One of the best known concepts is the concept of smart regions. Its main idea is the use of digital information and communication technologies to raise the standard of living in the regions. One of the aspects of the smart approach is the support of innovations and the creation of new jobs with the aim of increasing employment (Pauhofová, Staněk, Stehlíková, 2019).

LITERATURE OVERVIEW

Sustainable development is understood as development that takes into account and respects present needs without limiting future generations (Dubravská, 2017). This means that it not only focuses on the short term, but also takes into account the needs in different areas of the next generations in the long term.

Sustainable development of a country is only possible with the development of human resources. Increasing employment is considered as one of the most important pillars of human resource development. It has an impact on poverty eradication and reduction of social and regional inequalities (Lee, Christianson, Bietsch, 2016). On the contrary, when unemployment increases, social exclusion as well as poverty and misery increase. Ultimately, employment and unemployment affect a country's economic development and its competitiveness.

Employment is affected by several factors. The current population trend, where the share of people of post-working age is decreasing and there is a shortage of labour in the labour market, has a positive impact on increasing employment. However, it is not the only way to achieve the desired employment rates. Sophisticated and complex job creation is becoming an important political and economic objective.

In terms of unemployment, there are significant differences depending on age. Young people are among the most vulnerable groups. The importance of employment of young people is important from a number of perspectives and can be understood broadly. It is not only linked to the economic sphere, but also affects the social and migration spheres. Unemployment of young people directly increases the risk of social dissatisfaction (Escudero, Mourelo, 2014). Young people, in particular, lose their work habits and interest in looking for a job very quickly. Unemployment of young people has an impact on long-term social exclusion in old age and increases the risk of poverty. In the long term, this is particularly the case for men (Bäckman, Nilsson, 2016). The negative consequence can then be that young people leave both the labour market and their home country.

The values of the indicator "young people neither in employment nor in education and training" are sensitive to negative changes in the environment. Some authors point to the fact that during the COVID 19 pandemic the values of this indicator deteriorated. The most affected were young people after college in the age group of 25 to 34 years (Aina, Brunet, Mussida, Scicchitano, 2021).

There are several reasons why young people are neither in education nor in work. Some authors point to the fact that the high share of "young people neither in employment nor in education and training" may not indicate a lack of interest among young people in employment but is a consequence of young people not being able to find work in the long term (Mudiriza, Lannoy, 2023). One reason for this may be that employers often demand work experience that young people do not have. This may also be one of the reasons why countries with a higher share of students working alongside their studies have lower values of the indicator "young people neither in employment nor in education and training". Engaging young people in the labour market while they are still studying and linking education to work experience appears to be an important tool for reducing the values of this indicator.

Creating job opportunities for young people also appears to be important. Equally important is to make young people's opportunities for entrepreneurship (Esha, 2020) more functional and systematic. Such an approach can benefit

from the creativity of young people. However, some authors take a different view. They point out that promoting entrepreneurship as a development strategy has not proven successful. It is the policy strategies favouring such approaches that should be one of the most important (Cieslik, Barford, Vira, 2022).

In monitoring the results so far in meeting the goals set out in Agenda 2030, some authors draw attention to large regional disparities. In the area of sustainability, the Nordic countries perform best in the economic and social spheres. Their past development has been favourable over the long term and they therefore perform positively on most economic and social indicators. In contrast, the countries of Eastern Europe and those that joined the EU after 2004 are largely lagging behind the others, especially in the economic and social areas. (Ricciolini, Tiralti, Paolotti,Rocchi, Boggia, 2023). They need to make much greater efforts to achieve the set goals.

At the same time, it is necessary that these countries make more intensive use of information and communication technologies, which is an important aspect of the Smart approach. It also includes more effective investment in the development of human and social capital (SBA, 2021).

GOAL AND METHODOLOGY

Our scientific study focuses on the assessment of "young people neither in employment nor in education and training" (NEET) and "employment rate" in the Slovak Republic within the EU. The aim of our scientific study is to identify and assess the specificities of the EU countries in the field of employment improvement based on the indicators "young people neither in employment nor in education and training" and "employment rate" within the EU and to evaluate the position of the Slovak Republic. The selected indicators are determined in Agenda 2030 in the area of "Decent work and economic growth" as indicators with quantitative targets.

The following research questions are projected:
1/ What is the development of the indicator "young people neither in employment nor in education and training" in the SR within the EU?

2/ What is the development of the indicator "employment rate" in the SR within the EU?
3/ What is the relationship between the values of both indicators in the SR?

In addition to analysing the status quo, we also look at the dynamics of change. For the analysis of the time series development we use the coefficient of growth (decline). The average growth (decline) coefficient is expressed by the geometric mean according to equation (1)

$$\bar{k} = \sqrt[T-1]{k_2 k_3 \dots k_T} = \sqrt[T-1]{\frac{y_2}{y_1}\frac{y_3}{y_2}\dots\frac{y_T}{y_{T-1}}} = \sqrt[T-1]{\frac{y_T}{y_1}}.$$

(1)   (Pacáková, 2003, 244)

y_i indicates the value of indicator in the ith analyzed period.

The period analysed is the years 2004 to 2022. This period has been determined on the basis of data availability. The data source was the Eurostat database. The data were analysed using Microsoft Excel and Gretl.

An important step to find out the correlations between the two variables is to determine the regression relationship. We used the OLS method to express the linear relationship between the two variables.
The shape of the model was:
$$v_{2t} = f(v_{1t}) + \epsilon_t$$
(2)
where ϵ_t represents the random component - the component of residuals and applies $\epsilon_t \sim N(0, \sigma_0^2)$

The functional relationship was:
$$v_{2t} = \beta_0 + \beta_1 v_{1t}, t = 1, 2, \dots, T,$$
(3)

We verified the statistical significance of the parameters and the model.
Null hypothesis -   1H0: the parameter is not statistically significant.
Alternative hypothesis - 1H1: the parameter is statistically significant.

Null hypothesis -   2H0: the model is not statistically significant.
Alternative hypothesis - 2H1: the model is statistically significant.
We used the t-test to verify the statistical significance of the parameters. We used the F

test to test the statistical significance of the model (Adamec, Střelec, Hampel, 2017).

To evaluate the model, we expressed the statistical measure - coefficient of determination (R-squared). R-squared shows the proportion of variation in a dependent variable explained by an independent variable.

We verified the normality of the residuals and determined whether autocorrelation does not occur.

Null hypothesis - 3H0: error is normally distributed.
Alternative hypothesis - 3H1: error is not normally distributed.
(Adamec, Střelec, 2020).

Null hypothesis - 4H0: first-order autocorrelation does not occur (no autocorrelation).
Alternative hypothesis - 4H1: first-order autocorrelation does occur.

Since these are time series, it is important to check whether the time series are stationary. In case of non-stationarity of time series, their cointegration is important. If the non-stationary time series are not cointegrated, it can occur spurious regression (Arlt, 1997).

We used the ADF test to verify stationarity. This is a test whose null hypothesis speaks of non-stationarity in the form of unit root(s) (Výrost, Baumöhl, Lyócsa, 2013, 262).

FINDINGS

1.   Evaluation of the status and the development of selected indicators

1.1 Young people neither in employment nor in education and training

In 2004, NEET values were published for 24 states. Unpublished data concerned Malta, Croatia and Italy. Six states had NEET values less than 9%, namely Denmark, Luxembourg, Netherland, Austria, Slovenia and Sweden. The lowest value was for Luxembourg (5.4%). Bulgaria had the highest value with 28.7%. The EU average was 13.48%. Slovakia had the third highest value - 21.2% (Fig. 1). The high share of "young people neither in employment nor in education and training" is one of the weaknesses of Slovakia.

Fig.1: Young people neither in employment nor in education and training NEET in the year 2004
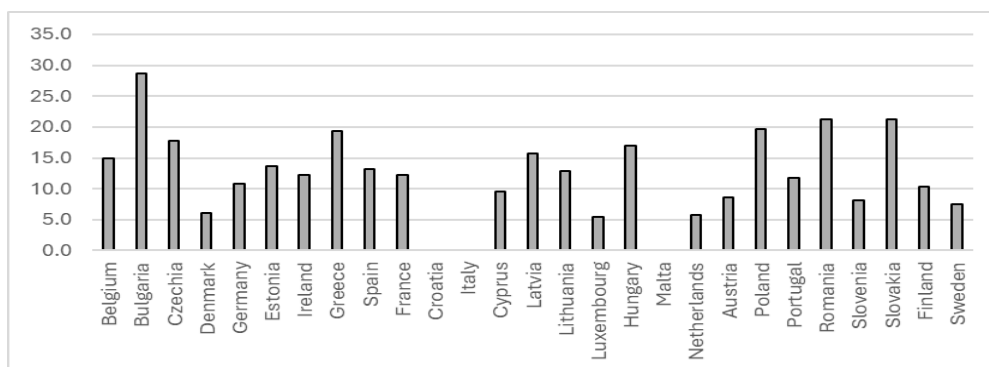
Source: Eurostat. (1, 2023)

By 2022, the value of the NEET indicator decreased significantly in most EU countries. 11 countries already had a value of less than 9% (Fig. 2). The Netherlands had the lowest value - 4%. The value of the indicator in Slovakia had decreased to 58% since the beginning of the period analysed (Fig. 3) and reached a value of 12.3%. The average decline coefficient expressed by the geometric mean was 2.98%. The decrease in the value of the indicator for Slovakia was significant. Thus, Slovakia is among the EU countries in which the value of the indicator is above the threshold of 9% at the beginning as well as at the end of the period analysed, but a significant decrease in the indicator values has been recorded. The

Netherlands and Sweden can be considered as the best performing countries. In both years they had values of the indicator below 9% and their values decreased significantly over the period analysed.

Fig.2: Young people neither in employment nor in education and training NEET in the year 2023
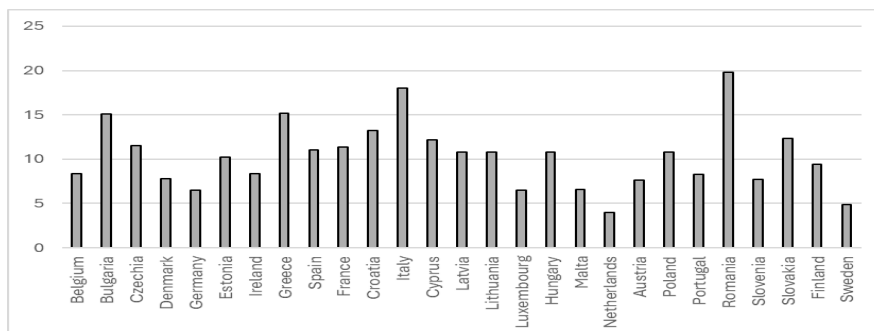
Source: Eurostat. (1, 2023)

The unfavourable development occurred in Cyprus. The indicator values were above 9% at the beginning as well as at the end of the period and increased significantly.

In summary, we can say that the development of the NEET indicator in the Slovak Republic is favourable. However, in terms of the EU, the value of the NEET indicator is still above the EU average and is the seventh highest (Fig. 2). It is important that the positive trend of decreasing values of the indicator in the Slovak Republic continues in the following period.

Fig.3: Coefficient of growth (NEET)
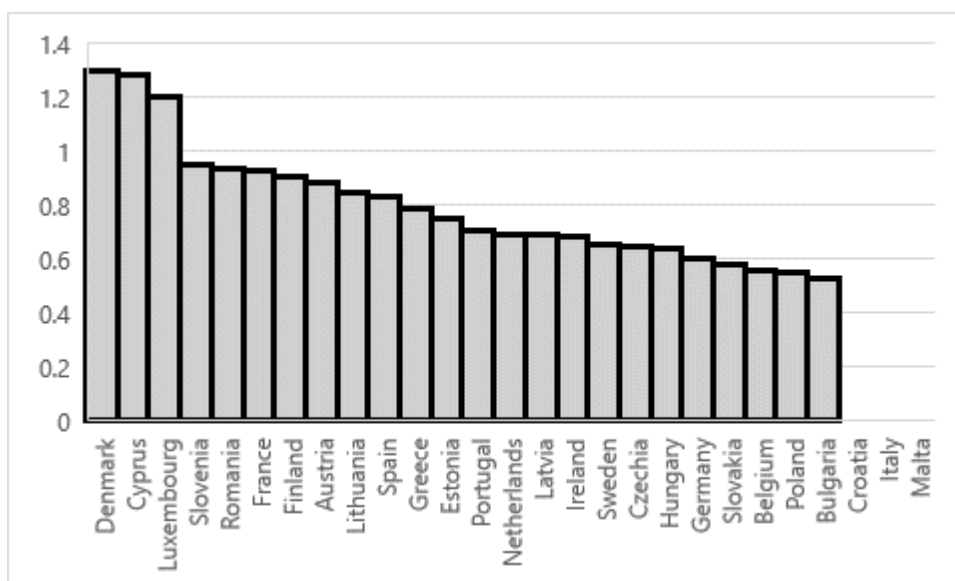
Source: Eurostat. (1, 2023)

1.2 Employment rate

In 2004, "employment rate" values were published for 24 countries. Data were not published for Croatia, Italy and Malta. Only Denmark and Sweden had employment rates greater than 78%. Denmark had the highest value - 79.9%. Poland had the lowest value - 57%. The EU average was 68.9%. Slovakia was well below the EU average with a value of 63.5% (Fig. 4). The below-average value of the employment rate is one of the weaknesses of the Slovak Republic.

Fig.4: Employment rate in the year 2004
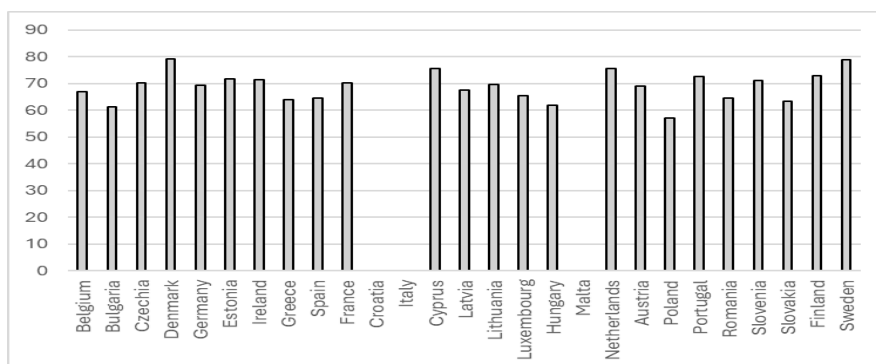
Source: Eurostat. (3, 2023)

By 2022, the value of the employment rate increased significantly in all EU countries (Fig. 5). By the end of the period analysed, 12 countries already had a value greater than or equal to 78%. Sweden had the highest value 83.8%. The value of the indicator in Slovakia had increased to 120.79% since the beginning of the period analysed (Fig. 6) and reached the value of 76.7%. The average growth coefficient expressed by the geometric mean was 1.05%.

The value of the indicator in Slovakia was already at the level of the EU average. The increase in the value of the indicator within Slovakia was significant. It was the fourth highest increase in the value of the indicator within the EU. Nevertheless, Slovakia failed to reach the employment rate threshold of 78% by 2022. A significant increase occurred in Poland. The value of the indicator increased by up to 34.6% in the period analysed.

Fig.5: Employment rate in the year 2022
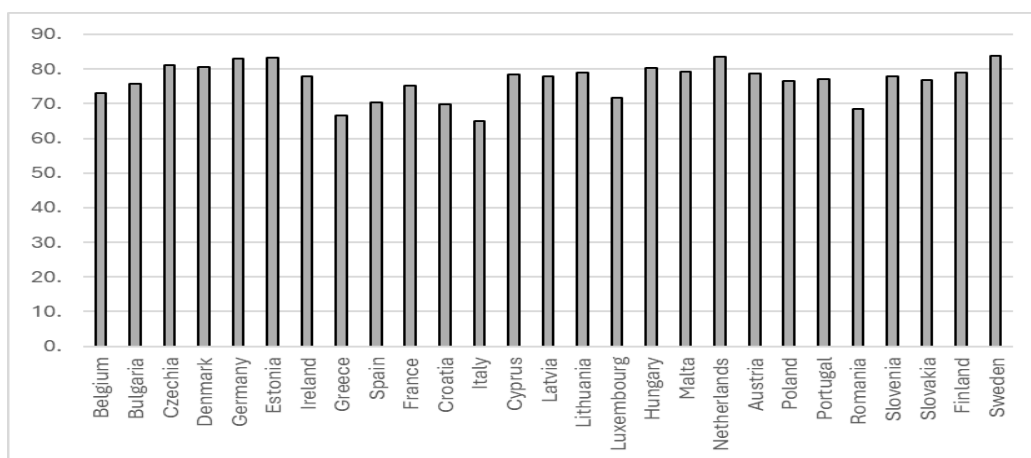
Source: Eurostat. (3, 2023)

In summary, we can say that the development in the Slovak Republic is favourable. However, in terms of the EU, the value of the indicator does not yet reach the required value. It is important that the positive trend of increasing employment rate values in the Slovak Republic continues in the following period.

Fig.6: Coefficient of growth (Employment rate)
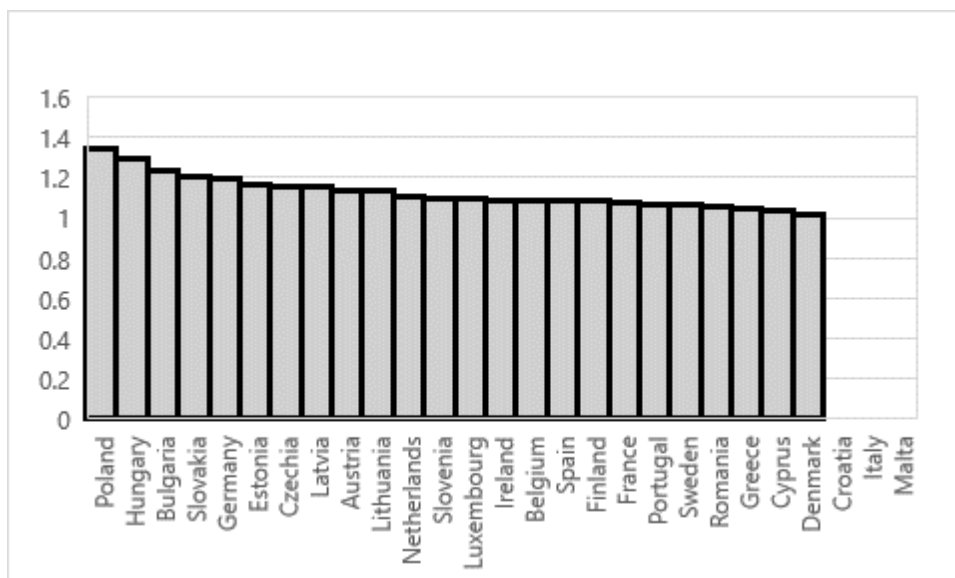
Source: Eurostat. (3, 2023)

2. Evaluation of the specifics of Slovakia

In order to assess the values of the indicators in the Slovak Republic, it is important to observe the regression relationship between the two variables analysed.

The dependent variable v_{2t} is NEET. The independent variable v_{1t} is the employment rate. Based on the OLS method, we can derive the functional relationship between the variables.

Since we are analysing the relationship between the values of two time series, we will first look at their stationarity. Based on the Unit root test in Gretl, we did not reject the null hypothesis that the time series are non-stationary. Thus, we did not accept the alternative hypothesis that the time series are stationary.

"One way to possibly avoid the problem of false regression is to transform non-stationary time series into stationary ones." (Výrost, Baumöhl, Lyócsa, 2013, 277). One possibility is to transform the variables using differential. "It is recommended to first take the logarithm of the values before differencing" (Výrost, Baumöhl, Lyócsa, 2013, 278).

Therefore, we assume the following functional relationship:

$$\mathrm{d}\ln v_{2t} = \beta_1 \; \mathrm{d}\ln v_{1t} + \beta_0, \quad t=1, 2, ..., T, \quad (4)$$

where *d* is first difference, *ln* is the logarithm of the value.

Fig.7: Linear regression
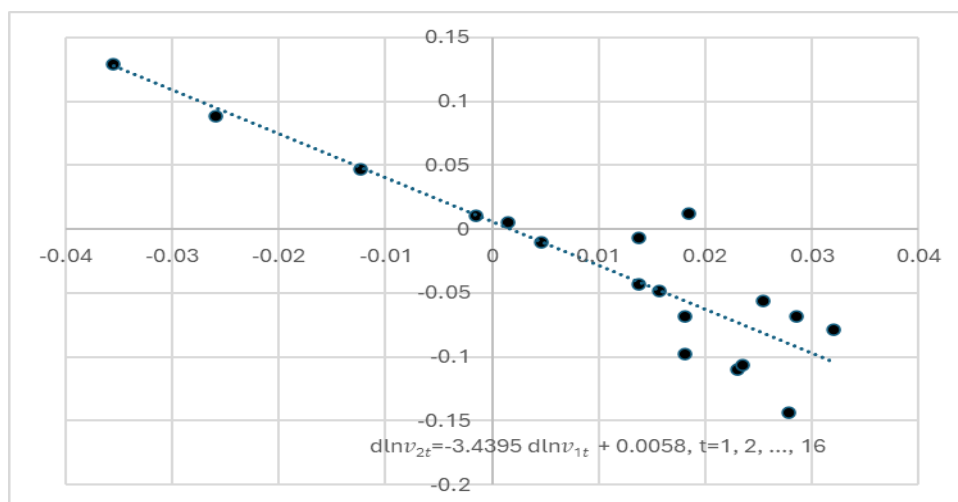
Source: own processing based on data from Eurostat (1, 3, 2023) in Microsoft Excel

Using the OLS method, we derived the following relationship:

$d\ln v_{2t} = -3.4395\ d\ln v_{1t} + 0.0058$, t=1, 2, ..., 18,

where d is first difference, *ln* is the logarithm of the value.

The linear dependence is indirect (Fig. 7). Based on the adjusted R-squared, we can conclude that 81.55% of the variability is explained by the model. Both the regression coefficient and the model are statistically significant (p less than 0.01).

We used the Chi-square test to verify the normality of the residuals. We did not reject the null hypothesis: error is normally distributed. We did not reject the null hypothesis: no autocorrelation based on the LM test for autocorrelation.

It follows from the previous analysis that if the current development is maintained and the average growth (decline) coefficient does not change, then it is realistic to reach the set limit of the employment rate. However, the cutoff for NEET would not be reached.

Expressing the parameters of linear regression is of practical importance. It points to a very strong connection between both indicators. The increase in the growth of the employment rate also resulted in a significant decrease in NEET.

This finding is important. It points to the need to find all the possibilities for a more significant increase in employment in the Slovak Republic. More intensive application of the concept of Smart approaches and the building of Smart regions is becoming a necessary. The above relationship implies the need for increasing employment growth. The SR should use all the means available to increase employment. This is the only way to ensure economic and social development.

DISCUSSION

It is necessary to constantly monitor the indicators used within the 2030 Agenda and, based on the ongoing results achieved, adjust the sub-goals during the analyzed period. Based on our analysis, we can agree with the evaluations of the Agenda 2030, in the report on the results achieved in the national priorities of the implementation of the Agenda 2030, which note the improvement of employment in the Slovak Republic (Ministry of Investments, Regional Development and Informatization of the Slovak Republic, 2020). For both analyzed indicators, the improvement of the Slovak Republic's position in the EU area was confirmed. At the same time, however, we want to draw attention to the need to increase the intensity of employment improvement, which results from

the current development. By intensifying the improvement of employment can it be possible to achieve both goals set in Agenda 2030.

CONCLUSION

The scientific study focuses on employment in the Slovak Republic from the point of view of the 2030 Agenda. It analyses the position of the Slovak Republic in the EU space and, based on current developments, it aims to evaluate the reality of achieving both quantitative goals of the indicators.

The aim of our scientific study was to identify and assess the specificities of the EU countries in the field of employment sustainability based on the indicators "young people neither in employment nor in education and training" and "employment rate" within the EU and to evaluate the position of the Slovak Republic.

Based on the analysis, we can summarize that the values of both indicators in the Slovak Republic were worse than the average values within the EU. So we can evaluate them as weak points of Slovakia. On the other hand, it should be noted that the trends of both indicators in Slovakia are favorable. Their value improved and approached the values of developed EU states.

The linear regression points to a very strong connection between indicators "young people neither in employment nor in education and training" and "employment rate". The increase in the growth of the employment rate also resulted in a significant decrease in NEET. Therefore, the solution to significant reductions in NEET, which the Slovak Republic needs, is an increase in the rate of growth of the employment rate.

This finding is important. It points to the need to find all the possibilities for a more significant increase in employment in the Slovak Republic. More intensive application of the concept of Smart approaches and the building of Smart regions is becoming a necessary. To increase employment in the Slovak Republic, it is necessary to use all available means, including more intensive enforcement of the concept of Smart regions.

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ECO-INNOVATIONS, THEIR IMPACT AND IMPORTANCE ON THE SLOVAK ECONOMY

Martina JAKUBČINOVÁ

Abstract

Eco-innovation is one of the important elements of today's eco-global revolution. They are an important tool for demonstrating progress and sustainable development of society. They have an undeniable impact in achieving a healthy balance of sustainable development in the modern global economy as well as in regional economies. This paper aims to identify the key aspects and position of eco-innovation in the SR environment. In addition to the theoretical background of the knowledge of eco-innovation policy, the focus will be on explaining the current status and results in the application of innovation policy. The research is based on standard metrics, analysis of the state of development of eco-innovation and the use of eco-innovation policy instruments in Slovakia. The paper highlights the importance of eco-innovation for the success of the economy.

INTRODUCTION

The need for eco-innovation is one of the most discussed issues today. Eco-innovation can be seen as a natural necessity for the superstructure of innovation policy. Companies and communities are discussing the issue of eco-innovation not only at a professional level, but also at a lay level. The professional community is aware that sustainable growth and development cannot be achieved without the environmental aspect of processes, practices, and technologies. The lay public is aware that changing lifestyle and respecting the needs of nature are essential for survival and increasing quality of life. Therefore, there is no doubt that eco-revolution in the form of eco-innovation is present everywhere. The turbulent socio-economic changes we are experiencing place eco-revolution, together with the concept of Smart Infrastructure and Industry 4.0, among the non-negotiables of economic growth and development. Solutions require a serious, responsible, and informed approach so that the effects and benefits can be felt by present and future generations. The actors who are driving the wave of eco-innovation, i.e., a responsible approach to innovation, are the State, business, and the public. Of the links that emerge between these actors, the most significant is the producer-consumer link and the resulting corporate social responsibility.

The ambition of this article is not to provide an exhaustive picture of the eco-innovation status, but to identify trends in the field of eco-innovation, to analyse the current status and to highlight the impact of eco-innovation in relation to the economy. Here we would like to focus on identifying the impact and linkages of eco-innovation and eco-innovation policy on the Slovak economy. The are two reasons for formulating the objectives. The first reason is to identify developments, trends and manifestations that are currently demanded and promoted in the field of eco-innovation. The second reason is to identify the impact that eco-innovation has on the economy. For this reason, the first part of the article maps the views of the professional public and intentions related to the phenomenon of eco-innovation. The second part of the article presents a methodological approach to the design, collection and conduct of the research. The third part of the article is a discussion of the results. In the final part of the article, we present and formulate recommendations for practice or further research on the subject.

LITERATURE OVERVIEW

The theoretical concept of eco-innovation has begun to permeate social science research since the beginning of the first decade of the 21st century (Platon et al., 2023; Al-Shami, Rashid, 2022; Pichlak, 2021). It has outlined a vision for policy makers, regional and global, to follow while maintaining the comfort to which society is accustomed (Tomashuk, Baldynyuk, 2023; Yunzhao, 2022). It is the actors at the local and global level, among which we include the European Union, that are expected to significantly change their behavior and approach to 'external' needs. These have so far been inadequately or marginally addressed, without a deeper sophisticated dimension.

The concept of eco-innovation is based on changes that include a systemic transformation of the way goods and services are produced, distributed, and consumed, i.e., patterns of production, trade and consumption behavior (Hojnik et al. 2023; Westman, Moores, & Burch, 2021; Pan, Sinha, & Chen, 2020). Thus, it is the modification of processes, systems, techniques, and schemes of technical and organizational characteristics of the production of goods and services in synergy with the environment. Respecting environmental needs and addressing environmental issues are prerequisites leading to achieving a faster rate of economic growth, eliminating environmental destruction, and building a prosperous modern society (Hajdukiewicz, Pera, 2023; Kowalska, Bieniek, 2022).

However, it should be noted that the introduction of eco-innovation needs to be seen as a complex endeavor requiring new approaches, knowledge, and skills. Compared to conventional innovation, society is expected to adopt a new eco-conscious mindset, taking into account not only economic gains but also environmental needs. The knowledge base is thus changing its form and nature, which is a fundamental difference between the concept of eco-innovation and innovation in the classical format.

Ahmad and Wu (2022), Jermsittiparsert (2021) and Chien et al. (2021) report a positive correlation between eco-innovation and economic growth, sustainable economic development, and high technological progress in their findings. This finding supports the trend that Europe and the world needs to follow. It also supports the visions and intentions that the leaders of the world's stable economies, grouped together in the OECD or the EU, are ambitiously pursuing in the context of community policy.

The European Union's policies and ambitions place the issue of a climate-neutral economy and a green economy (Febregue, 2023; Auzina, Zvirbule, Lamberga, 2022; Terzic, 2022) at the top of its agenda. The promotion of eco-innovation and eco-innovation policies is one of its priority themes. In the context of achieving the objectives of the European Green Deal, they significantly contribute to the transition and the fulfilment of the commitment related to the achievement of a climate-neutral circular economy.

The transition to a carbon-neutral and sustainable economy (Mentes, 2023; Hedberg, Šipka, 2022) can be described as the most ambitious goal of the community in its history. Within the production of products and services, it calls on States to streamline processes that respect environmental value (Loučanová, Olšiaková, Štofková, 2022). The impacts of the dominant classical industrial production, in synergy with the persistent trend of consumer behavior and the lack of flexibility of institutional capacities, clearly show the harmfulness and damage that society causes and transmits to the next generation. Therefore, the concept of eco-innovation and eco-innovation activities appears as a way out of the current stalemate.

Eco-innovation activity and the effects of eco-innovation application on the basis of regular evaluation can be monitored, compared and assessed through a number of indexes.

Measuring the success and effects of eco-innovation application (environmental indicators and indexes) in specific settings are indicators of EU Member States' performance in environmental innovation (Kemp, 2019), while the European Eco-Innovation Scoreboard quantifies an eco-innovation index. Based on the results, one of three conclusions can be drawn, i.e. whether a country is an eco-innovation leader, an average country or a catching-up country (MoEYS, 2018; MoEYS, 2021; European Commision, 2021).

As the literature analysis shows, there are several perspectives on the issue of eco-innovation. These can be assessed and qualified in several ways. National and international perspectives lead to a reflection on policy and environmental needs. Therefore, the purpose of this article is to identify and evaluate the impact of eco-innovation policy on the economy.

GOAL AND METHODOLOGY

For the purpose of this output, sources meeting the criteria of timeliness, uniqueness, credibility, and quality of content were used. Studies published in reputed database platforms and data recorded in statistical database platforms formed the basis. The basis of the analysis was statistical data collected through the Global Innovation Index (GII) and the European Innovation Index (EII). This was motivated by the fact that the innovative nature of processes, as measured by innovation performance indexes, is essential to achieve economic growth and economic development. The choice of indicators

was based on the need to fulfil the objective and the need to clarify interlinkages. The scope consisted of EU Member States. The analysis focused in depth on a selected country of the "Eco-Innovation Catching-up group" category, namely Slovakia. The period covered is 2013 to 2023 (the latest year of data availability). Socio-economic outcomes of eco-innovations were a priority area of investigation.

FINDINGS

In assessing and capturing global innovation trends, we can conclude that innovation is transforming the world and the global economy. The current direction leads to reflect not only on investment efficiency and assess the pace of technological progress. Increasingly, attention is beginning to focus on assessing socio-economic impacts, trends, and the achievement of global values. Global innovation trends (Fig. 1.) and their impact on the socio-economic situation are portrayed through several indexes.

Fig. 1: Global leaders in innovation

Northern America	GII23	GII22	GII13
United State of America	63,5	61,8	60,3
Canada	53,8	50,8	57,6

Europe	GII23	GII22	GII13
Switzerland	67,60	64,6	66,6
Sweden	64,20	61,6	61,4

Central and Southern Asia	GII23	GII22	GII13
India	38,10	36,6	36,2
Iran	30,10	32,9	27,3

Northern Africa and Western Asia	GII23	GII22	GII13
Israel	54,30	50,2	56
Cyprus	46,30	46,2	49,3

South East Asia, East Asia, and Oceania	GII23	GII22	GII13
Singapore	61,50	57,3	59,4
South Korea	58,60	57,8	53,3

Latin America and the Caribbean	GII23	GII22	GII13
Chile	33,30	34	40,6
Brazil	33,60	32,5	36,3

Sub-Saharan Africa	GII23	GII22	GII13
Mauritius	32,10	34,4	38
South Africa	30,40	29,8	37,6

Source: own processing according to the data of GII (2023,2022,2013)

Through GII, it is possible to identify strengths and weaknesses of innovation, monitor trends and make or draw concrete conclusions.

The GII tracks 81 indicators grouped into 7 categories (Business and Market Sophistication, Infrastructure, Human Capital, and Research,

Instutition, Creative and Knowledge-Technology Outputs).

On the basis of the observed results, we can see considerable diversity in the level of innovation uptake across countries and years (Tab. 1.).

Tab. 1: Global Innovation Index in 2013-2023

	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
Europe											
Mean	44,53	42,96	45,02	44,66	46,42	47,12	47,09	46,95	47,84	47,30	47,57
Median	44,80	42,10	44,20	43,50	45,30	46,90	46,10	46,50	46,40	45,70	47,30
Maximum	67,60	64,60	65,50	66,10	67,20	68,40	67,70	66,30	68,30	64,80	66,60
Minimum	25,40	24,40	28,00	27,10	30,30	29,90	28,40	29,60	30,50	30,50	30,90
Standard Deviation	11,527	10,754	9,738	9,768	9,727	9,921	10,094	10,078	9,680	9,333	9,108
Coefficient of Variation	3,863	3,995	4,624	4,572	4,772	4,750	4,665	4,658	4,942	5,068	5,223
Skew	0,174	0,223	0,263	0,288	0,295	0,153	0,103	0,114	0,325	0,159	0,204
Northern America											
Mean	58,65	56,30	57,20	56,45	57,80	56,55	57,55	58,05	57,90	58,10	58,95
Median	58,65	56,30	57,20	56,45	57,80	56,55	57,55	58,05	57,90	58,10	58,95
Maximum	63,50	61,80	61,30	60,60	61,70	60,10	61,40	61,40	60,10	60,10	60,30
Minimum	53,80	50,80	53,10	52,30	53,90	53,00	53,70	54,70	55,70	56,10	57,60
Standard Deviation	6,859	7,778	5,798	5,869	5,515	5,020	5,445	4,738	3,111	2,828	1,909
Coefficient of Variation	1,180	1,217	1,154	1,159	1,145	1,134	1,143	1,122	1,079	1,071	1,047
Latin America and the Caribbean											
Mean	28,90	28,40	29,84	28,44	31,46	30,83	31,24	30,53	33,10	31,33	35,37
Median	27,40	28,15	29,70	28,90	31,50	31,80	31,60	30,40	32,55	32,35	34,40
Maximum	33,60	34,00	35,10	33,90	36,60	37,80	38,70	38,40	41,20	40,60	40,60
Minimum	21,40	20,30	23,40	22,40	24,80	22,90	25,60	22,30	22,80	20,30	27,30
Standard Deviation	5,412	5,226	4,263	3,955	4,639	4,506	4,491	4,999	5,385	5,517	4,358
Coefficient of Variation	1,304	0,983	1,068	1,088	1,052	1,026	1,449	1,120	1,078	1,072	1,089
South East Asia, East Asia, and Oceania											
Mean	40,47	39,04	41,24	40,72	43,97	44,50	44,03	44,59	45,41	45,04	43,90
Median	39,00	36,80	39,55	39,75	42,70	45,60	42,70	47,00	46,75	46,10	44,70
Maximum	61,50	57,80	59,30	56,60	58,40	59,80	58,70	59,10	59,40	59,20	59,40
Minimum	18,30	17,40	20,20	20,60	26,60	28,70	27,10	27,90	29,80	29,90	28,10
Standard Deviation	14,104	13,923	12,850	12,335	10,827	10,652	10,973	11,451	11,077	10,615	10,875
Coefficient of Variation	2,957	2,795	2,535	2,633	2,195	2,084	2,166	2,118	1,954	1,980	2,114
Skew	-0,061	-0,043	-0,126	-0,226	-0,107	-0,081	-0,100	-0,198	-0,209	-0,152	0,067
Central and Southern Asia											
Mean	24,52	24,39	26,59	25,71	28,77	27,82	25,31	27,70	27,35	27,05	28,04
Median	21,75	23,60	24,80	24,45	28,40	26,50	23,80	28,90	27,75	25,65	27,15
Maximum	38,10	36,60	36,40	35,60	36,60	35,20	35,50	33,60	32,70	33,70	36,20
Minimum	18,30	17,60	20,20	20,40	23,30	23,10	17,90	22,60	21,10	23,70	23,30
Standard Deviation	6,100	6,097	4,910	4,630	4,473	4,559	5,933	4,086	3,932	3,713	4,232
Coefficient of Variation	2,027	2,080	1,618	1,459	1,470	1,479	1,467	1,455	1,550	1,416	1,448
Skew	1,286	1,108	0,977	1,236	0,715	0,581	0,616	-0,120	-0,127	0,993	0,761
Northern Africa and Western Asia											
Mean	31,44	30,96	32,41	32,11	34,65	35,74	32,36	34,91	36,08	36,63	37,07
Median	28,40	28,00	30,30	29,90	32,90	34,85	31,75	33,75	34,40	35,65	36,05
Maximum	54,30	50,20	53,40	53,50	57,40	56,80	53,90	52,30	53,50	55,50	56,00
Minimum	28,40	28,00	30,30	29,90	32,90	34,85	31,75	33,75	34,40	35,65	36,05
Standard Deviation	9,203	8,777	8,166	8,279	7,904	7,455	9,187	6,708	6,304	6,989	7,604
Coefficient of Variation	2,244	2,211	2,127	2,211	2,087	1,893	2,073	2,012	1,851	1,850	1,965
Skew	1,013	0,818	1,279	1,203	1,691	1,400	0,797	1,033	0,956	1,007	0,678
Sub-Saharan Africa											
Mean	18,04	17,82	21,98	26,61	24,24	24,81	24,91	25,29	27,02	27,67	27,59
Median	16,70	15,80	20,30	25,40	24,00	24,50	24,50	24,80	27,75	27,50	26,70
Maximum	32,10	34,40	35,20	45,80	34,00	35,10	35,80	35,90	39,20	40,90	38,00
Minimum	10,30	11,60	15,00	17,30	17,60	18,90	17,40	17,20	18,40	17,60	23,00
Standard Deviation	5,253	5,176	4,580	7,844	4,134	4,097	4,694	4,887	4,987	4,797	4,024
Coefficient of Variation	2,112	2,278	1,787	2,290	1,280	1,315	1,540	1,575	1,410	1,487	1,479
Skew	1,082	1,744	1,389	1,087	0,397	0,619	0,771	0,514	0,377	0,731	1,178

Source: own processing

So far, Switzerland achieved the highest score for innovation uptake across Europe in 2018 (GII = 68.4). Switzerland is a leader in innovation. For the last 11 years, it has been unrivalled in the top position in the GII ranking. Among the countries belonging to the European Union, the Scandinavian countries (Sweden, Finland, Denmark) are among the leaders. Among the V4 countries, the Czech Republic has the best approach to innovation and is the only country in this group to be ranked in the category „Performance in line with level of development". Slovakia's ranking is unflattering.

Despite the ambitions and assumptions, it presents, it is on the tail of the European countries. Compared to 2013, the value of the current GII has dropped by 6 points.

Based on the results, we conclude that countries are showing interest in introducing innovations. The promotion of cooperation between industry and scientific research institutions, including universities, is one of the manifestations that are the pillars of innovation policy. A natural in this direction is the increase in spending in science and research (Tab. 2.).

Tab. 2: Science and innovation investments 2021

	Scientific publications	R&D expenditures	International patent filings	Venture capital deals	Venture capital value
Short term 2020 - 2021	8,3 %	3,3%	0,9%	46%	125,5%
Long term 2022-2021	5,7%	4,6%	4,3%	7,3%	23,6%

Source: WIPO (2022)

The specific of European dimension of innovation is to emphasize the environmental needs, sustainability, equity and improving the quality of life of society. The European strategy (Fig. 2.) leads to a modern digital economy dominated by smart solutions and the creation of a functional eco-innovation system in response to the needs of the global market. Among the leaders in eco-innovation are Luxembourg (EII -

179), Finland (EII -178) and Austria (EII - 173). These countries emphasize the need to respect environmental laws and necessities. Within the eco-innovation character of the policy, the results are much more positive in the case of Slovakia (EII - 94), but also in this case the Czech Republic (EII -110) is ranked higher and in a higher category.

Fig. 2: ECO-Innovation performance of the EU Members States in 2013-2022
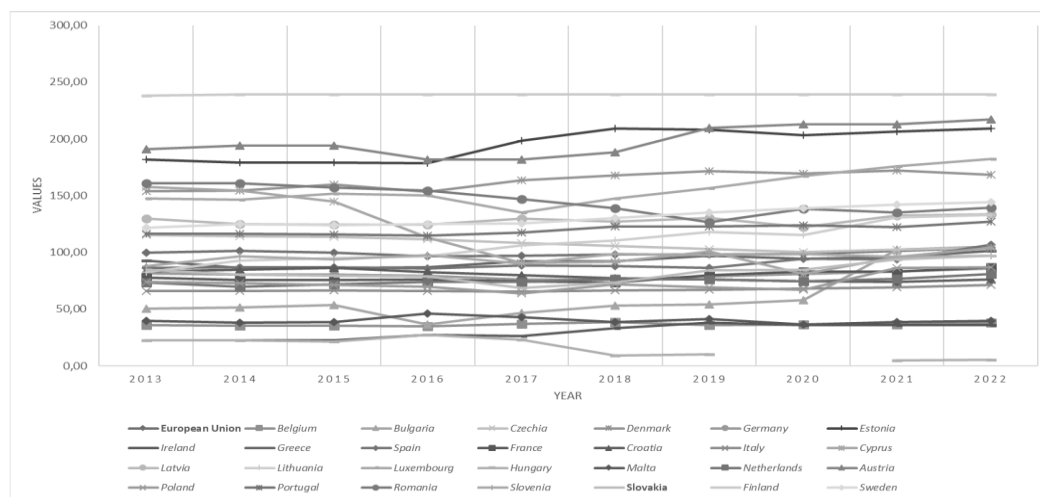
Source: own processing according to the data of own by EC (2022)

One conclusion is that there are many new opportunities. These opportunities are about understanding and the need for synergy of economic and social goals and objectives. However, the results show that it is the social impact of innovation that has remained at a low level of attention for a long time. There is a need to deepen the linkages and the potential relating to hard and soft infrastructure. To sophisticate services and production by eliminating negative environmental, social and economic impacts. To promote the development of human resources and knowledge through institutions reflecting new global needs and demands. To set policy objectives and targets to support and promote the idea of eco-innovation.

On the basis of the results, we can classify Europe as a global innovation hub. The innovation performance of the European Union countries shows a positive trend. Compared to previous years, there is a positive realignment of countries from lower to higher categories (Tab. 3.). More and more countries are catching up with the innovation leaders. In synergy with this, the value of EIIs is increasing.

Tab. 3: ECO-Innovation index of the EU Members States in 2013-2022

Category	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
European Union	100,00	103,52	105,33	106,16	107,94	109,44	111,05	112,39	115,84	121,47
Belgium	75,91	82,88	82,24	87,39	88,05	90,53	91,15	93,37	94,35	99,78
Bulgaria	25,18	29,42	31,65	29,52	30,60	36,94	39,13	44,41	55,85	57,73
Czechia	92,61	93,46	97,91	103,23	98,85	100,39	103,65	104,86	109,86	110,98
Denmark	151,84	159,14	158,30	155,34	158,41	156,50	157,40	164,11	160,93	167,49
Germany	109,83	113,43	115,90	120,16	121,85	123,16	128,37	130,93	135,76	141,18
Estonia	98,59	89,93	96,53	98,32	109,50	98,79	98,65	106,80	111,65	115,52
Ireland	77,28	78,38	82,84	87,63	98,89	101,26	100,44	100,26	100,82	110,39
Greece	55,94	60,59	70,30	69,10	76,62	73,10	92,07	85,77	93,32	101,59
Spain	104,47	106,29	105,62	104,55	105,04	107,65	106,56	108,56	112,88	116,43
France	109,58	109,07	111,89	113,62	117,72	116,09	122,33	125,06	124,64	130,65
Croatia	64,16	71,37	72,68	73,30	73,92	75,74	79,01	83,27	86,10	88,81
Italy	102,55	109,20	115,04	119,02	118,65	127,06	117,72	121,57	125,31	129,39
Cyprus	68,30	68,16	65,39	70,31	73,70	73,62	85,98	78,23	93,26	94,65
Latvia	80,06	81,25	87,35	95,80	99,44	97,75	97,80	97,15	102,07	105,37
Lithuania	66,24	71,09	73,13	78,46	85,48	81,73	87,79	92,77	98,48	103,75
Luxembourg	150,74	164,79	174,95	173,33	162,91	171,95	175,50	174,72	173,05	179,02
Hungary	52,64	60,33	77,62	58,92	58,93	64,79	63,97	65,21	69,56	81,15
Malta	51,58	50,77	57,81	60,06	68,55	93,54	79,84	79,22	78,79	79,76
Netherlands	95,10	100,04	102,99	103,14	104,34	109,65	112,29	118,23	116,03	118,78
Austria	137,27	144,80	147,84	145,08	148,90	153,12	156,52	159,63	157,23	173,86
Poland	46,45	49,34	51,07	55,25	56,52	59,07	60,98	60,49	63,88	67,37
Portugal	82,18	84,66	89,07	90,86	92,75	97,27	98,43	98,31	104,57	105,69
Romania	86,16	87,58	88,27	91,36	87,39	83,95	77,61	80,50	81,49	84,59
Slovenia	89,74	91,86	95,82	94,25	98,29	97,02	100,39	106,81	111,03	115,86
Slovakia	68,13	74,14	77,34	82,04	87,24	85,59	79,08	85,48	88,05	94,41
Finland	168,67	176,61	176,70	180,02	181,55	169,91	169,41	170,55	170,89	178,01
Sweden	152,99	157,90	156,95	159,94	161,08	163,96	168,19	163,91	157,59	160,95

▨ Eco-Innovation Leaders group	▨ Average Eco-Innovation performenrs group	☐ Eco-innovation Catching-up group

Source: own processing according to the data of own by EC (2022)

The link is to be found in the fact that higher economic growth is usually associated with higher investment, which provides the impetus for eco-innovation activities (Tab. 4.). We can also conclude that, due to the need to achieve the objectives of the Green Europe strategy, the eco-innovation has effect on the economy. The stronger and more stable countries are, the more they are able to invest and develop eco-innovation policies.

Tab. 4: GDP of the EU Members States in 2013-2022

	2013	2014		2015		2016		2017		2018		2019		2020		2021		2022	
	GDP	GDP	grow	GDP	grow	GDP	grow	GDP	grow	GDP	grow	GDP	grow	GDP	grow	GDP	grow	GDP	grow
European Union	25060	25430	1,6	25960	2,3	26410	2,0	27110	2,8	27620	2,1	28060	1,8	26450	-5,6	28050	6,00	28950	3,40
Belgium	33490	33870	1,6	34360	2,0	34620	1,3	35040	1,6	35510	1,8	36110	2,2	34050	-5,3	36230	6,90	37040	3,00
Bulgaria	5390	5470	0,9	5700	3,4	5910	3,0	6120	2,7	6330	2,7	6630	4,0	6400	-4,0	6950	7,70	7680	3,90
Czechia	15160	15480	2,3	16290	5,4	16670	2,5	17490	5,2	17990	3,2	18460	3,0	17400	-5,5	18020	3,60	18460	2,40
Denmark	44410	44890	1,6	45630	2,3	46720	3,2	47740	2,8	48450	2,0	48970	1,5	47680	-2,4	50740	6,80	51660	2,70
Germany	33330	33920	2,2	34130	1,5	34610	2,2	35410	2,7	35650	1,0	35950	1,1	34550	-3,8	35630	3,20	36010	1,80
Estonia	12540	12960	3,0	13230	1,9	13620	3,2	14410	5,8	14920	3,8	15450	4,0	15260	-1,0	16350	7,20	16250	-0,50
Ireland	37080	40070	8,8	49420	24,5	49730	1,8	53750	9,3	57610	8,5	59840	5,3	63120	6,6	72110	15,10	77430	9,40
Greece	16630	16830	0,5	16900	-0,2	16890	-0,5	17110	1,1	17430	1,7	17780	1,9	16150	-9,3	17600	8,40	18710	5,60
Spain	21850	22220	1,4	23090	3,8	23780	3,0	24440	3,0	24890	2,3	25180	2,0	22250	-11,2	23690	6,40	24910	5,80
France	31170	31320	1,0	31540	1,1	31770	1,1	32360	2,3	32800	1,9	33250	1,8	30630	-7,5	32490	6,40	33180	2,50
Croatia	10480	10480	-0,4	10810	2,5	11290	3,6	11800	3,4	12250	2,8	12740	3,4	11700	-8,6	13610	13,80	14660	6,30
Italy	25620	25620	0,0	25860	0,8	26240	1,3	26730	1,7	27030	0,9	27230	0,5	24910	-9,0	27120	8,30	28220	3,70
Cyprus	20450	20310	-1,8	21120	3,4	22410	6,6	23470	5,7	24500	5,6	25510	5,5	24360	-3,4	26530	9,90	27490	5,10
Latvia	9980	10270	1,9	10760	3,9	11110	2,4	11590	3,3	12140	4,0	12300	0,6	11940	-3,5	12870	6,70	13280	3,40
Lithuania	10810	11290	3,5	11620	2,0	12070	2,5	12760	4,3	13400	4,0	14060	4,7	14060	0,0	14870	6,30	15100	2,40
Luxembourg	82700	82880	2,6	82810	2,3	84840	5,0	84090	1,3	83510	1,2	84280	2,9	82130	-0,9	86690	7,20	86130	1,40
Hungary	10330	10790	4,2	11220	3,7	11500	2,2	12020	4,3	12690	5,4	13310	4,9	12730	-4,5	13690	7,10	14350	4,60
Malta	17650	18610	7,6	19920	9,6	20130	3,4	21700	10,9	22510	7,4	23170	7,1	20840	-8,1	23270	12,30	24320	6,90
Austria	36180	36130	1,4	36140	2,0	36390	2,2	36980	2,9	37690	2,4	38070	2,0	35390	-3,9	36740	6,20	38080	4,30
Netherlands	38180	38580	0,7	39170	1,0	39810	2,0	40730	2,3	41450	2,2	41980	1,5	40130	-6,6	42390	4,20	43800	3,80
Poland	10030	10420	3,8	10890	4,4	11220	3,0	11800	5,1	12500	5,9	13070	4,4	12810	-2,0	13770	6,90	14620	5,30
Portugal	16050	16260	0,8	16620	1,8	17010	2,0	17650	3,5	18190	2,8	18670	2,7	17100	-8,3	18090	5,70	19310	6,80
Romania	6860	7160	4,1	7420	3,2	7680	2,9	8360	8,2	8910	6,0	9300	3,9	9000	-3,7	9600	5,70	10080	4,60
Slovenia	17160	17620	2,8	17990	2,2	18550	3,2	19440	4,8	20240	4,5	20780	3,5	19770	-4,2	21350	8,20	21860	2,50
Slovakia	13300	13640	2,7	14340	5,2	14590	1,9	15000	2,9	15580	4,0	15960	2,5	15400	-3,3	16200	4,80	16340	1,80
Finland	34660	34390	-0,4	34460	0,5	35330	2,8	36380	3,2	36740	1,1	37150	1,2	36220	-2,4	37290	3,20	37780	1,60
Sweden	40510	41180	2,7	42580	4,5	42920	2,1	43430	2,6	43760	2,0	44180	2,0	42910	-2,2	45280	6,10	46250	2,80

Source: own processing according to the data of own by EC (2022)

When assessing the Slovak economy, it is nothing new that Slovakia lags behind the EU average to a large extent. This places Slovakia in the group of countries with the lowest eco-innovation performance. It is possible to change this situation if the idea of eco-innovative development and growth is fully addressed and promoted. In Slovakia, the first efforts to apply eco-innovation and to change traditional production processes are beginning to emerge.

Important are the possibilities of drawing on aid and support through operational programs. The ideas of green innovation are also embedded in other documents produced by various ministries, ranging from agriculture, economy, environment, and education. Within the framework of the Recovery and Resilience Plan of the Slovak Republic (2022), EUR 6.4 billion are earmarked for this purpose (Tab. 5).

Tab. 5: Recovery and Resilience Plan of the Slovak Republic

AREA AND COMPONENT	ALOCATION
GREEN ECONOMY	2,1 bilion €
Renewable energy and energy infrastructure	207 mil. €
Buildings renovation	620 mil. €
Sustainable transport	759 mil. €
Decarbonisation of industry	368 mil. €
Adaptation to climate change	149 mil. €
QUALITY EDUCATION	818 mil. €
Availability, development and quality of inclusive education at all levels	210 mil. €
Education for the 21st century	449 mil. €
Improving the performance of Slovak universities	159 mil. €
SCIENCE, RESEARCH AND INNOVATION	670 mil. €
More effective management and strengthening of funding for research, development, innovation and the digital economy	576 mil. €
Attracting and retaining talents	94 mil. €
BETTER HEALTH	1,4 bilion €
EFFICIENT PUBLIC ADMINISTRATION AND DIGITALISATION	1,0 bilion €
Digital Slovakia (State on the move, cybersecurity, fast internet for everyone, digital economy)	561 mil. €
REPowerEU	403 mil. €
Energy and permitting processes	150 mil. €
Renovation and management of buildings	149 mil. €
Green skills development	15 mil. €
Sustainable transport	85 mil. €
Communication and coordination	3,5 mil. €
Total	6,4 bilion €

Source: own processing according to the data of own by Plan obnovy (2022)

DISCUSSION AND CONCLUSION

The objective set out in the introduction of the article can be considered to have been met. The author has identified the key aspects and position of eco-innovation in the current global environment.

Evaluatins and comparisons of eco-innovation performance of countries lead to serious steps and reflection on the further being of society. The results and rankings based on both European and global indexes indicate that society is keen to address these issues and to be closer to energy carbon neutrality again. The eco-innovation indexes illustrate the desire to be more efficient but in synergy with the application of eco-innovation in production and consumption.

There has also been a repositioning of the status quo. All countries, but especially those of the European Union, are placing emphasis on a green and sustainable economy, energy and life. Eco-innovation is thus current and alive.

As the data presented shows, there is a link between eco-innovation and the success of the economy. The link between eco-innovation, or eco-innovation policy, and GDP has been identified, based on cross-country data comparisons. Therefore, we conclude, that the more stable and developed countries are more smoothly fulfilling the intentions of an eco-green society. However, the efforts of less developed countries to move closer to the leaders and move forward together cannot be denied either. In case of Slovakia, we can state that the Slovak economy is far below average in this area, however, the initiative to modernise the environment and create favourable conditions cannot be denied.

Political efforts to introduce eco-innovation, financial and legislative support, process sophistication and much more are ways to achieve the objectives and grow economically at

the same time. A favourable environment allows the environmental dimension to develop more quickly to meet commitments. We consider the Recovery Plan to be important, but also other schemes will help small and medium-sized enterprises to cover the high costs of introducing innovation.

In the context of new opportunities and challenges for the business environment, we also need to think innovatively in the field of education. The most sensitive approach to this issue is needed in the question of workforce training for industries. The intensity of change is strongest in the IT and automotive industries. In case of the automotive industry, countries that are categorised as 'assembly workshop' (e.g. Slovakia) are proving problematic.

As the issue of eco-innovation is complex and challenging, a number of facts and circumstances need to be analysed. For this reason, it is necessary to further focus on identifying key elements, actors and attitudes, thereby eliminating gaps and identifying opportunities. To participate together in the renewal and growth of society life quality, to progress economically and socially, to develop ideas for a better and healthier civilisation, and last but not least to preserve and enhance higher values and aims.

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SMART CONTRACTS AND BUSINESS DECISION

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Abstract

In the last 10 years the blockchain technology has become mainstream research topic because of its features that offers, as: decentralized system, peer to peer (P2P) transaction, distributed consensus, and anonymity properties. Also, the blockchain technology overshadows regulatory problem and technical challenges and one of the opportunities that offers the blockchain technology is the 'smart contract'. A smart contract is a set of programs that can be much better from the traditional contracts for some features which are self-verifying, self-executing and tamper resistant. Also, smart contract with the integration of blockchain technology without which cannot function, is capable of doing a task in real time with very low cost and provide a greater degree of high security level. The aim of this paper is to explain the concept of the smart contract and its components and function. The paper is aimed at presenting the issue of smart contract, blockchain technology. The specific focus was on the application of smart contracts in real estate.

Key words:
Contracts, blockchain technology, real estate, business, contract law

INTRODUCTION

The world is built on contracts and no individual or firm on earth can function in current society without the use and reuse of contracts. The task of creating, maintaining, and enforcing contracts have become so complicated that entire judicial and legal systems have had to be setup in the name of "contract law" to support it. Most of all contracts are in fact overseen by a "trusted" third party to make sure the stakeholders at the ends are taken care of as per the conditions arrived. There are contracts that even talk about a third-party beneficiary. Such contracts are intended to have an effect on a third party who is not an active (or participating) party to the contract (Levi, Lipton, 2018; Giancaspro, 2017). Settling and arguing over contractual obligations takes up the bulk of most legal battles that civil lawsuits are involved in. Surely enough a better way to take care of contracts would be a godsend for individuals and enterprises alike. Not to mention the enormous paperwork it would save the government in the name of verifications and attestations.

After its inception in 2009 the Bitcoin cryptocurrency has undergone a meteoric rise. The transactions involving bitcoins are stored as an electronic payment system in a public, distributed, decentralized, and shared ledger that needs no intermediaries such as a central bank. Due to the use of cryptographic techniques, the distributed ledger, now named Blockchain, is immutable and auditable, thus providing an uncensored source of trueness. Regardless of this concept, blockchains can be seen as special types of distributed database systems, i.e. a platform for data analytics (Giancaspro, 2017). Blockchains are different because they have centralized control, which ensures that no one person has the ability to roll back or alter the past, whereas conventional centralized databases are centrally managed by an agency who can change access rules or modify records.

Blockchains also made event-driven, self-executing code statements known as smart contracts possible. They allow for the encoding of rules and circumstances decided by the various trading parties. Those contracts execute pre-specified tasks autonomously, such as settling a deal, by analyzing changing environmental conditions in accordance with the embedded rules of the deal. There is currently tremendous regulatory confusion about the status of smart contracts and blockchains. In addition, there are technology shortcomings which need to be addressed before smart contracts can be completely accepted and adopted.

The smart blockchain technology is in a good way of usage. This is proven even form the number of people who have started to make their personal contract based in this blockchain technology. Based on a report done by the cointelegraph.com on April 23, 2020 by 'Joshua Mapperson', related to smart contracts. Based on his analyzes have concluded that the most preferable for people is the Ethereum smart contract which belongs to public blockchain. Based on his report the total number of the Ethereum blockchain has reached nearly 2M (1,971,632), and the highest level of use has reached on March 2020. Below in the Chart 1, are shown these numbers of contracts per every two months since May, 2019.

Chart 1: Number of Contracts every 2 months

Source: https://cointelegraph.com/news/ethereum-smart-contracts-up-75-to-almost-2m-in-march
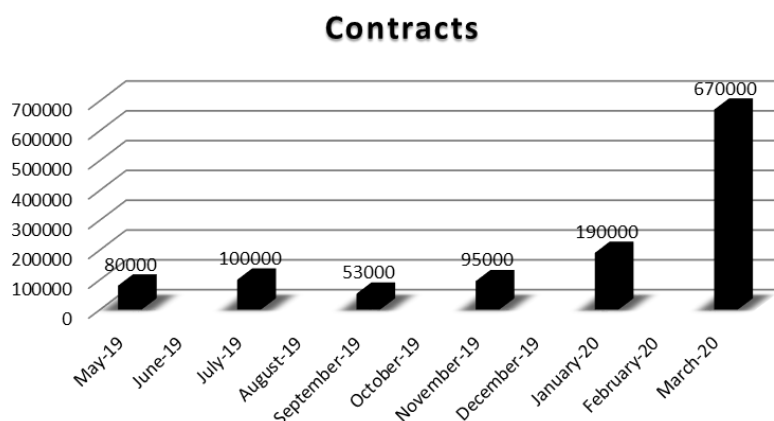
As can be seen from the chart above, the number of smart contracts last 5 months has a huge increase in usage thing that makes us conclude that people are understanding more and more the way how smart contracts can replace the traditional contracts.

And below in the chart 2, based on the previous chart where is shown the usage number for smart contracts we have tried to add a polynomial trend-line and in the chart 3 we have used the linear trend-line where in both are shown forecast for this period. Based on this analyze we can conclude that number of smart contracts is increased and will keep doing this for a good period time.

Chart 2: Polynomial Trendline Chart

$$y = 13,795x^2 - 1E+06x + 3E+10$$
$$R^2 = 0,8956$$
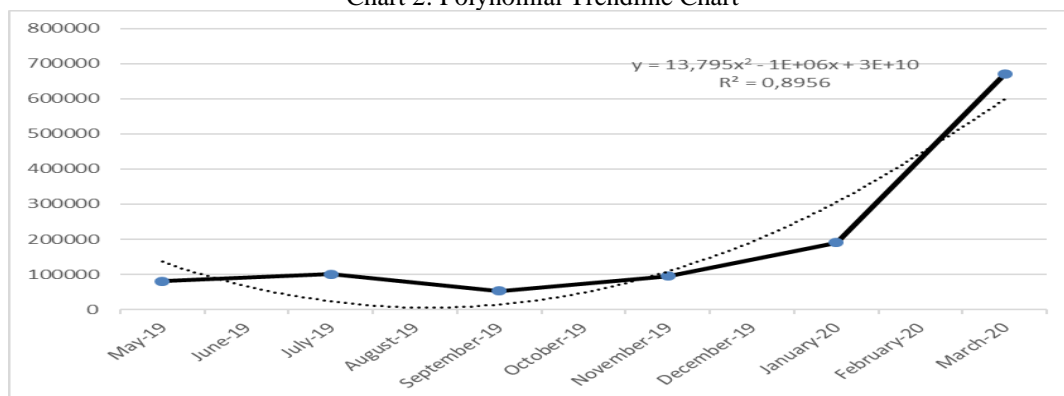
Source: own processing

Chart 3: Linear Trendline Chart

$$y = 1519,6x - 7E{+}07$$
$$R^2 = 0,5424$$

Source: own processing

LITERATURE REVIEW

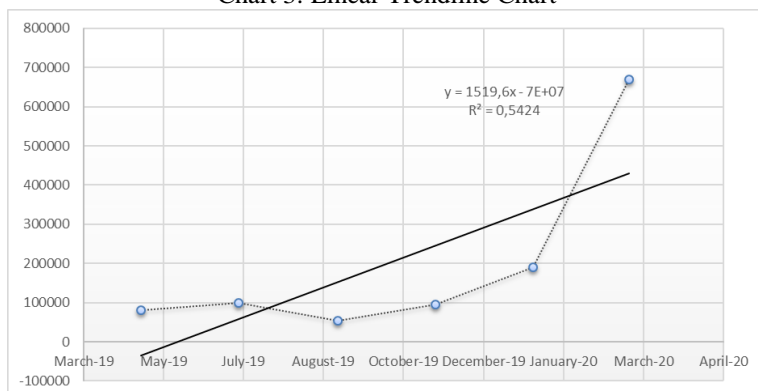According to Carvalho, Gilcrest (2018) and Sadiku, Eze, Musa (2018) the idea of the term 'smart contract' was firstly proposed by Nick Szabo, a computer scientist and cryptographer. Based on him, briefly, a smart contract can be looked as a self-executable computer program or computer code that is able to carry out the terms of a small data contract or big data like a business agreement between two or more parties. Smart contract contains automate algorithms, which are used to be executed when any certain conditions are met.

In the Fig.1 is shown a model of those algorithm, how the program is running step by step during any execution of any operation. Suppose a smart contract C that has as input 3 conditions X, Y and Z. and produces an output operation Q. Based on this logic a smart contract is executed. Complexity of any smart contract is depended by the input conditions (X, Y, Z or more), and the required output.

Is also important to be said that there is some smart contract which may have an arbitrary amount of operational conditions. But in practical terms and conditions, any modern smart contract is able to execute successfully any algorithm, started form the simplistic procedure as in Fig. 1 to much more complex procedures for executing a required operation.

Fig. 1: Execution logic of a smart contract C
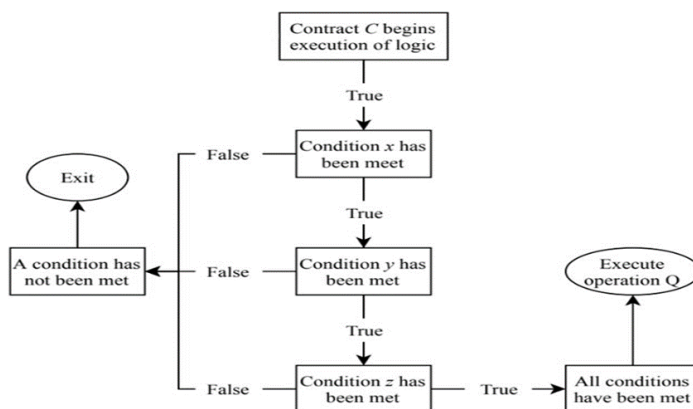
Source: Carvalho, A., Gilcrest, J. (2018). "Smart Contracts: Legal Considerations"

As can be seen from the Fig. 1 where is explained the logic of execution of a simple contract between two parties, passes through some steps. Firstly, the program starts running and then the program faces with inputs, which in this event are the conditions. In this example are total 3 conditions, but there can be less conditions or more conditions in some more complex programs. If any of those three conditions X, Y or Z is not met by the operation of the contract Z, then this contract operation will be terminated and the program will require from user to Exit. Otherwise if all the three conditions will be met, the program will show to user that the Contract C is executed in operation Q and the program is finished with the procedure of executing a smart contract.

How Smart Contract Works

A smart contract is a user-defined program running in blockchain technology. Smart contracts allow the execution of valid transactions between multiple agents, without any third parties. The main goal of any smart contract is to provide security that is superior to traditional contract law while reducing the transaction cost too (Mohanta, Panda, Jena, 2018; Sadiku, Eze, Musa, 2018). All smart contracts have some features which makes the smart contracts much better and more trustable for users despite the traditional contracts, Fig. 2.

Fig. 2: Features of Smart Contracts

Source: own processing

Applications of Smart Contract

A Smart Contract can be useful in a wide range of industries and companies or institutions such as healthcare, automobiles, real estate, insurance, lotteries, supply-chain management, cryptocurrency exchanges, financial exchanges, covenants, law, government (e-voting system), creating a will and many more fields (Sadiku, Eze, Musa, 2018; Yining, Manzoor, Seneviratne, 2019; Norta, Kormiltsyn, Udokwu, 2018). Below we will mention some applications where this technology can be used, in such as:

Automobile: For example, for self-parking vehicles, smart contracts could put into place a means of detecting who was at fault in a crash (if this happens). With the use of smart contracts, any automobile insurance company could charge rates differently based on conditions that are agreed and the situation that is created (after a crash).

Real Estate: For example, a real estate owner rent one apartment to tenant X, and the ledger can cut the costs based on the conditions agreed. All you do is to check the conditions and if both parties agree can easily sign the contract and doing payment easily, by paying via online payment or (cryptocurrencies) and encode your contract on the ledger (where cannot modified by approvement of both parties). You accomplish automatic fulfilment.

Healthcare: The health insurance contract can be made online through the blockchain and this will enable it to be viewed in any health institution. Since the contract is registered on the blockchain, all hospitals have access to see it. As well the ledger can be used for healthcare management, such as supervising drugs, regulation compliance, managing healthcare supplies and other parts of health field.

Smart contracts are appealing for a variety of reasons in Table 1. Differences between traditional and smart contracts are in Table 2.

Tab. 1: Benefits of Smart Contracts

Autonomy
•There is no need to rely on third parties, which could be biased or not have your interests at heart.
Trust
•Your documents are encrypted on a shared ledger, and all parties can have access to them.
Redundancy
•Documents are duplicated many times over on the blockchain, and can't ever be "lost".
Safety
•Documents are encrypted, making them near-impenetrable by hackers.
Speed
•These contracts automatically self-execute, saving you precious time.
Savings
•Smart contracts save you money by taking out the middleman.
Precision
•Smart contracts execute the exact code provided, ensuring zero errors.
Transparency
•For organizations like governments, they could add another level of transparency to dealings.

Source: own processing

Tab. 2: Differences between TC and SC

	Traditional Contract	**Smart Contract**
Execution	From the signing till termination (agreed by parties or not)	Immediate and irrevocable
Readability	Easy for humans	Easy for machines (difficult for humans)
Adaptability of contracts to external events	Possible subject to parties involved in agreement	Difficult – contract stored in public blockchain Possible – contract stored in closed blockchain
Drafting	Slow – requires lawyers, originals exchanges and signing	Fast – if you can program Slow – if you require for programmers
Security	Limited	Cryptographically Protected
Archiving	Difficult	Easy
Data Extraction	Possible but very slow	Immediate / Automatic
Confidentiality	Good	None – if is stored in public ledger Excellent – if is stored in private ledger

Source: https://steemit.com/smartcontract/@blockchains-exp/differences-between-traditional-contract-and-smart-contract-more-here-https-www-blockchains-expert-com-en-are-smart-contracts-d6d6094f349b6

Blockchain Technology

A blockchain is a distributed database system that can keep records of all transactions that have ever occurred in the blockchain network. This database is replicated and shared among the network's participants. The main feature of blockchain is that, the blockchain allows even untrusted participants to have a communication and make transactions between each other in a secure way without the need of having a trusted third party, as traditional ones.

Blockchain contains an ordered list of blocks (of what is built), where each block is identified by its cryptographic hash that are unique. Each block contains information of the block that came before it, resulting in a chain of blocks (Alharby, Moorsel, 2017). Each block consists of a set of transactions that are done. After a block is created and then appended to the blockchain, the transactions in that block cannot be changed or reverted or manipulated. This is done to ensure the integrity of the transactions and in this way prevent double-spending problem.

As the first generation of the blockchain technology are emerged the cryptocurrencies. Cryptocurrencies are basically digital currencies (maybe future of fiat currencies) which are based on cryptographic techniques and peer-to-peer network. The first and most popular example of cryptocurrencies is Bitcoin. Bitcoin contains an electronic payment system which allows any two untrusted parties to exchange digital money with each other in a secure manner in blockchain without going through a middleman (as bank).

Transactions that occurred in the network can be verified by special nodes known as miners. Verifying a transaction is the process of checking the sender information and the content of the transaction. Miners generate a new block of transactions in the blockchain technology by solving a mathematical puzzle (called as Proof of Work) and then spread that block to the network. Other nodes in the network are used for making the validation of the correctness of the generated block and the build process is done only if it was generated correctly. However, Bitcoin system has a limited programming capability which are used to support even more complex transactions.

Other types of blockchains such as Ethereum have emerged the second generation of blockchain to allow building complex distributed applications beyond the cryptocurrencies, process that was not available at first generation (Blockchain). Smart contracts, for what will be discussed next in the following section, this type of contracts is considered as the main element of this new generation. Ethereum blockchain is the most popular and most used blockchain for developing the smart contracts. Ethereum is a public blockchain with a built-in Turing-complete programming language to allow writing any smart contract and any decentralized application (Alharby, Moorsel, 2017; Philippe, 2017).

There are two types of blockchain which are divided in public or private blockchain system. In the public blockchains, any anonymous user can join the network, to read the content of the blockchain and to send a new transaction or to verify the correctness of the blocks. Examples for the public blockchains are listed Bitcoin, NXT and Ethereum. In other hand, in the private blockchains, only authorized users which have permissions are able to join the network, to write or to do any transactions to the blockchain. It can be a company or a group of companies that are usually responsible for giving users the permissions for having access and joining the network. Examples for the private blockchains are Ever-ledger, Ripple and Eris.

The Automated Nature of Smart Contracts

One of the key attributes of the smart contracts is their ability for having an automatic and relentlessly execute during transactions without having the need for human intervention. However, this automation nature and the fact that smart contracts cannot easily be amended or terminated unless both the parties included in the contract incorporate for capabilities during the process of creation of the smart contract, present some of the greatest challenges which can be facing widespread during the adoption of smart contracts.

For example, with traditional paper contracts, a party can easily excuse a breach, simply by not enforcing the available penalties. If a valued customer is late with doing its payment for one month, the vendor can make a real-time decision for preserving the long-term commercial relationship as more important than any available termination right or for allowing customer to pay late fee. However, if that partnership had been reduced to a smart contract,

there would probably not be the option of not implementing the agreement on an ad hoc basis. A late payment will result in the automatic withdrawal of a late fee from the customer's account or the suspension of a customer's access to a software program or device connected to the Internet if that is what the smart contract was programmed to do. The automated execution provided by smart contracts might therefore not align with the manner in which many businesses operate in the real world (Torres, Brann, 2019; Karamitsos, Papadaki, Al Barghuthi, 2018).

Similarly, in a paper text-based contractual relationship, a party may be willing to accept, on an ad hoc basis, partial performance to be deemed full performance. This may be due to an interest in sustaining a long-term relationship, or because a party decides that partial success is preferable to no success at all. Again, smart contract code objectivity cannot reflect the reality of how contracting parties communicate.

Amending and Terminating Smart Contracts

There is actually no easy way to amend a smart contract, posing some problems for contracting parties. For example, if the parties have mutually agreed to alter the terms of their contractual agreement in a typical text-based contract, or if there is a change in legislation, the parties may easily draft an amendment to resolve the change, or simply modify their course of actions. Actually, smart contracts do not deliver the versatility. Nevertheless, since blockchains are permanent, it is much more difficult to change a smart contract than to change standard software code which does not reside on a blockchain. The consequence is that changing a smart contract will result in higher transaction costs than amending a text-based contract, which raises the margin of error that the parties do not correctly represent the changes they wish to make. There are common issues as to ending a smart contract. Assume a party discovers a mistake in an agreement that gives the counterparty more rights than intended, or decides that it will be much more expensive to satisfy its specified obligations than anticipated. A party can engage in, or threaten, so-called "effective breach" in a text-based contract, i.e. knowingly breach a contract and pay the resulting damages if it decides that the cost to conduct is greater than the damages that it will owe. In addition, a party

can bring the counterparty back to the table to negotiate an amicable resolution by ceasing results, or by threatening to take that action. Smart contracts also don't provide similar self-help remedies (Karamitsos, Papadaki, Al Barghuthi, 2018).

Projects are currently under way to build smart contracts which can be terminated at any time and updated more easily. Although this is in several respects antithetical to the unchanging and automatic existence of smart contracts, it illustrates the fact that smart contracts can only achieve market adoption if they reflect the business reality of how contracting parties behave.

Smart Contract for Real Estate

For this use case, the Blockchain of any platform type can be selected. The real estate serves as landlord for the properties that allow the use of blockchain technology to rent a variety of residential and commercial properties.

Analysis Phase

A collection of requirements from various individuals into the organization is needed during the analysis process. A series of workshops are then developed to explain how blockchain technology and smart contracts can provide organizational benefits and recognize participants, positions, and responsibilities.

Actors/Roles Externally Owned Accounts (EOA):

The landlord and tenants as outsourced accounts held. Private keys control those accounts. This actor can create value transfer transactions, create smart contracts or call contract functions.

Contract Accounts (CA):

Their own code manages those accounts. Every time a message is sent, it executes its code, allowing it to read and write to internal storage and send messages to other contracts or build contracts in return.

Miners:

They validate the blocks and transactions. The transactions are enclosed in a block, and a proof of work for this block is given. After the transaction is validated into the chain, miners are given a sum as a reward. We have chosen private Blockchain for the particular use case then the mining is not important as the parties are already identified and trusted.

Design Phase

The design of the smart contract will be established after identification of the entities and setting up of the accounts. Functions, procedures, status variables, incidents and transactions are the key components of the smart contract.

Real Estate Smart Contract Functions

The smart contract is between a landlord / owner of real estate and the tenants. The contract's aim is to ensure the rental agreement is signed, the rental sum is paid on time and the contract termination is performed correctly. The following describes the smart contract functions:
Functions-Created: The Landlord initiates the contract by setting up the rental terms and the details of landlord and tenants. After that, the state of the contract is set to "CREATED".
Functions-Started: Tenant signs the contract and rent begin and the state of the tenant is set to "STARTED" when the state is "STARTED", the rental agreement cannot be confirmed again, thus eliminating the possibility of overwriting the current tenant.

Functions-Rent Collection: The smart contract collects rent from the tenants and sends it to the landlord. This is a powerful feature of this contract to makes it "SMART".
Functions-Terminated: When the Landlord terminate the contract, the state set to "TERMINATED" and all balance deposit is sent to the tenant after checking the status of the property.

Real Estate Smart Contract Processes

For this use case, the process is one-to-many parties and the definition of the processes is described as follows:
Rent Contract Signature Process
In this process, both parties sign the smart contract (rental agreement) which include in details the rental value, payment frequency, and Real Estate Owner and Tenant's details. There is a blockchain in between both parties which is a trust and safe source for making available a smart contract that contents details from both parts. After agreeing with the conditions and this contract is signed, there is no possibilities for doing changes or manipulations. This model is showed below in the Figure 3.

Fig. 3: Process rent contract "signature"
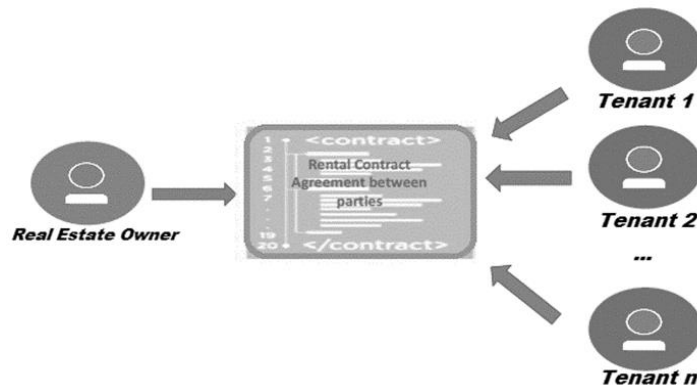
Source: Karamitsos, Papadaki, Al Barghuthi, 2018, own processing

Rental Payments Process

This process is based on terms and conditions of the rental agreement. The smart contract initiates the lease payments from the tenants to landlord and FM contractors using different mode of payments. This model is very good because of the opportunities that offers for the payment process, more used are cryptocurrencies, based on (Karamitsos, Papadaki, Al Barghuthi, 2018). The model is shown below in the Figure 4.

Fig. 4: Process rent contract "payments"

Source: Karamitsos, Papadaki, Al Barghuthi, 2018, own processing

Termination Rent Contract Process

This process is on the termination rental as is shown below. The smart contract triggers the payment of security deposit back to tenants after checking and adjusting any damage repair charges. Termination of the contract can come based on different conditions and may have consequences, everything accorded in agreed conditions and laws. Model is shown below in the Figure 5.

Fig. 5: Process rent contract "termination"
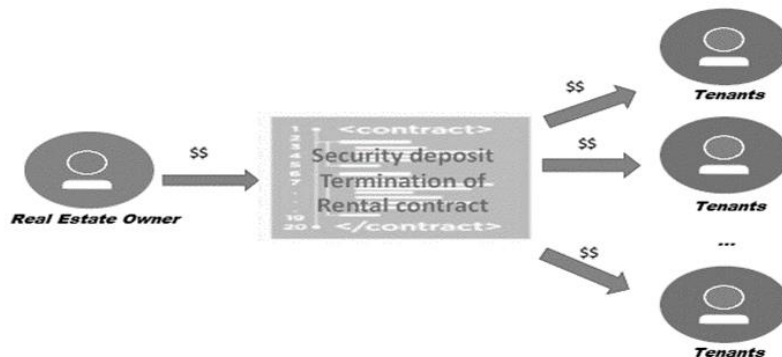
Source: Karamitsos, Papadaki, Al Barghuthi, 2018, own processing

Implementation Phase

In this implementation phase, is done the code programming part for the smart contract for the agreement of the real estate owner and the tenant. Functions and processes for this agreement are defined in the previous phase, in design phase and now these processes are just translated into the code program. The content or the structure of the code for the smart contract is shown below in the following, Fig 6.

Fig. 6: Implementation Phase
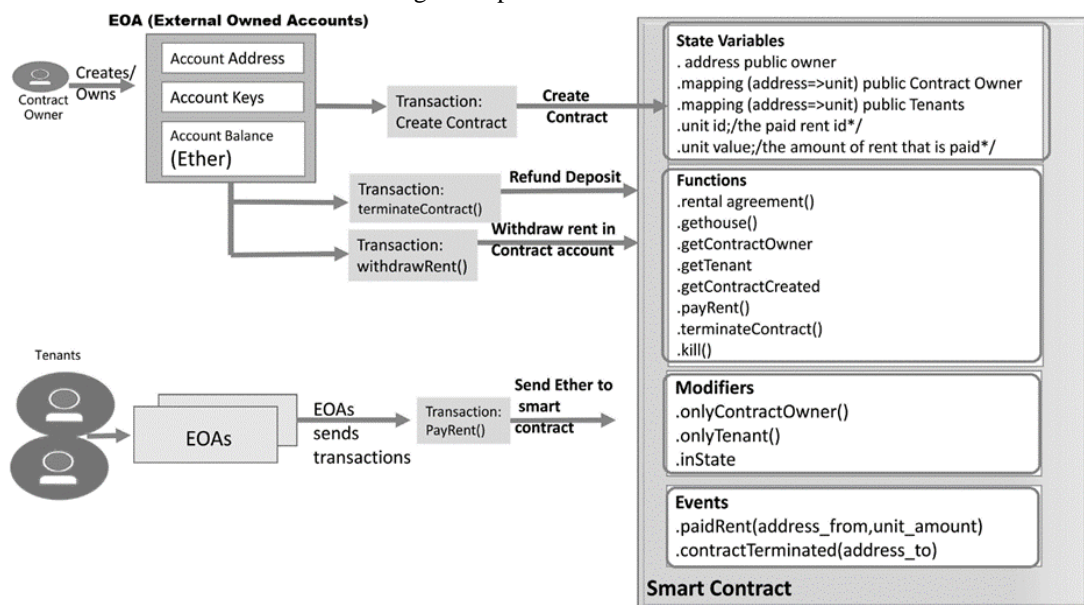
Source: Source: Karamitsos, Papadaki, Al Barghuthi, 2018

The implementation of the smart contract contains the code phase where the contract is prepared from a software engineer or programmer and the contracting parties need to complete with the information. In this case is shown a smart contract for real estate.

State Variables: In this part are listed the information that are needed by the state where should be listed the address of the object, the owner and the tenant and also information about rent payment. This information is only for the state party.

Functions: This is the main part of the code where are written all conditions of this contract as date of starting, date of terminating, payment, conditions, consequences per each if they want to kill this contract.

Modifiers: This is the part that shows who have the right access on this contract and can be able to do modification (with permission of both parties).

Event: Is the part for what the parties agreed as the price for rental, previous address, or the next address if there will have a termination of the contract.

GOAL AND METHODOLOGY

The aim of this paper is to explain the concept of the smart contract and its components and function. The paper is aimed at presenting the issue of smart contract, blockchain technology. The mentioned issue is a challenge in all areas of business and economy. The first stage of our research focused on the collection and search of secondary data of published studies in this field. The survey focused on relevant sources in the indexed databases Web of Science and Scopus. The collected data allowed us to identify the areas in which smart contracts can be used, as well as identifying their benefits. A comparison between traditional and smart contracts was carried out as part of the study. The specific focus was on the application of smart contracts in real estate. Based on the knowledge gained, the findings compiled an explanation to the code in the software that can be used in the case of smart contracts for Check legal compilance. The study has been based on general scientific methods (generalization, comparison, analysis, and synthesis).

FINDINGS

Every smart contract should be as legal as the physical one, in this way known from the parties in the contract and the state where the state will protect and known as legal contract of the contracting parties. For achieving this, needs the software to be installed on any smart contract.

This type of software is a pre-made pseudo code that will automatically process to each question to check its legality. The result of each "legal analyze" will be accompanied by "Yes" or "No".

Based on this process, we tried to make some notes that deal with the appearance of such a code. Below is shown a text which explains the parts of the code and tells what does mean every command.

```
PROGRAM: "Check Legal Compliance"
//compliance refers primarily to the GDPR
//YES means that the answer to the question is either YES or Configurable in the
//SLA
// The symbol "//" implies a comment line, meaning the text after // does not
//affect execution, it is only used to explain the specific program line and enhance
//code readability
// The word " LEGAL_COMPLIANCE" is a variable, meaning a position in the
//memory structure of the computing system that holds the value (outcome of the
//analysis: true or false for being legally compliant)
// The symbol "=" is an assignment operator, meaning that the value at the right of
//the "=" is stored in the memory position that is indicated by the (variable) name
//on the left of the "="
//The symbol "==" indicates equality between the elements (variables and/or
//values) to the left and right of the symbol
//The word "Return  LEGAL_COMPLIANCE" means stop executing and return
//the value of the variable  LEGAL_COMPLIANCE at that point
```

In addition, a code has been written that will ask some questions related to the contract that is done and also, refers to sensitive topics that users would often want to avoid. This part or process is very important for a smart contract, because it provides personal data protection also, will prevent invalid access that can in any way touch that part of the data and in this way will not allow the lose the existing database.

Because commitments to the contract will not be sufficient, the programmers have prepared a code that is technically implemented and automatically protects the data taken from the smart contract.

But since not everyone can apply standards and laws, in this pseudo that if the issues are not in line as need to be with the laws of the European Union, they will be automatically rejected. This part of the code is shown below.

```
LEGAL_COMPLIANCE=True;

If (L001==YES){
            If ((L002==NO)OR(L005==NO)OR(L006==NO)OR(L007==NO)
            OR(L008==NO)OR(L012==NO)){
                    LEGAL_COMPLIANCE=False;
                    Return  LEGAL_COMPLIANCE; //stop legal  analysis,
                    final conclusion is reached
}

If (L003==NO){ //if not based in the EU, you need to be certified for BCR for EU
usage
        If (L011==NO){
                    LEGAL_COMPLIANCE=False;
                    Return  LEGAL_COMPLIANCE;  //stop legal  analysis, final
                    conclusion is reached
}

If (L003==YES){// if based in the EU,
        If (L009==YES){ //and you can offer the possibility to delete data
                    //do nothing, legal compliance has been set to true before
                    }
```

And finally, if everything during the legal analyze process is in order and according to the legal regulations, in the agreement it will look like the following code:

```
{
    "questionNumber":1,
    "questionText":" Does your SaaS application deal with sensitive/personal data?"
    "answer":true
}
```

In this manner, for the case where are completed analyze done with the set of questions, and then it is saved in the archive within the archive it automatically will be listed as part of that contract and will be stored in the blockchain the date when it is done and what was the answer. Later checking will be available.

CONCLUSION

This paper has presented an overview of the Blockchain technology as a disruptive technology for smart contracts in real estate industry. This study was designed to evaluate the impact of smart contracting on implementation with the various components. Design of the real estate will determine if and when Blockchain can be used in their company as a technology. For the adoption of Blockchain into the organization, it is important to meet certain requirements in order to improve the efficiency of the current processes (Torres, Brann, 2019). The benefits of using smart contract in blockchain technology for real estate industry are as follows:

Different parties can modify database: In the real estate ecosystem, multiple parties such as owners, tenants, and financial management (FM) operators involve the management of real estate properties. They have the right of access in modifying variety of information with the Blockchain technology. This eliminates the modification between the parties.

Trustless among entities and parties: During the development of the real estate, many individuals may not have business relationships beforehand. And this may increase the loss of trust.

Advantage of Disintermediation: With the Blockchain technology, trusted intermediaries such as notary and brokers are not needed, as the transactions can be automatically checked and validated.

Transactions advantage: In real estate companies, different transactions related to different parties (such as landlords, tenants and FM services) are part of the same database. The

real estate companies face difficulties to separate the number of invoices. With the Blockchain technology, we can separate transactions between the parties seeking to improve the efficiency of the invoicing process. As an example, in the net rent lease structure, the tenant pays the facility services (such as cooling and maintenance services) directly to the FM companies and the base rent amount directly to the landlord. Such an approach can also be implemented in the framework of the electronicisation and digitisation of public administration.

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GREEN HUMAN RESOURCE MANAGEMENT PRACTICES IN THE CONTEXT OF SUSTAINABLE BUSINESS DEVELOPMENT

Katarína KRÁĽOVÁ

Abstract

Human resource management suggests that organizations that want to attract and in the future retain quality human resources for business with the goal of sustainable development must change the prevailing situation, especially now that human resources are consumed rather than developed. At the same time, green management of human resources was recently introduced as a response to changes at the social, economic and especially environmental level of the labor market and employment relations. Green human resources management is understood as an extension of strategic human resources management and represents a new approach to people management with a focus on long-term development, regeneration and renewal of human resources in the context of sustainable business development. However, the attributes of green HRM compared to mainstream HRM are not yet completely clear and precise. The contribution aims to fill this gap by proposing and revealing the characteristics of green human resource management and their impact and influence on business sustainability, as well as the possibilities of integrating green human resource management practices into businesses.

INTRODUCTION

Today's time is characterized by an increased interest in environmental problems. One of the reasons is the growing scientific knowledge of how human activities affect the environment. Worldwide interest in environmentalism resulted from specific treaties on combating climate change, e.g. Kyoto 1997, Bali 2007, Copenhagen 2009 (Victor, 2011) Thanks to the media and social networks, today's public is sufficiently informed about climate change, environmental pollution and other environmental problems that pose serious threats to humanity. This increased interest in environmental problems is manifested in all areas of economic and social life. Many governments have taken measures to reduce the impact of human activities on the environment (changing policies, changing legislation, etc.). The increasing interest in environmental problems is a sign that humanity is beginning to realize the seriousness of these problems and is willing to act for their solution. The number of people involved in environmental activism is increasing. People, as well as business entities, realize that the environment is important for their own health and economic well-being. Therefore, business entities today are forced to solve environmental problems in addition to economic problems. To achieve success and sustainable development in business, organizations must focus sufficiently not only on economic and financial factors, but also on social and especially environmental ones (Daily et al., 2007). These initiatives are proof that the world is starting to move towards a more sustainable future. The concept of sustainable development in the use of natural resources and obtaining benefits from these resources is basically maintaining a balance between strengthening economic, social and environmental factors in space and time. The purpose of this balance is to protect our natural resources for us and for our future generations. Sustainability is something that improves the quality of human life while allowing natural systems to maintain their functions for the future. It is the ability of something to continue to exist over a long period of time. Sustainability is important because it ensures that we will have the ability to use natural resources well into the future. For a business, this means that it should conduct its

business in such a way as to minimize its impact on the environment, promote social justice and contribute to economic development. However, in order for the company to be able to maintain and develop environmental sustainability, it must develop pro-environmental skills and behavior of its employees. In every company, employees play an important role in achieving the company's goals, not only in the economic but also in the ecological field. Businesses around the world are increasingly implementing various pro-environmental initiatives. However, the success of these initiatives implemented at the company level largely depends on the pro-environmental behavior of the company's employees. As such, employee behavior is considered an important factor contributing to corporate environmental performance (Blok et al., 2015) and it also has an impact on the natural environment, financial performance of the business, employee job satisfaction, and also contributes to sustainable business development.

LITERATURE OVERVIEW

Green human resource management is a new and rapidly developing trend in human resource management that focuses on the integration of environmental concepts into all human resource management processes (Mishra, 2017). In the beginning, some scholars linked human resource management with environmental management and called it "ecological human resource management" or "environmental human resource management" (Rewnwick, et al., 2013). However, the term "green human resource management (GHRM)" is already in use today. The goal of GHRM is to achieve the sustainability of the organization through its employees. Green management of human resources is based on three theoretical foundations, namely the theory of sustainable development, which claims that the development of society should be based on a balance between economic, social and environmental aspects, and the theory of responsible business, which claims that companies should they had to account for their impacts on society and the environment and also from the human resource theory which states that people are the most important resource of any organization. (picture no. 1), are the basis of every successful business.

Fig. 1: Three basic theoretical foundations of GHRM
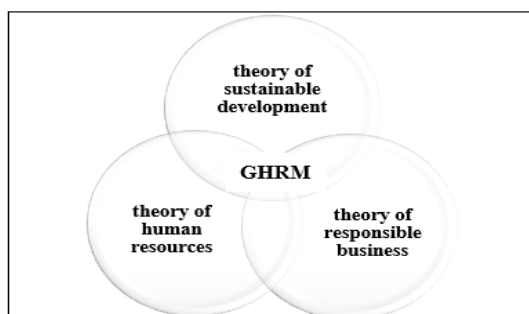
Source: own processing

So what can be imagined under the green management of human resources management? How to understand this new concept of working with human resources in the company? Green human resource management can be defined as a set of activities and policies that aim to reduce the environmental impact of the organization through its employees, support the sustainable development of the organization and its employees, and also increase employee engagement and satisfaction. Thus, GHRM is the use of human resource management policies to promote the sustainable use of resources in businesses and to promote environmental stewardship, which further increases employee morale and satisfaction (Mampra, 2013). According to other authors, GHRM is about the use of such policies, philosophies and practices of human resource management in a company, which aim to promote the sustainable use of

company resources while at the same time trying to thwart any unwanted damage resulting from environmental problems in companies (Ren et al., 2018). Green human resource management is a systematic and planned alignment of typical human resource management practices with the environmental goals of the organization (Jabbour, 2013). Thus, the question arises as to how to use GHRM tools to achieve sustainability in the company. GHRM includes five dimensions: green recruitment and selection, green training, green performance management and development, green compensation and motivation, green engagement.

GOAL AND METHODOLOGY

The growing interest in this topic is evident in foreign professional publications, compared to domestic sources. It is valuable to examine the scientific interest in the field of GHRM in the context of sustainable development. Logically speaking, it is an examination of possible research gaps. It is important to know what has been researched on this topic, so that subsequent logical reasoning reveals opportunities for future research, and at the same time, so that specific research results can also be applied in practice. The aim of our contribution is, based on the previous analysis of data from the literature, to explain the benefits from how individual dimensions of GHRM can be integrated in companies in the context of their efforts for sustainable business development. This work is theoretical. In the first phase of the survey, relevant data from the literature were collected. Using selected keywords, articles from the Web of Science, Scopus, or Google Scholar databases were collected through an online search. The keywords for the search were chosen as follows: sustainability, sustainable development, GHRM, green human resource management practices. After reading the abstracts of the selected articles, irrelevant articles were removed. In the remaining articles, we have explored the "how" and "what" has already been explored in relation to the objective of our paper. Thus, we have examined the research methodology, research results, gaps and research limitations in detail in the articles. On the basis of these facts, we were subsequently able to point out the possible positive benefits or intricacies of the integration

of green human resources management procedures for business entities in the context of sustainable development.

FINDINGS

When organizations set their economic and environmental goals in the context of sustainable development, they must make sure that there is consistency between the company's strategy and the company's human resource development strategy (Ren et al., 2018). It is necessary to understand the nature of environmental behavior at the individual level. The consequence of this was the formation of GHRM, which links environmental management systems and human resource management systems in the company. (Renwick et al., 2013). Given these facts, we decided to examine the integration of the GHRM literature with sustainable business development. We were looking for the benefits of applying green human resources management tools in the company. We found that studies report that GHRM includes five elementary dimensions within which different kinds of green HR tools are applied depending on the specific strategies and goals of businesses. Of course, the integration of these green human resource management practices brings benefits to the business:

- more efficient use of human resources,
- the possibility of standardization of human resource management processes,
- contributes to increased flexibility and adaptability in human resources management,
- can positively improve communication and cooperation
- can contribute to cost reduction,
- better management of talents as key resources for the company,
- reducing risks, improving competition, etc.

Green recruitment and selection of employees

The primary task of this area of GHRM is to attract quality employees to the company. We can state that at present, with the existing current situation on the labor market in Slovakia, it is a key challenge for the field of human resources in the "war for talents". Research shows that some employers, especially large multinational companies (Ehnert, 2009), adopt GHRM practices as a form of "employer branding" in

order to increase their attractiveness on the labor market and thereby attract high-quality, qualified, talented applicants. The environmental reputation and image of the organization are often an important criterion for job applicants. Of course, this is also reflected in the company's recruitment activities, where recruiters try to provide much more information and details about their environmental activities. The recruitment websites of major European employers provide considerable detail about the environmental activities of the organization (Ehnert, 2009). Many studies and surveys conducted in the USA, the UK, Japan and other countries agree that if a company has a good environmental reputation, it is able to attract quality employees (Behrend, et al., 2009, Backhaus et al. ., 2002, Ehnert, 2009). So, within the framework of GHRM, the traditional functions of recruitment and selection in the organization, which are primarily focused only on selecting a suitable candidate who meets the requirements of the job, are complemented by other aspects of recruitment and selection that focus on the environmental skills and knowledge of the candidates (Ahmad , 2015, Andjarwati et al., 2019, Nisar et al., 2021, Renwick et al., 2013). Among the main attributes of ecological recruitment and selection within the framework of GHRM, we can include, for example:

- hiring candidates with environmental knowledge and awareness (Jabbour, 2011; Ahmad, 2015; Masri and Jaaron, 2017; Tang et al., 2018),
- building a green brand to attract ecological employees (Ren et al., 2018); prioritizing candidates who choose green criteria to shortlist organizations (Ren et al., 2018),
- familiarizing candidates with the environmental goals of organizations during the
 recruitment process (Mandip, 2012; Renwick et al., 2013); the use of online tools such as video conferencing in recruitment (Nasruddin, 2015; Masri and Jaaron, 2017).

Green employee training

Training, education of employees is generally perceived in the literature as a key competence of GHRM. Why? Because training is a means to help employees acquire the necessary skills that help improve their knowledge and help them be innovative. However, with growing concerns about the environment, organizations are more inclined to provide environmental training to their employees. Green trainings are mainly aimed at increasing employees' awareness of the impact of their organization's activities on the environment. Green training leads to employees being equipped with key skills and data that allow increasing the level of "eco-literacy" and environmental expertise in the company (Roy, Therin, 2008). Green training encourages employees to acquire certain skills to address the environmental problems of organizations and focus on environmental improvements, thereby meeting the goals of the organization (Jabbour, 2011; Tang et al., 2018). Green training is the most significant method through which GHRM can achieve the environmental goals of organizations and help the organization move towards more sustainable development (Teixeira et al., 2016; Jabbour, 2013). Well-trained and environmentally conscious front-line employees are ideally placed to identify and reduce waste, as they are closest to it, and this is naturally associated with lower costs. The main attributes of green education and employee development are, for example:

- providing all training materials online to reduce paper costs (Masri and Jaaron,2017),
- special training for waste management - waste management and recycling (Renwick et al., 2013; Jabbour, 2013),
- involvement of employees in solving environmental problems,
- job rotation within ecological tasks (Arulrajah et al., 2016).

Green performance management and employee development

Green performance management and company employee development means integrating environmental sustainability and social responsibility into performance management processes. This approach reflects the fact that businesses have a responsibility to operate in an environmentally conscious and socially responsible manner. Here are some ways to incorporate green performance management into evaluating and improving employee performance:

- determine key performance indicators that measure employees' contribution to sustainability, e.g. energy savings, waste reduction, waste reduction or participation in volunteer activities,

- include environmental or sustainability-related goals in employee performance goals, e.g. reducing the consumption of resources, minimizing waste or implementing sustainable practices in the performance of their work,

- integrate environmental metrics into the employee performance evaluation process, e.g. evaluate the impact of employee actions on the company's carbon footprint, energy consumption or other relevant environmental factors,

- encourage employees to come up with eco-innovative ideas to improve the company's environmental behavior.

Green remuneration and motivation of employees

The green reward and reward system is a means of motivating employees to work towards the organization's environmental goals through financial and non-financial rewards. It is also an attempt to prevent talented employees from leaving the organization and also to attract new employees who know green practices (Jabbour et al., 2008, Mandip, 2012). Modern organizations adopt the practice of strategically rewarding employees who work to achieve the organization's environmental goals (Ahmad, 2015). Constantly rewarding employees for their eco-initiatives keeps them motivated and oriented towards environmental practices (Daily and Huang, 2001, Renwick et al., 2013). Research also suggests that green performance appraisal and compensation play a vital role in motivating employees to commit to green behavior in the workplace (Alabdullah et al., 2019, Roscoe et al., 2019, Rasool et al., 2019), which also it also helps to improve the economic performance of the organization and contributes to sustainable development. In any case, researchers agree that the right combination of monetary and non-monetary rewards is highly effective in motivating employees. While it would be more appropriate to motivate with non-financial rewards through green remuneration such as praise, recognition or other non-financial

rewards such as sustainable travel - green travel benefits for employees (Ramus, 2001, Renwick et al., 2013, Jabbar and Abid, 2014, Ren et al. , 2018), ecological tax incentives (Ramus, 2001, Jabbour et al., 2008, Arulrajah et al., 2016, Tang et al., 2018), support of volunteer activities and projects, use of less polluting vehicle fleet (Ahmad, S. 2015) and so on. And ultimately, the integration of green behavior into corporate reward and incentive systems, e.g. green profit sharing, green employee of the month/year and a lump sum based on ecological performance will also improve employees' perception of the fairness of these systems. (Ababneh, 2021).

Green involvement of employees

Involvement of employees in the development of environmental initiatives and decision-making on environmental goals will support their involvement in environmental initiatives. Establishing two-way communication that emphasizes the need to advance the organization's environmental performance will increase employees' awareness of how important their contribution is (Jabbour et al., 2013; Renwick et al., 2013). Furthermore, creating opportunities for employees to participate and collaborate in setting environmental activities and goals will promote their psychological and emotional attachment to and identification with these goals (Pinzone et al., 2016; Roscoe et al., 2019). Also, the establishment of formal and informal communication channels that clarify the green values and intentions of the organization and support the involvement of employees in decision-making on environmental issues will stimulate employees to participate more actively in environmental initiatives and encourage them to exchange knowledge with colleagues, adopt eco-initiatives and adopted innovative methods in solving various environmental problems. Company employees strive to achieve environmental goals when they positively assess and perceive the meaningfulness between the performance of their task and these well-defined goals (Grobelna, 2019). Active participation of employees in decision-making on environmental issues will, among other things, strengthen their emotional attachment to organizational values and principles. Thus, employees exert a high level of enthusiasm and energy in dealing with

sustainability-related matters (Pinzone et al., 2016).

DISCUSSION

Business sustainability is defined as a business strategy that drives long-term growth and profitability of a company by mandating the inclusion of environmental and social issues in the business model (Niţă and Ştefea, 2014). Business sustainability based on achieving a balance between economic, environmental and social business activities is the goal of the overall strategy of socially responsible business. Green human resource management is characterized by trying to align typical human resource management practices with the environmental goals of organizations. (Jabbour, 2013). So here we have an intersection where GHRM meets sustainability in organizations as green HRM practices that deal with

environmental aspects seep into CSR strategies through HRM. However, many questions arise as to how big this penetration should be and to what extent the individual dimensions of GHRM can support the sustainable development of business, etc. Then, of course, there is a need to examine the impact of green human resource management practices on the performance dimensions of sustainability within CSR strategies. According to the literature, green human resource management is key to achieving sustainability programs and helps gain competitive advantage. However, activities with a green focus in practice are challenging because they require implementing systemic changes, which of course requires time and money. The implementation of these systemic measures helps organizations in adopting green human resource management practices, which become a unique, irreplaceable and valuable resource.

Fig. 2: Interrelationship between human resources, innovation and sustainable development.
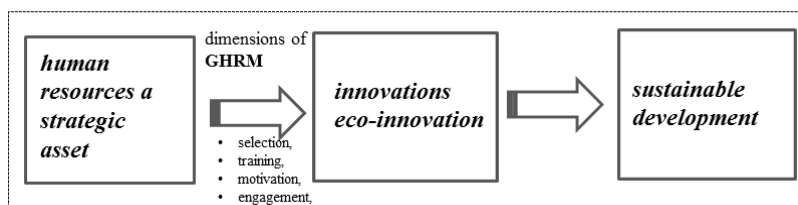
Source: own processing

So what are the benefits of GHRM for organizations that decide to implement green human resource management practices in relation to sustainable development? The benefit is quality (qualified, talented, motivated...) employees with added value in the form of pro-environmental behavior. Qualified employees are the bearers of new innovative ideas, which are an added value for the company, and this is of course reflected in economic results. And what is the prerequisite for sustainable development in a company in the context of socially responsible business? They are innovations, more precisely eco-innovations. Why? Because the application of innovation within the entire organization can achieve sustainability, social responsibility, competitive advantage and that only under the assumption of

continuous learning and development (Haden et al., 2009). And we are dealing with the human resources of the company, because the basis of innovation is an idea, an idea, and its bearer is an employee. And hence the task for GHRM to acquire employees who have the necessary skills, knowledge and experience to contribute to the creation and implementation of ideas and innovations. Many studies have found that GHRM positively affects individual environmental behavior, however, it remains difficult to assess which specific GHRM practices have the ability to influence employees' environmental behavior, which may be the subject of further investigation. For example, employees engage in environmental initiatives when they receive well-designed training programs that support the organization's culture

and sustainability goals and that improve employees' ability to solve environmental issues (Roscoe et al., 2019). This means for the company that it is therefore necessary to design and compile quality training programs that address a wide range of environmental issues (e.g. emission reduction, energy and water consumption, waste management, green purchasing procedures and options...). When creating training programs, GHRMs also need to keep in mind that individual employees may suffer from being hindered by emotional and cognitive job demands due to a lack of knowledge and awareness. Therefore, organizing well-designed GHRM trainings will contribute to enhancing the capabilities and environmental skills of employees and creating a good work environment that supports performance. And as it was already mentioned above, people are the bearers and creators of innovations as a source of future development (sustainable development), so the dimension of recruitment and selection of employees is one of the key tasks of GHRM in organizations. Many studies have confirmed that ultimately, hiring employees who have knowledge, experience, and environmental values and attitudes that are consistent with the organization's environmental policy, systems, values, and goals are most likely to engage in the organization's environmental initiatives and create eco-innovations. (Dumont et al., 2017). But the tasks of GHRM do not end at the moment of selecting a suitable employee and training him. It is necessary to continue working with employees in the company. And here a new space opens for GHRM, where it is necessary to use all previous knowledge and results of studies on how to motivate employees and how to reward them fairly. Because for employees, in many cases, the issue of remuneration and motivation is a key element that decides whether to stay at work or not. Thus, a properly designed and implemented green reward system that employees perceive as fair can motivate employees to improve their performance and job satisfaction, and also motivate them to engage in sustainable and environmentally friendly behavior in and out of the work environment. It is important that organizations have a balanced approach to compensation, and that green compensation programs take into account the individual needs and preferences of employees. Some companies implement green human resource management practices that are aimed at supporting sustainable behavior and environmental initiatives in the corporate environment as part of their corporate social responsibility and thereby promote environmentally sustainable values. So, based on the studied materials, we can say that all dimensions of GHRM contribute to the development of the organization in the context of the principles of sustainability and social responsibility of business, even if there are still many unanswered questions that will need to be answered in the future through further studies.

CONCLUSION

The aim of the paper was to point out that GHRM is a solid part of the organization that contributes to increasing performance in the area of sustainability and how the individual dimensions of GHRM are able to contribute to the sustainable development of the company in the case of their integration in the company. Businesses should be able to involve the workforce in forming connections between pro-environmental practices and pro-environmental impacts. Thus, the role of the green HRM process can be concluded that, as part of socially responsible business management, it is a resource that tends to assist organizations in adopting green HRM practices that act as an organization's ability to contribute to the growth of sustainable development. And in conclusion, we can also state that the integration of green human resource management practices can have a significant impact on the economic performance of the company, the growth of the company's competitiveness in a globalized environment.

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DESIGN OF A STRATEGIC DEVELOPMENT PLAN FOR THE URAGA HARDWARE STORE IN EMPALME, SONORA

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Abstract

The investigation that was carried out on the company Ferretería URAGA, located in the city of Empalme, Sonora, Mexico, this company does not usually plan its development. It is therefore necessary to make a proposal for a strategic plan that provides said company with a direction that benefits the organization at the administrative, commercial, environmental and other aspects that are related to the company, and allows its development and competitiveness. The objective of this work is to design a strategic plan, for which it is of great importance to carry out a diagnosis of the current situation of the organization, which allows having a vision for the future, taking into account the requirements and needs of the market. The research is descriptive, purposeful, non-experimental, since its scope is to list or describe the possible strategies for its growth. Primary and secondary sources were used. It culminated in the formulation of strategies designed for the company.

INTRODUCTION

The importance of Small and Medium Industries (SMEs) in the economy of different countries has been recognized and evident for a long time, especially in Latin American countries. It is also evident that under current conditions, SMEs face the challenge of being able to develop strategies that allow them to integrate into a globalized and highly competitive market.

The company under study is called Ferretería URAGA, in the city of Empalme, Sonora. Registered with the federal taxpayer registry as an SME, dedicated to the sale of retail hardware products in general.

Committed to being a company focused on service and seeking customer satisfaction, hoping to remain in the community's preference, Ferretería URAGA oriented its direction to be the solution in the supply of fishing products to the splicing community . , in addition to offering a variety of product lines for the general customer.

One of the causes of the lack of strategic planning, which becomes an obstacle to its implementation, is the lack of knowledge about this tool (Saavedra, 2021).

Furthermore, because we want to improve, constant monitoring of key indicators must be carried out within the implementation and execution of the plan, since if there is a deviation, decisions must be made to lead the organization to meet its objectives Peñafiel - Loor et al., 2019)

The purpose of this work is to design an improvement plan in the weakest areas of the business; For which it is of great importance to have an efficient diagnosis that allows us to meet customer requirements. In addition, a strategic plan must be made to offer functional solutions adjusted to the specific needs of the hardware store that allow adequate management and control of inventories.

1.1 Problem statement

At the URAGA hardware store, situations have been occurring that have affected the company, such as: Low sales, insufficient space for product storage, little product diversity, long customer service times, company disorganization, among others; which results in poor customer service, what will be the actions (strategies) to follow to change the development, growth and competitiveness of the company?

1.2 Objective

Design a strategic development plan that allows meeting the needs of the business, through the analysis of the company and the application of statistical instruments, to improve its current situation and consequently increase profits.

1.3 Theoretical justification

URAGA Hardware is a family project that has never had any type of advice in the administrative and labor sphere, which is reflected in the absence of management skills for adequate administration; Therefore, it is important to highlight that it is possible to transform this family idea into a productive and safe company by having the bases to plan, verify and act on its transformation, for its development and to be more competitive in the market.
Corporate strategic planning is not only about establishing a joint plan for the actions and resources required to fulfill it: it also merits evaluating the process. The evaluation allows us to detect execution errors that can be corrected in time to prevent losses of time and money" (Mejia , 2021).

In order to propose an administrative solution to the URAGA Hardware Store and according to the information collected through different media, a strategic plan will be made to serve as support to solve the different problems that the family business presents, which if implemented and Follow-up, it is expected to consolidate URAGA as the first solution that customers have when choosing a hardware store among the competition, to provide solutions to their supply needs for quality hardware products, with first-class attention and service.

The main objective of the Diagnosis is to analyze the current state of maturity of the organization with the national or international standards that the company must manage, which allows it to reach the desired situation (its business vision), identifying quickly, accurately and concise the potentials. development areas.

Due to the great competition in the market and the reduction in sales, there is a need to implement strategies that allow minimizing weaknesses and eliminating threats in the company, as well as maximizing strengths and taking advantage of opportunities in the environment to excel in the current environment. . hardware store market.

The literature recognizes the importance of SMEs in any economy, however, it does not take much into account their particular characteristics in relation to strategic planning (Mora- Riapira , Vera-Colina, & Melgarejo-Molina, 2015), which makes each organization have its very particular strategic planning.

1.4 Methodological justification

The purpose of carrying out this project is to design a strategic plan for the URAGA Hardware store in the areas with the greatest problems, in order to know the current situation in which it is located and that can generate a significant impact on the success of its application, with which seeks to establish the strategies and mechanisms to be used to apply the action plans corresponding to each work area. This project will allow solutions in strategic direction, logistics, organizational structure in terms of mission, vision and defined corporate values, with truthful information that allows projections to be made that guarantee the sustainability of the company with logistics strategies for inventories, storage, customer service. customer. service to achieve satisfied customers due to variety of products, quality and good service.

The sources that will be used are: Primary; surveys, interviews, workplace observation. Institute; Textbooks, internet, information related to hardware stores.

Due to the great competition in the market and the reduction in sales, there is a need to implement strategies that allow minimizing weaknesses and eliminating threats in the company, as well as maximizing strengths and taking advantage of opportunities in the environment to excel in the current environment. . hardware store market.

LITERATURE REVIEW

One of the most widespread applications of organizational analysis is that which refers to organizational development, in this case it is a process of planned change of the organization, for which it is necessary, first of all, to know the situation it is going through. the company to then evaluate the results of the proposed and

implemented changes. The analysis carried out to evaluate the situation of the company, its problems, potential and possible development paths is called organizational diagnosis.

It is important to have strategies that help compete with different companies in different markets, seeking the general development of a company, obtaining a competitive advantage that exceeds the performance of competitors, which is then where it is necessary to carry out an organizational analysis. Diagnosis that allows us to analyze the strengths and weaknesses of the organization and the competition to develop strategies that allow us to differentiate ourselves from it Mejía (2021).

To achieve the objective or purpose, an outline of the most relevant aspects that are managed there must be made, which will be developed through Strategic Administration; Theory that we have considered most appropriate to carry out this project.

2.1 Structure and organization of small businesses.

In most cases, small businesses appear closely linked to the human and economic figure of their promoter or group of promoters. He, or they, are the ones who give it its own character and set the course to follow according to their own desires. As the company acquires a certain importance, its activities multiply and the need to have qualified professionals begins to be felt to be able to successfully handle the complicated business management.

Decision making in every company is linked to the assumption of responsibilities, almost always accompanied by complex situations of risk and uncertainty.

The small businessman will coordinate the different productive factors available to him to try to obtain maximum performance by offering a series of goods or services to the community. The coverage of the needs provided by demand must be established based on a supply that attempts to maximize factor productivity.

2.2 Financial activity and financial structure of the SME

In companies we find two streams of money derived from their production cycle:

a) Outflow of funds, as a consequence of the payment of salaries and the acquisition of goods and services.
b) Inflow of funds, through own contributions and as a consequence of sales collection.

The company's financial activity focuses on the programming, and the corresponding control, of these two money flows.

In small businesses, the promoter-entrepreneur will be directly responsible for these activities. As the company increases in size, it will be advisable to have the services of a specialized financial director.

The financial function will be present in each and every one of the company's activities: purchases, production, sales, investments, storage and obtaining results. The development of these activities will have specific financial consequences that will determine the future of the organization.

Finances, a very important aspect to consider in small businesses.

Long-term loans are usually more expensive for small businesses than for large ones, mainly because of the less security and guarantees they offer. Official credit institutions and financial companies usually place fewer obstacles than banks when granting this type of credit to SMEs. (Maqueda Lafuente, 1992).

2.3 Strategic planning.

Strategic planning should be understood as a participatory process, which will not resolve uncertainties, but will allow us to draw a line of purposes to act accordingly. The conviction that the desired future is possible allows the construction of a community of interests among all those involved in the change process, which turns out to be a basic requirement to achieve the proposed goals. (Prescott-Allen, Aguilera, & Chirinos, 2002)

2.4 Strategic plan

The strategic plan is a program of action that consists of clarifying what we intend to achieve and how we intend to achieve it. This programming is reflected in a consensus document where we specify the main decisions that will guide our progress towards excellent management. (Quality Guide, 2016)

2.5 SWOT Analysis

SWOT analysis is a strategic planning tool that you can use to identify and evaluate an organization's strengths and weaknesses (internal factors), as well as opportunities and threats (external factors). It is a simple technique, which can be used as a tool for the free exchange of ideas to help present an overview of the current situation. The process of conducting a SWOT analysis helps to achieve a common understanding of "reality" among a group of people in a given organization. In this way, it is easier to understand and identify key capacity development objectives and needs, as well as possible solutions (Boutrif , 20017).

2.9 Strategic management

Strategic management is the art and science of formulating, implementing and evaluating cross-functional decisions that allow the organization to achieve its objectives. This involves integrating management, marketing, finance and accounting, production and operations, research and development, and computerized information systems for organizational success.

GOAL AND METHODOLOGY

3.1 Type of research

It is a descriptive analytical research, since we limit ourselves to pointing out the Strengths, Opportunities, Weaknesses and threats, and then describing strategic actions that are suggested for the development of the hardware store.

3.2 Information collection

Information is collected that allows us to explain or learn about events and processes carried out in the company.

On the one hand, primary sources were used, which were integrated by the largest source of information that is the object of study of this formulation, which is the organization, which are the people who are part of the company (8 employees and Mr. . .owner), on the other hand, customers are an important source of information. The main source that has been used to collect information to carry out this work was the Interview and the Survey.

On the other hand, secondary sources were used such as books that contain information on the strategic plans of various authors that are mentioned in the research work, books on strategic planning, research methodology.

3.3 The interview

Here information is collected verbally through previously designed forms, in our case it was in person.

3.4 Survey

The survey is also carried out through previously designed forms, with questions about the information we want to know, about the knowledge, attitudes, motivations and opinions of the workers on the topic we want to know.

3.5 Techniques and instruments

This research used the following techniques and instruments in order to quantitatively analyze the real situation of the company through the following:

- In-depth interviews in the workplace.
- Questionnaires.
- Notes and observations.
- Document analysis.
- Step-by-step   script when asking questions.
- Concept of strategic thinking analyzing Porter's five forces model .
- Data collection matrices such as EFE, EFI, MPC, IE, SWOT LUCEM method, SWOT matrix, strategic matrix, strategy table and quantitative strategic planning matrix.

FINDINGS

Vision

To be a leading company in the sale of fishing materials and hardware in general, exceeding the quality and service expectations of our customers, thanks to the unconditional support of a committed work team, allowing us to maintain a high degree of social and commercial commitment. responsibility that guarantees us financial solidity and sustainable growth.

Mission

To be a company that works to provide its clients with the greatest diversity in fishing materials and hardware in general, recognized for meeting the price, quality and service in accordance with market demands, committed to the constant training of our human resources, to that is highly qualified, productive and committed to maintaining the preference and satisfaction of our clients.

Vision values

Integrity - Transmit a kind, honest and trustworthy treatment.
Commitment - Committed to continuous improvement, always seeking better prices and services.
Responsibility - Oriented towards the satisfaction of our customers, with products at a fair price and quality.

SWOT Analysis

Lucem methodology was used . Below is a part of the instrument used to weigh the relevance of each factor.

Tab. 1: SWOT analysis factors

INTERNAL FACTORS	Assessment					Weighing			
variables	No correspc	Muy desfavor	Desfavor	Favorabl	Muy favor	Muy insignific	Insignific	Significant	Muy Signific
Human Resources process activities									
1. Attention. - It is considered favorable if the service provided meets the customer's expectations.				3	12			1	14
2.Response time. - It is considered favorable if the time assigned to attend to a request is as expected by the client.			7	8			1	1	13
3. Training. - It is considered favorable if the staff has the necessary training to carry out their activities.				1	14			6	9
4. Advice. - It is considered favorable if advice is provided regarding the products offered by the company.					15			1	14
Process Activities Technology									
5. Use of technology. - It is considered as favorable if the use of technologies is used in the operations of the company.			1	9	5	4	9	2	
6. Software. - It is considered favorable if specialized software is used to control the operations of the company.			1	10	4		6	8	1

Source: Own elaboration, 2020

This formulary; It refers to the evaluation and weighting of each variable. The form first presents the internal aspect, strengths and weaknesses, and then the external aspect, opportunities and threats. In turn, each of these factors is subdivided, creating the effects of a logical guide to follow. Regarding internal factors, the general guidelines of the Lucem diagram are followed, a way of structuring the company according to process, support and management activities. Under each variable in the model (for example Logistics). You will see a series of questions related to that variable that you must answer and reflect on. Two important concepts to keep in mind are responses and weightings. The first aspect is the specific answer to the question posed). The second aspect, weighting, is the relative importance that you consider the factor being requested to have for the organization. Both elements are important in the response and cannot be avoided.

The response aims to describe the situation, the weighting is an indicator of the strength that this situation represents in the company and how it affects it. This aspect should not be underestimated, in some way it is a way of expressing the entrepreneur's way of thinking. For example, knowledge of the competition may be unfavorable and the factor may be considered very significant, which clearly indicates that it is a weakness that the company is aware of and that it is very important for the company to try to solve it. There may be particular factors that do not apply to the company.

Below is the list of the factors of the SWOT analysis of URAGA Hardware Store. Table 2 lists, ordered and assigned, the SWOT factor corresponding to each Strength, Opportunity, Weakness and opportunity found, according to the methodology used for it.

Tab. 2: Factors found in the SWOT analysis

Strengths	T1	Personnel dedicated to the company's activities.
	T2	Trained and experienced personnel in the field.
	T3	The company uses effective sales and inventory management software.
	T4	Sole supplier of fishing implements in Empalme.
	T5	Location of the company (Near the fishing sector).
	T6	Prices that allow you to compete in the market.
Weaknesses	W1	There is no strategic plan.
	W2	Little variety of brands in items.
	W3	Few staff for attention.
	W4	Little assortment of products for sale.
	W5	There are no defined written procedures. (sales, purchases, inventories and warehouse management)
	W6	There is no defined procedure for supplier management.
	W7	There is no optimal company distribution.
	W8	There is no quality evaluation system.
	W9	Not all of the company's land is used.
	W10	There is no home delivery service.
	W11	Little counter space for customer service.
	W12	Advertising is not handled in media such as newspapers, radio and television.
	W13	There is no warehouse for the protection of construction materials for sale.
Opportunities	O1	Increase in sales due to job creation in construction companies
	O2	Increase in potential clients for companies about to set up shop (CFE, port,
	O3	Growth due to the closure of other hardware stores in the community

	O4	Opening of credits by the government for the growth of SMEs
	O5	Affiliation as a supplier to INFONAVIT accredited in the improve your home program
	O6	Move image by web page and social networks
Threats	T1	Prohibition of fishery products
	T2	Increase in prices of supplier products.
	T3	Buy in larger quantities from competitors, winning the market for better
	T4	Arrival of another supplier of fishing implements to Empalme.
	T 5	Variation of the peso against the dollar.
	T6	Seasonal sales, not certain.
	T7	Substitution of fishing activity for other productive activities.
	T8	Low sales due to the fall in gross domestic product.

Source: Own elaboration, 2020.

Strategies

Table 3 specifies the relationships between strengths, weaknesses, opportunities and threats, which must necessarily be done to have a greater impact with the strategy and above all not to duplicate efforts, and each one is given its number of strategies and their description.

Tab. 3: Strategy development

	Relationship	Strategy	Description
WAS (WEIGHT)	W1-T1T2-T3-T4-T5-T6	E1	Design a strategic plan to adapt the hardware store's products and activities according to customer needs.
	W6-T3-T4	ES2	Develop a procedure for supplier management that allows us better options to have competitive prices in the market.
	W6-W2-T5	ES3	Use suppliers that handle national products.
	W13-T1-T6	T4	Generate a seasonal sales product that contrasts with times of low sales.
WAS (WO)	W8-O1-02	ER1	Know the status of the company before customers, carrying out an evaluation of the perception of the quality of the service.
	W1-W5-W6-W7-O1-O2-O3-O4-O5	ER2	Create an annual planning review process that allows the company to provide security to customers and increase possibilities for growth.
	W7-W13-O1-O2-O3-O4	ER3	Carry out a redistribution of the company in search of possible growth and use of spaces.
	W2-W4-O1-O2	ER4	Expand catalog of suppliers and products
WAS (STREET)	T4-T1	ED1	Diversify products to capture the largest market, and minimize the impact of the closure period, as well as the impact of the possible arrival of new competitors.
	T4-T4	ED2	Expand the variety of fishing implements.
	T4-T6	ED3	Offer construction products such as cement, mortar, block, brick, rod, armex , among others.
	T5-T4	ED4	Greater advertising of the sector's fishing products.
	T6-T2-T3-T4	ED5	Find new suppliers that offer better prices or credits, which allow the hardware store to lower the price of its products to the consumer.

	T4-T4	ED6	Create alliances with fishing suppliers to introduce new products at affordable prices.
	T1-T7-S4-S5-S6	ED7	Generate offers and promotions on fishing implements out of season to increase sales.
WAS (SO)	T1-S2-O6	EO1	Make a marketing plan and generate advertising through the web, such as Facebook, YouTube, etc.
	S4-O1-O2-O3	EO2	Greater offer of fishing implement products to companies and consumers in the fishing sector.
	T5-O1-O2-O3	EO3	Advertising products in the store and taking advantage of the location close to the fishing sector.
	T6-O4	EO4	Provide credits for the purchase of products to small and medium-sized businesses.
	T6-O5	EO5	Offer product sales service through the MEJORAVIT program.
	T4-O1-O2	EO6	Offer online service for the sale and delivery or receipt of products.

Source: Own elaboration 2020.

Table 4 lists the priority of the plans, with their respective objectives, goals and measurables, essential for feedback, defines the strategy and formula of the indicator and the percentage of the goal, and above all the perspective to whom it is directed.

Tab. 4: Plans, objective, goals, measurables, type of measurables

#	Goals	Perspective	#	Strategy	#	Indicators	Boy	Formula	Goal
1	Search for alternatives and improve company processes company to ensure its permanence in the market	client and Market	1	Design a strategic plan to adapt the hardware store's products and activities according to customer needs.	1	% Satisfied Customer	Effectiveness	(Satisfied customer / Total customers served *100)	90%
		client and Market	2	Know the status of the company before customers, carrying out an evaluation of the perception of the quality of the service.					
		Internal processes	3	Create alliances with fishing					

				suppliers to introduce new products at affordable prices.					
2	Implement strategies to increase company sales	Financial and Social	4	Develop procedure for management. of suppliers that allows us better options to have competitive prices in the market.	2	% of sales	Effectiveness	(semi-annual sale / previous semester sale *100)	10%
		Financial and Social	5	Generate a seasonal sales product that contrasts with times of low sales.					
		client and Market	6	Greater advertising of the sector's fishing products.					
		Financial and Social	7	Generate offers and promotions on fishing implements out of season to increase sales.					
		Learning and growth	8	Expand the variety of fishing implements.					
		Learning and growth	9	Advertising products in the store and taking advantage of the location close to the fishing sector.					
3	Implement strategies to increase	Internal processes	10	Use suppliers that handle national products.	3	% Clients increasing	Effectiveness	(Current semester clients /	5%

business clients							Clients previous semester *100)		
	Learning and growth	eleven	Carry out a redistribution of the company in search of possible growth and use of spaces.						
	Internal processes	12	Expand catalog of suppliers and products						
	Internal processes	13	Diversify products to capture the largest market and minimize the impact of the closed period, in addition such as the impact of the possible arrival of new competitors.						
	Learning and growth	14	Offer construction products such as cement, mortar, block, brick, rod, armex , among others.						
	client and Market	fifteen	Make a marketing plan and generate advertising through the web, such as Facebook, YouTube, etc.						
	client and Market	sixteen	Greater offer of fishing implement products to						

				companies and consumers in the fishing sector.					
		client and Market	17	Provide credits for the purchase of products to small and medium-sized businesses.					
		client and Market	18	Offer product sales service through the MEJORAVIT program.					
		client and Market	19	Offer online service for sale. and deliv ery or receipt of the products.					
4	Search for alternatives and improve company processes to generate profits and increase the company's profit.	Internal processes	twenty	Create an annual planning review process that allows the company to provide security to customers and increase possibilities for growth.	4	semiann ual benefit	Efficiency	(Profit from the current semester / Profit from the previous semester *100)	10%
		Financial and Social	twenty-one	Search for new suppliers offer better prices or credits, which allow the hardware store to lower the price of its products					

				to the consumer.					

Source: Own elaboration, 2020.

Fig. 1: Proposed organizational chart
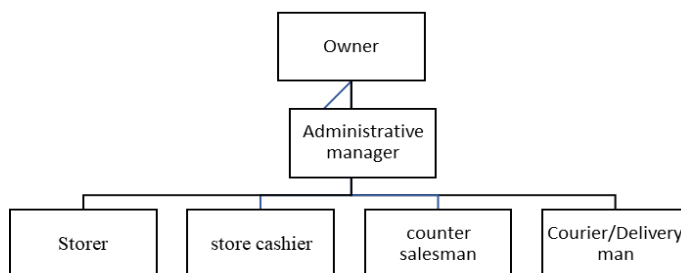
Source: Own elaboration, 2020.

This Organization Chart is a graphic representation of the company's organizational structure and shows the dependency relationships between the different roles within the group. It is a small organizational chart since it is a small company.

Description of activities:
− Owner: responsible for monitoring the company's activities.
− Administrative: Responsible for monitoring and monitoring deposit activities, sales, purchases, supplier selection, payment of services, home deliveries, among others.
− Storekeeper: responsible for the protection, organization and cleaning of the products for sale.
− Seller: sales manager. at the counter, advice on equipment and products,
− cashier: cashier at the end of the shift.
− Courier/Delivery Person: responsible for the home delivery of products, as well as transportation of documents, visits to suppliers, among other activities where transportation is required.

ANALYSIS AND DISCUSSION

To implement the proposed strategic development plan, it is necessary to make changes to the infrastructure, internal processes, as well as human resources, which imply an additional cost to what was budgeted by the hardware store; It is worth mentioning that resistance to change and uncertainty on the part of the hardware store representative about the viability of implementing the designed proposal is the main difficulty faced.

It is important to train the business representative and convince him of the importance of making improvements in the hardware store, improvements that will translate into the survival of the business in the hardware market.

CONCLUSIONS

The objective of designing a strategic development plan that allows a considerable improvement in the processes of the URAGA Hardware Store was satisfactorily met, which promises to increase the usefulness of the URAGA Hardware Store by making the proposed modifications to it.

Resistance to change is the main difficulty that the company will face in applying the proposal that was made, as well as the uncertainty and lack of knowledge necessary for the use of technologies and application of tools necessary for the proper functioning of the strategic development plan . .

After collecting the information and obtaining the resulting strategic development plan of the project, the effort made by the team, as well as by the hardware store staff with whom

we worked together to complete the project is

satisfactory.

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INNOVATIVE ACTIVITIES OF SMALL AND MEDIUM-SIZED ENTERPRISES WITH A FOCUS ON THE NEED AND USE OF HUMAN RESOURCES

Jana Sochuľáková

Abstract

Recently, we have been increasingly encountering terms such as turbulent environment, dynamic environment, unstable environment, and businesses must be prepared to respond flexibly to challenges arising from such an environment. The competitiveness of companies depends more and more on the rapid adaptation to ongoing changes. The sources of basic competitive advantages are efficiency, quality, innovation, full understanding, and sensitivity to customer requirements. The main driving force behind innovation is adequate research and development. Research and development represent one of the steps towards innovation and the innovative activity of companies. The aim of the paper is to evaluate the innovative activity of small and medium-sized enterprises in the Slovak Republic as the basis of the company's competitive advantage based on selected indicators. Subsequently, we will analyze and evaluate the use of human resources within the innovative activities of the company and in research and development in individual regions of the Slovak Republic.

Key words:
innovation activity, employees, human resources, small and medium-sized enterprises

INTRODUCTION

In the period of worldwide growing globalization and digitization, innovations are becoming an increasingly important factor determining the success of business activity. They provide companies with higher growth, increase efficiency, competitiveness and enable companies to create new markets. (SBA, 2020) In order for businesses to survive in today's global market economy and achieve long-term success, it is important for businesses to be able to adapt and continuously innovate to overcome intense competition and adapt to changing market demands (Al Ansari, 2014). In the field of innovation, companies encounter a lack of initial ideas important for the creation of innovation or also a lack of financial resources. Some businesses do not realize the importance of innovation. As a result, some companies do not innovate at all. One of the innovation variables is the innovation performance, which is evaluated based on the profit from those products that were innovated. Every business that wants to be competitive in today's globalized market needs to innovate. A suitable means for the support and development of innovations is the creation and introduction of an innovation strategy.

Innovation is a change that brings new value to the customer. This distinguishes the innovated product from the product on which a normal change was implemented. The new value for the customer consists, for example, in ease of use or handling of the product, in reduced risk, increased comfort, convenience. An upgraded product means more fun, fashion, image, more emotions, a better price, or friendliness to the environment. (Kislingerová, 2008) Stanislawski notes that "innovative development is one of the key conditions ensuring the implementation of entrepreneurial activity in a competitive market." (Stanislawski, 2021) In modern economic conditions, one of the important factors of ensuring the enterprises effective functioning in various sectors of the economy is the successful implementation of innovative activities. These are innovative activities that allow to ensure sustainable economic development, which requires the innovative activities intensification, increasing the innovation potential, introducing the targeted strategic planning and practical use of innovations. Until now, research in the field of innovation management has mainly focused on advanced market economies and large enterprises, but small and medium-sized enterprises, which in the Slovak Republic make

up 99% of the total number of business entities, contribute significantly to innovation and economic growth.

LITERATURE OVERVIEW

In recent years, we can state that innovation is a key driving force of economic growth and development in all countries, as well as a key element in increasing the competitiveness of enterprises, especially small and medium-sized ones. A feature of the development of enterprises in modern conditions is the transition to innovative economic systems. Global trends in innovative development are characterized by structural restructuring of the economy based on the penetration of information and communication technologies into all spheres of economic activity. (Volkova, 2020) Innovation became the symbol of the modern society, a panacea for solving numerous problems of the contemporary enterprise. Enterprises enter the innovation activities in order to achieve competitive advantages. (Szmal, 2015)

The word innovation itself is of Latin origin. Hudec states that the term innovation means the introduction of a new or significantly improved product or service to the market or introducing a new or significant process improvement within the company. (Hudec, 2007) According to the Collins Dictionary (2019), the term innovation is generally defined as the introduction of new ideas or methods. The Oslo Manual (2018) defines an innovation as a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process). (Oslo manual, 2018)

Innovation is a highly diverse activity. Enterprises can innovate through product or business process innovation, with the latter including process, marketing and organisational innovation. Enterprises can adopt new technologies developed by other enterprises or they engage in intensive in-house research and innovation activities. (European Innovation Scoreboard, 2022) Due to this, we distinguish several types of innovation. Satell (2017) divides the types of innovation according to the applied innovation strategy into breakthrough, maintenance, disruptive and basic research.

Innovation can create opportunities in all types of regions, regardless of their level of development. Policies fostering regional innovation, however, need to adapt to the nature of local innovation activities, which can vary substantially according to regional characteristics. (OECD, 2020)

Innovation is key for growth in all types of regions, but many regions are struggling to transition towards new growth opportunities and to reap the benefits that a constantly expanding global pool of knowledge offers. Regional productivity and innovation gaps highlight that knowledge diffusion is by no means automatic. What helps regions to innovate depends on the capacity of their regional innovation system. Research highlights the role of "absorptive capacity" of regional innovation systems. For instance, larger investments in research and development have different growth impacts in regions depending on the degree of "absorptive capacity". (Ahlin, Drnovšek and Hisrich, 2014) Countries are seeking strategies to promote innovation activities that are effective for all types of regions. In some cases, they do so by adapting rules to enable all regions to participate in research activities, e.g. through modified co-financing and eligibility criteria for grants for different regions to overcome a lack of public funds. Small businesses that successfully innovate increase their chances of growth and survival. Businesses that do not incorporate innovation into their core business strategy may become uncompetitive due to outdated products and processes. Product innovation is important to maintain market share, process innovation is important to maintain competitive pricing, and management innovation is important to maintain a flexible and sustainable business. Small and medium-sized enterprises need to better understand how to overcome obstacles and effectively implement innovation processes. Aligning an innovative corporate culture with a company's business strategies can lead to greater efficiency and organizational success. (Madrid-Guijarro, Garcia, Van Auken, 2009). The identification of barriers to innovation activities is of significant importance in the proper climate development for innovation. In the course of this process, it should be remembered that the perception of factors hampering or preventing the implementation of innovation activities depends on the characteristics of enterprises. The

heterogeneity of perception is influenced by, e.g., enterprise size, the history of its operations, development strategy, the entrepreneur's country of origin, the degree of innovation as well as the division into innovative and non-innovative entities. The latter should remain the subject of special interest, because the identified barriers determine their resignation from innovation activities. (Sobczak, Gluszczuk, 2020)

In the management of innovations in small and medium-sized enterprises, innovation barriers arise, which were divided into the following categories. (D'Este a kol., 2012)

1. Cost barriers - high economic risk, high cost of innovation, lack of internal funding sources and lack of external funding sources,

2. Knowledge barriers - lack of suitable professionals, lack of information about technology and lack of information about markets,

3. Market barriers - market with dominant companies and uncertain demand for innovative products and services,

4. Regulatory barriers - legislation and legal regulations.

Internal barriers originate within the enterprise and are closely related to its management and organization and include issues related to, for example, financial resources and competences. External barriers come from the external environment of the enterprise and arise when the enterprise must react to the behaviour of competitors, customers, partners, and the government. (Sandberg, Aarikka-Stenroos, 2014) Internal barriers are related to certain problems based on the company's resources. These obstacles, associated with a lack of financial resources, weak financial position, insufficiently qualified human resources, low quality of work, low commitment of human resources and high risk, are perceived by some enterprises as too big to overcome, thus limiting the innovative activities of the enterprise and reducing the innovativeness of the enterprise in the field processes and management. (Madrid-Guijarro, Garcia, Van Auken, 2009)

Innovation is central to improvements in living standards and can affect individuals, institutions, entire economic sectors, and countries in multiple ways. Sound measurement of innovation and the use of innovation data in research can help policy makers better understand economic and social changes, assess the contribution of innovation to social and economic goals, and monitor and evaluate the effectiveness and efficiency of their policies. (Oslo manual, 2018) Innovations derive from knowledge-based activities that involve the practical application of existing or newly developed information and knowledge. Knowledge is one of the most strategically significant resources for firms. How it is accessed and deployed is particularly important for firms engaged in innovation activities. Innovations would not occur without adequate research and development. Research and development are the main driver of innovation. The relationship between research, development and innovation is very complex. Edquist (2011) emphasizes that research and development activities bring new knowledge, while development activities bring advanced products and processes. Innovation determines a new way to improve, renew and change something. (Stankovicová 2011)

GOAL AND METHODOLOGY

Recently, we have been increasingly encountering terms such as turbulent environment, dynamic environment, unstable environment, and businesses must be prepared to respond flexibly to challenges arising from such an environment. The competitiveness of companies depends more and more on the rapid adaptation to ongoing changes. The sources of basic competitive advantages are efficiency, quality, innovation, full understanding, and sensitivity to customer requirements. The main driving force behind innovation is adequate research and development. Research and development represent one of the steps towards innovation and the innovative activity of companies.

The aim of the contribution is to evaluate the Global Innovation Index in the Slovak Republic and the innovative activity of small and medium-sized enterprises in the Slovak Republic as the basis of the company's competitive advantage based on selected indicators. Subsequently, we will analyse and evaluate the use of human resources within the innovative activities of the company and in research and development in individual regions of the Slovak Republic. The article was prepared based on the following general scientific methods - generalization,

comparison, analysis, and synthesis. We will evaluate and analyse the selected indicators based on the data of the Statistical Office of the Slovak Republic and data from The World Intellectual Property Organization.

FINDINGS AND DISCUSSION

Innovation performance of the Slovakia

When evaluating the innovative performance of the Slovak Republic, we unfortunately must state that it is low compared to other countries of the European Union. Although innovation performance is gradually increasing, it is still below the level of most EU countries, and Slovakia is among the so-called moderate innovators. This negative development in the field of innovation is also confirmed by the

development of the Global Innovation Index indicator. GII data is processed annually by the World Intellectual Property Organization - WIPO and considers approximately 80 indicators, which are divided into two categories - innovation inputs and innovation outputs. Innovation inputs include, for example: legislative environment, stable business environment, infrastructure, education, higher education, research and development, ecological sustainability, investments, availability of financing, market competition, highly qualified workforce, and others. Innovation outputs include, for example: the creation of innovations, the impact of created innovations, intangible assets, creative industry, creativity in the online space and others. The GII aims to capture the multidimensional aspects of innovation.

Tab. 1: Global innovation index - ranking for Slovakia.

	2015	2016	2017	2018	2019	2020	2021	2022
Global innovation index	36	37	34	36	37	39	37	46
Innovation inputs	37	42	39	39	42	43	42	54
Innovation outputs	38	38	35	36	33	34	35	45

Source: Processed based on data from https://www.wipo.int/portal/en/index.html

Slovakia ranks 46th among the 132 economies featured in the GII 2022. Compared to 2021, it fell by 9 rungs. The cause of such a development can be e.g. poorly set legislation, whether the lack of support infrastructure, insufficient investment, lack of skilled labor, etc. The partial results of the GII evaluation point to the fact that

SR achieves better results in innovation outputs than inputs. Slovakia produces more innovation outputs relative to its level of innovation investments. Despite the slight improvement, Slovakia's performance in relation to GDP per capita is below expectations, given the level of our economic development.

Tab. 2: The seven GII pillar ranks for Slovakia

	2020	2021	2022
Knowledge and technology outputs	30	30	28
Infrastructure	33	39	41
Business sophistication	46	43	45
Human capital and research	62	58	46
Institutions	41	39	59
Creative outputs	39	43	68
Market sophistication	82	73	70

Source: Processed based on data from https://www.wipo.int/portal/en/index.html
Note: The highest possible ranking in each pillar is 1.

Our country achieves lower results than the European regional average in all investigated

areas2 of the Global Innovation Index, which is probably a reflection of the current low funding

of the innovation ecosystem. In table 2 we can see an overview of the rankings in the seven areas of GII for the last three years. Slovakia performs best in Knowledge and technology outputs and its weakest performance is in Market sophistication and Creative outputs.

Innovative activities of small and medium-sized enterprises in Slovakia

Small and medium-sized businesses form the basis of the creation of added value in the economy, employment, and have a significant impact on the creation of public resources through the tax system. Innovative activities of small and medium-sized enterprises represent one of the main prerequisites for their competitiveness in the markets. In the current conditions, only business entities that can constantly innovate their products and services and thus adapt to the new competitive conditions of the business environment can survive in the fierce competition. The innovation potential and innovation performance of small and medium-sized enterprises determines to a significant extent the future direction of the development of the entire national economy and decides on the orientation of the entire economy. The innovative activity of SMEs lags significantly behind the innovative activity of large - often multinational companies. At the same time, in many EU countries, SMEs have an irreplaceable place, both from the point of view of employment and the creation of added value. Innovations in small and medium-sized businesses are the driving force of economic growth. According to the results of the statistical survey of the Slovak Ministry of Economy, in 2020 the share of enterprises with innovative activity in Slovakia was 33.96% of the total number of enterprises, while the average in the European Union is up to 51.6%. This unfavourable situation is, among other things, also a consequence of the action of innovation barriers that prevent the development of innovative activities of enterprises. When we look at enterprises with innovative activity broken down by size groups, innovative enterprises in the group of large enterprises dominate for a long time. Their share has long been above 60%. In 2020, it was 65% of large enterprises that engaged in innovative activities as part of their activities. In 2020, the share of innovating enterprises in the size group of medium-sized enterprises was 46%, and among small enterprises more than 33% of enterprises are engaged in innovative activities.

Tab. 3: Enterprises with innovative activity by size groups of enterprises

		2010	2012	2014	2016	2018	2020
Enterprises together	Number of enterprises	2306	2496	2632	2488	2794	3204
Enterprises together	Share of the total number of enterprises in %	32.79	31.29	29.17	28.68	27.96	33.96
Small businesses	Number of enterprises	1274	1585	1772	1450	1753	2053
Small businesses	Share of the total number of enterprises in %	26.69	27.23	25.86	22.78	23.29	28.78
Medium enterprises	Number of enterprises	757	657	633	782	754	848
Medium enterprises	Share of the total number of enterprises in %	41.34	37.72	36.21	41.55	37.90	46.11
Large enterprises	Number of enterprises	275	254	227	256	287	303
Large enterprises	Share of the total number of enterprises in %	64.25	61.35	53.92	59.67	60.40	65.49

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

The intensity of innovation of small and medium-sized enterprises and the involvement of business entities in the process of innovation can be evaluated through the volume of funds that SMEs invest in innovation from the total volume of their sales (table 4). When analysing the innovation intensity of SMEs, we can see that the share of innovation expenditure from the volume of received sales during the monitored period is the highest among small enterprises in the industry, even though this share has decreased by 3 percentage points over the last 10 years.

Tab. 4: Innovation intensity in % (share of innovation expenditures as a percentage of sales in innovating enterprises)

	2010		2012		2014		2016		2018		2020	
	I	S	I	S	I	S	I	S	I	S	I	S
Enterprises together	1.4	0.8	2.0	1.2	1.3	1.4	1.7	1.5	2.2	2.4	1.9	2.0
Small businesses	6.1	0.5	4.3	0.9	1.6	0.8	5.9	2.8	3.1	3.7	3.0	1.8
Medium enterprises	2.4	1.8	2.8	0.8	4.5	1.1	2.9	0.9	2.0	2.5	1.7	2.4
Large enterprises	1.1	0.6	1.8	1.6	0.9	1.9	1.3	1.4	2.2	1.8	1.9	1.8

Source: Processed based on data from the Statistical Office of the Slovak Republic
Note: I – industry, S – services

Use of human resources in research and development

Human capital has a significant impact on reducing innovation barriers such as lack of knowledge and market uncertainty. Investments in innovation and in increasing the qualifications of employees complement each other and positively affect the innovative performance of enterprises. The level and breadth of qualifications of a company's employees is important for innovation, especially in SMEs and start-ups, which can carry out very little research, and whose workforce may include only a small number of scientists and technicians. Enterprises with a higher proportion of highly qualified employees are better able to overcome obstacles to innovation. Innovations would not occur without adequate research and development. Research and development are the main driver of innovation. An important factor in research and development and thus also in the innovative activities of companies are human resources, which increase technological progress, scientific knowledge and improve the quality of life.

Tab. 5: Research and development employees broken down by region and gender.

	2017				2018				2019			
	Men	Women	Together	% share in SR	Men	Women	Together	% share in SR	Men	Women	Together	% share in SR
BA	8196	6732	14928	44.6	9254	7089	16343	45.7	9467	7335	16802	46.3
TT	1210	718	1928	5.8	1139	739	1878	5.3	1259	727	1986	5.5
TN	1822	623	2445	7.3	1817	578	2395	6.7	1844	593	2437	6.7
NR	1293	1316	2609	7.8	1401	1326	2727	7.6	1309	1226	2535	7.0
ZA	2328	1309	3637	10.9	2640	1355	3995	11.2	2719	1295	4014	11.1
BB	1349	901	2250	6.7	1396	887	2283	6.4	1437	919	2356	6.5
PO	789	591	1380	4.1	852	609	1461	4.1	830	609	1439	4.0
KE	2494	1796	4290	12.8	2688	2000	4688	13.1	2770	1970	4740	13.1
SR	19481	13986	33467	100	21187	14583	35770	100	21635	14674	36309	100
	2020				2021				2022			
	Men	Women	Together	% share in SR	Men	Women	Together	% share in SR	Men	Women	Together	% share in SR
BA	9666	7551	17217	46.3	10301	7745	18046	47.2	10808	7975	18783	47.4
TT	1292	777	2069	5.6	1628	913	2541	6.6	1751	924	2675	6.8
TN	1810	584	2394	6.4	1968	620	2588	6.8	2017	621	2638	6.7
NR	1364	1167	2531	6.8	1412	1177	2589	6.8	1438	1162	2600	6.6
ZA	2535	1099	3634	9.8	2237	1006	3243	8.5	2380	1036	3416	8.6
BB	1652	987	2639	7.1	1778	1018	2796	7.3	1809	1007	2816	7.1
PO	892	600	1492	4.0	939	623	1562	4.1	956	590	1546	3.9
KE	3209	2004	5213	14.0	2872	1981	4853	12.7	3033	2107	5140	13.0
SR	22420	14769	37189	100	23135	15083	38218	100	24192	15422	39614	100

Source: Processed based on data from the Statistical Office of the Slovak Republic
Legend: NR - Nitra region, KE - Košice region, PO - Prešov region, BB – Banská Bystrica region, ZA – Žilina region, TN – Trenčín region, TT – Trnava region, BA – Bratislava region, SR - Slovak Republic

The field of research and development is largely dependent on human potential, knowledge and insights, more than other fields. In the field of research and development, it is necessary to support the development of intangible capital - people and their ideas, knowledge, and link it to real material outputs and research results. The number of research and development employees available to the national economy thus becomes the main measure of the country's research and development potential. Bratislava region has the largest number of research and development workers, which makes up more than 40% of research workers in the Slovak Republic during the entire observed period. This may also be due to the number of public research institutes and other organizations that are mainly located in the capital, i.e. in the Bratislava region. The Košice region is second in order - but significantly weaker in terms of the number of researchers. The Žilina Region is in third place throughout the analysed period. The Prešovský region has long had the smallest share in the number of research and development workers. Although based on the development index (tab. 6), we can see that the largest increase in the number of research and development employees was recorded in the Trnava Region, where their number increased by 39%. On the contrary, the Žilina Region recorded a slight decrease. When we look at the breakdown of workers by gender, men dominate in every region. In Table 6, we can see the breakdown of research and development employees by job classification. It is logical that in each region researchers significantly predominate over technical and support staff.

Tab. 6: Research and development employees broken down by region and job classification.

		2017	2018	2019	2020	2021	2022	Index 2022/2017
BA	researchers	12390	13594	13562	13858	14519	15030	1,21
	technical and equivalent personnel	1792	2003	2348	2486	2617	2801	1,56
	support staff	746	746	892	873	910	952	1,28
	together	14928	16343	16802	1217	18046	18783	1,26
TT	researchers	1484	1496	1533	1614	1769	1813	1,22
	technical and equivalent personnel	274	267	273	291	595	672	2,45
	support staff	170	115	180	164	177	190	1,12
	together	1928	1878	1986	2069	2541	2675	1,39
TN	researchers	1385	1338	1448	1405	1634	1665	1,20
	technical and equivalent personnel	723	648	707	695	705	668	0,92
	support staff	337	409	282	294	249	305	0,91
	together	2445	2395	2437	2394	2588	2638	1,08
NR	researchers	1942	2224	2075	2027	2083	1940	0,99
	technical and equivalent personnel	362	289	231	228	285	507	1,40
	support staff	305	214	229	276	221	153	0,50
	together	2609	2727	2535	2531	2589	2600	0,99
ZA	researchers	2916	3044	2856	2522	2525	2667	0,91
	technical and equivalent personnel	506	615	856	810	440	567	1,12
	support staff	215	336	302	302	278	182	0,85
	together	3637	3995	4014	3634	3243	3416	0,94
BB	researchers	1885	1857	1916	2028	2175	2043	1,08
	technical and equivalent personnel	249	274	305	322	303	372	1,49
	support staff	116	152	135	289	318	401	3,46
	together	2250	2283	2356	2639	2796	2816	1,25
PO	researchers	1142	1217	1233	1237	1264	1192	1,04
	technical and equivalent personnel	171	154	141	169	196	256	1,50
	support staff	67	90	65	86	102	98	1,46
	together	1380	1461	1439	1492	1562	1546	1,12
KE	researchers	3717	3985	4228	4005	4071	4566	1,23
	technical and equivalent personnel	369	549	338	1060	561	388	1,05
	support staff	204	154	174	148	221	186	0,91
	together	4290	4688	4740	5213	4853	5140	1,20
SR	researchers	26861	28755	28851	28696	30040	30916	1,15
	technical and equivalent personnel	4446	4799	5199	6061	5702	6231	1,40
	support staff	2160	2216	2259	2432	2476	2467	1,14
	together	33467	35770	36309	37189	38218	39614	1,18

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

Legend: NR - Nitra region, KE - Košice region, PO - Prešov region, BB – Banská Bystrica region, ZA – Žilina region, TN – Trenčín region, TT – Trnava region, BA – Bratislava region, SR - Slovak Republic

It is precisely the lack of qualified employees that is a frequent barrier, especially in small, less often in medium-sized enterprises, not only the lack of qualified or creative employees, but also the problem of obtaining and subsequently maintaining them. The lack of qualified employees often also has regional dependence. Employees who bring innovative ideas to the company are usually concentrated in those locations where there are enough job opportunities. Small businesses, even if they get such employees, may have problems with the evaluation and career growth of high-quality and innovative employees.

CONCLUSION

In the period of worldwide growing globalization and digitization, innovations are becoming an increasingly important factor determining the success of business activity. They provide companies with higher growth, increase efficiency, competitiveness and enable companies to create new markets. In conclusion, we can state that, despite the possibilities, the Slovak Republic is still considered a moderate innovator both in the global and European space. In order for the company, as well as the economy itself, to survive in the current competitive struggle, they must respond flexibly to the changes that global society brings. And if the economy does not support, initiate and create suitable conditions for innovation, other economies will overtake it. Recently, the COVID-19 pandemic has slowed down and limited innovative activities in some industries. But at the same time, it created a new space and brought new challenges for the development of innovations. The identification of obstacles to innovative activities is of great importance for the proper development of the innovation environment. The identification of obstacles to innovation activities is of great importance for the proper development of the innovation environment. During this process, it is necessary to keep in mind that the factors that prevent the implementation of innovative activities depend on the characteristics of the company, such as the size of the company, the history of its operation, the development strategy, the country of origin of the entrepreneur, the degree of innovation, etc. Most often, the lack of own financial resources and personnel issues related to the acquisition and retention of qualified employees are considered barriers to innovation. It is essential to not stop in the innovation process and to create suitable conditions, especially from the state, for the use of the innovation potential, which the Slovak Republic undoubtedly possesses.

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