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Innovations in a Modern Engineering Enterprise in the Context of Industry 4.0 Strategy

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Abstract. Innovations are an essential part of business management in modern society. In addition to large enterprises and research and development centers, small and medium-sized enterprises also hide great innovative potential. Moreover, it is precisely the innovations that lead businesses to permanent growth and prosperity. In addition, from the point of view of Industry 4.0, innovation must be considered as an essential part of the functioning of a modern enterprise, regardless of its size. The article compares statistical indicators that capture enterprises' innovative activity or inactivity in the Slovak Republic. Enterprises that want to define themselves as innovative should have a suitably prepared and functioning environment, while internal and external conditions are essential. However, it turns out that Slovakian companies have not created suitable conditions for innovation, and in the long term, their interest in innovation is declining. At the same time, because of the industrial revolution, many professions are also changing, and the demands for specific knowledge are not only growing for the newly created ones, but they will also require an active approach to changes, i.e., innovations. Companies must introduce an innovative approach in the education process itself, and as it shows, it will not be possible without a systemic approach.

Keywords: process innovation, product, education, small-scale enterprise, Industry 4.0.

1 Introduction

No development of society is possible without changes. Changes are often associated with innovations that were perceived negatively in the past. People were more conservative and afraid of changes and job loss. However, as society developed, changes in human thinking and innovation became signs of progress and made everyday life easier. The view on innovations has changed, and they have begun to be seen as an essential part of business processes that bring new opportunities for production and consumption. Innovation has become an essential driver of economic progress, benefiting entrepreneurs, consumers, and the economy. Unambiguously defining innovation is quite challenging, as innovations include a wide range of business activities. Nowadays, most companies perceive innovation as something positive and natural, while innovation is often inflected with the term research. At the same time, however, it is true that innovation may or may not be the result of innovative activity.

According to the Oslo Manual [1], innovation activity is defined as such activity that "includes all development, financial and business activities carried out by a company, the purpose of which is to lead to innovation".

The origin of the word innovation comes from the Latin word innovare, which means to renew. In a simplified way, innovations can be described as the development and subsequent implementation of ideas and technologies that lead to more efficient production or higher quality goods and services.

Michník [2] defines innovation as a new idea or concept in the economic field: finding new or improved products, services, processes, or technologies and putting them into practice. In a narrower sense, it is a creative process in which existing things are combined in a new way to produce or offer a unique thing. In an even narrower sense, innovation is just a new idea or concept.

During the 2000s, the following definition for innovation was published [3]: "the invention and implementation of a practice, a process of a structure or a management technique that is new in terms of the state of

knowledge and contributes to the achievement of the organization".

The world's most widely used definition of innovation is based on the Oslo manual [1]. The latest, fourth revised version from 2018 defines innovation as the Oslo Manual's revised definition also reduces the ambiguity of the requirements for "significant" change by comparing new and improved innovations to a company's existing products or business processes.

The basic definitions of product innovation and business process innovation are as follows: "a new or improved product or process (or a 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)". A unit is anything that develops innovations (e.g., enterprises, households, or associations).

2 Literature Review

The importance of innovation, innovation milieu, innovation infrastructure, innovation systems, innovation culture, innovation strategies, and policies is growing [4, 5].

Due to the number of innovations, there is an attempt in the professional literature to organize innovations according to selected criteria. Innovations are thus divided according to several aspects, and it is possible to distinguish types and types of innovations.

According to the Oslo manual [1], innovations are divided into technological and non-technological. Technological innovations include the following:

1) product innovations, i.e., product or service innovation that the company offers. This may also include the introduction of a new product or service;

2) process innovations – represent changes in how products or services are created and delivered. It can only be a matter of removing deficiencies in already established processes. These include, e.g., significant changes in technology, reduction of safety risks or environmental burden;

Non-technological innovations consist of:

1) marketing innovations – they focus on offering products or services in new markets and positioning the company's product on the market to increase production. The goal is to use a new marketing method that has not been used by the company before but could have been created and used by someone else;

2) organizational innovations – this is a new way of organization in many matters, including the organization of relations with other organizations, the organization for the procedures of the work performed, or the organization in the division of duties and responsibilities.

Research and development, as well as business and marketing, are nowadays determinants for implementing innovations. However, it is not true that every research must end in innovation, just as it is not true that every innovation is necessarily preceded by research and development. Precisely in the current hectic time of rapid technological development and the development of society, it is true that innovations are often created based on a combination of both stimuli. Therefore, in the end, the list of the four innovations mentioned above is reduced to two main types:

1) product innovations – "a new or improved product or service that is significantly different from the company's previous goods or services that have been introduced to the market;

2) innovation of business processes – a new or improved business process for one or more business functions that is significantly different from the company's previous business processes and which the company has implemented.

Rostášová et al. [6] lists several other qualifications and classifications of innovations, e.g., primary and secondary, individual and complex, absolute and relative, innovations with and without investment, and quantitative and qualitative innovations.

Special types of innovations are:

1) open innovations, which represent innovations from the outside environment, for example, new ideas and thoughts from customers, suppliers or also innovations in the form of purchasing a license or patent;

2) reverse innovations, when new ideas, products, or services are developed in developing countries or in developing markets, and only then are they introduced to developed markets;

3) innovation for the bottom of the pyramid, where the bottom means the population of people in developing countries. The main idea is to apply new ideas and thoughts to a product that has a similar utility value to a competing product but is incomparably cheaper and, therefore, more accessible to low-income groups of the population;

4) disruptive innovations, creating a completely new market while partially or destroying an existing market (e.g., email, which replaced classic letter mail);

5) cost innovations based on the idea of providing the same products/services with the same functional characteristics, at the same quality, as competing/substitute products, that is, satisfying the exact customer needs, but at a much lower price [7].

The research work [8] describes innovation as "any change in the internal structure of the production organism, i.e., any transition from the original to a new state". Based on a long-term study of innovations, he introduced a 10-level division that evaluates the quality of innovation in terms of the intensity of innovative changes. The degrees of innovation can be summarized in Table 1.

It is clear from the above reports that there is neither a single definition of innovation nor a single classification. The effort of the Oslo Manual [1] is not sufficient, which is also because innovations are different and touch almost all areas.

Table 1 – Innovation degrees

Degree	Marking	What is preserved	What is changed	Example
0	Regeneration	Object	Original qualities are restored, and defects are removed	Repair maintenance is a simple restoration of the original properties
Rationalization				
1	Quantitative change	All characteristics	The number of factors, the number of resources to satisfy the demand, changes	Increase in production capacity, purchase of new workforce, machines of the same quality
2	Intensity	Quality and connection	Speed of operations and relationships between elements of production	Machines with lower performance are eliminated, and production is shifted to machines with higher performance
3	Reorganization	Qualitative characteristics	Division of activities and resources are rearranged to meet demand, and production is adjusted to the most efficient production elements.	Transfers of operations, use of more powerful machines, organizational changes
4	Qualitative adaptation	Quality for users	Connection to other factors, rationalization of both the process and the product	Construction technology, rationalization leading to labor and cost savings
Qualitative continuous innovation				
5	Variant	Structural solution	Partial quality	Faster machine, improvement of product properties
6	Generation	Construction concept	Design solutions, new product generation, and reconstruction while maintaining the original concept	Machine with electronics
Qualitative discontinuous innovations				
7	Kind of	Principle of technology	Construction concept, change of concept while preserving the original principle	Jet machine
8	Origin	Belonging to a tribe	The principle of technology, a completely new principle of using the knowledge of science	Hovercraft
Technological revolution – microtechnologies				
9	Tribe	Nothing	Access to nature	Gene manipulation

3 Research Methodology

The article's methodology is based on obtaining deep, contextualized, non-numerical data. The main task is to understand the connection between innovative needs and processes in the enterprise. The essence of innovation lies in the utilization of knowledge. It is necessary to ensure companies innovate and that innovation is sustainable [9].

The research aims to draw attention to the importance of innovations for individual business entities and the whole country. In connection with innovations, it should be emphasized that the concept of the innovative activity itself is multi-layered, and innovations, because of innovative activity, can take different forms.

The ambiguity of the concept of innovation is presented in selected examples of definitions of the concept of innovation found in professional literature.

Because innovations can relate to a number of products, marketing, business processes, and other components of production, sales, or procurement, and innovations can be applied in all sectors of the economy, there is no clear definition of the concept of innovation. Experts only lean towards some selected definitions, which serve more or less to make it possible to measure innovations statistically.

However, the very creation and subsequent application of innovations in practice has an impact on the competitiveness of the country, on the creation of GDP, and the standard of living of the inhabitants of the given country. Slovak Republic has long lagged other EU countries in innovation and innovation performance.

The Regional Innovation Index (RII) indicator of the European Commission was chosen to compare the Slovak Republic with the average of EU countries.

The impact of science and research expenditures, which were spent by individual entities implementing science and research, and the created GDP in current prices in the Slovak Republic for 2010–2021 was analyzed through regression analysis.

Enterprises that want to innovate need, in addition to educated and creative employees, an innovation leader who plays an important role. He leads the company, takes care of the development of employees, supports them in their ideas, and participates in the company's innovative activities.

"Innovators need mutual contact, new inspiration, stimuli, examples from other businesses in the sense of how others do it" [10].

Enterprises that want to engage in innovation need to have an appropriately created and functioning

environment that is made up of several components. It can be primarily talked about internal and external conditions. The creation of an innovation strategy and corporate innovation activity defines internal conditions. External conditions are primarily determined by the state, city/municipality where the company operates. Creating a pro-innovation business environment helps companies to increase the innovation potential of the company. Only in an environment that supports innovation is it possible to make targeted use of innovation potential through own research, patents, technological databases, publications, suppliers, and direct contact with universities and research institutes.

Nowadays, many experts and methods can bring many ideas and potential for innovation in a short time. In addition to the popular way of finding digitization innovations through hackathons, guidance on how to focus and choose the right type of innovation in the enterprise is offered by Doblin and Deloitte Business. As a global company, it has operated in the market since 1981 and is primarily dedicated to innovations and their support. Since 1998, the company has developed a model of 10 types of innovation, which helps companies identify the opportunity for innovation and develop viable innovations, helps companies diagnose and evaluate the internal approach to innovation, or estimates untapped innovation potential. The model creators claim that all innovations combine the categories summarized in Table 2.

Table 2 – Innovation types

Type of innovation	Description	Use
Innovations detected to the inside of the company configuration/business model		
Profitable model	Focused on generating profit from the product	Places to rent products and make it available for a subscription
Networking	Connection with other partners to increase the customer's added value. For an innovator, it is essential to find a community that will bring benefits to all involved and good relationships within the community	Open innovation, where partners share common resources, technology, share risk and rewards
Structure	A combination of wealth and talent	–
Process	After creating superior methods/procedures for work. It shows how, based on technological procedures, it is possible to increase the company's competitiveness to overtake the competition. Process innovation can also mean introducing new technology and software, which will facilitate work in the company or improve the use of the product by the customer. The innovation of the process is, for example, the introduction of automation of orders in retail, but also the automation of supply supplemented by, for example, statistical calculations of the size of orders	Speed product design and sales. Companies that have adapted 3D technologies in their businesses
Offer/product		
Product performance	Improving functionality and distinguishing features for the customer	–
Product system	Complementing the product with a service or other complementary product so that they are integrated into one system	Enterprises that offered their products as part of a lifestyle. Companies that are gradually expanding their product range
Service	Supports and enhancements that are part of the product. The effort is to understand the product and its features, try it, and advocate for it in a social group	Companies that offer a live broadcast and the possibility to order a personalized product within minutes of seeing it.
Channel	It represents how products are delivered to customers and users, and it can be a classic sale in a store, online, or another type of sale	The chain of stores uses publicly available platforms, where the customer can scan the product they are interested in using a QR code, pay for it with a payment card, and the products are delivered to the customer
Brand	It represents the company's offering and its business to the customer and goes a long way to building a good name for the business and being able to grow in the long term	–
Customer engagement	Through this type of innovation, the business seeks to create and improve interactions with the customer	–

The model is divided into three parts according to how distant the innovations are from the customer. The first group of innovations is focused more on the company. The closer the company is to marketing innovations, the closer it is to the customer with its innovations, which means a transition from innovation in technologies to marketing innovations. No single business can innovate in all 10 areas at once, especially if it is an "innovation beginner".

However, it is good if he knows all types of innovations and starts innovating based on his capabilities and market situation. In the case of more straightforward innovations, the company uses one or two innovations corresponding to incremental ones. Simple innovations help companies stay in the market and, in some cases, get to a leading position, but they do not create a name, brand, or story in the market that excites the customer. With growing experience, the company is able and willing to innovate in several areas at once.

Whether innovations relate to business processes, products, or marketing, they increase business performance and competitiveness. A higher rate of innovation activity has a synergistic effect and strengthens innovation activity even in companies that did not innovate until then. At the same time, the competitiveness of companies in foreign markets increases, and thus, the potential and performance of the country's entire economy also increase.

The European Commission evaluates the innovation performance of EU regions through the regular annual Regional Innovation Index (RIS). According to this index, countries are divided into innovation leaders, strong innovators, average innovators, and moderate innovators. In 2022, the group of innovation leaders included Switzerland, Sweden, Denmark, Finland, the Netherlands, and Belgium.

For a long time, the Slovak Republic has been included in the group of moderate innovators, which includes, except for the Czech Republic, all other V4 countries, together with, for example, Romania, Bulgaria, Lithuania, and Croatia. In 2022, the Slovak Republic achieved results at the level of innovation leaders in some indicators (technologies related to the environment, export of medium and high-end goods, emissions of fine particles into the air, and sales of innovative products).

Compared to the previous year, the Slovak Republic worsened in all indicators. Lagging EU countries increased even more in 2022 than in previous years, even though several performance indicators in the Slovak Republic recorded a significant increase compared to 2015.

Overall, it is possible to assume Slovakia's innovation performance is slower than EU countries' innovation development dynamics.

4 Results

The innovation performance of the Slovak Republic in individual innovation areas is presented in Figure 1.

Compared to the average of EU countries, Slovakia lags the most in the indicators of government support for business science and research (SR reaches only 24.6 points; EU average is 113), labor mobility (SR 29.2 points; EU 141), business sector spending on science and research (SR 29.7 points; EU 115). Other alarming areas follow with a smaller distance, such as lifelong learning (SR 33.3; EU 100), application of triadic patents (SR 38.5; EU 93), lifelong learning (SR 33; EU 100), and support and financing (SR 38.6; EU 121).

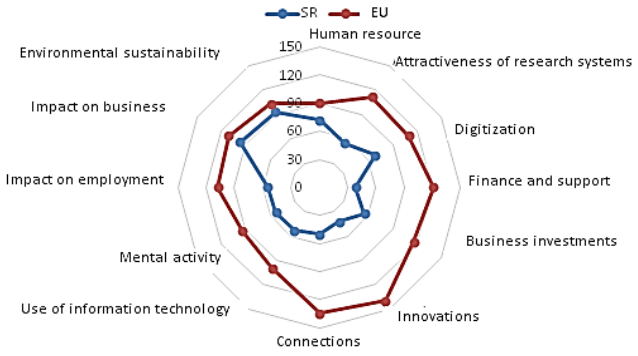

Figure 1 – Innovation performance of the Slovak Republic in individual innovation areas (EIS 2022): SR – Slovak Republic; EU – European Union

Current assessments show that the Slovak Republic ranks 23rd in innovation within the European Union. The Slovak Republic has started to run out of traditional sources of growth because it has more expensive energy and less educated human capital. Moreover, the absence of reforms and the current government's incompetence have significantly worsened this area. Slovak education is the 4th worst in the Union, and Slovaks live shorter than the Union average.

The global ranking of innovations awarded 4.3 points for the Slovak Republic, which places it in the unflattering penultimate place within the EU.

Even though the process of creating innovations is often creative and spontaneous, many companies engage in innovation purposefully. Regardless of how the company innovates, every innovative activity and the subsequent introduction of the innovation into the company's production, sales, or process relates to finances. The growth of spending on science and research does not have a self-serving character, as it is ultimately reflected in the growth of the population's standard of living and the growth of the competitiveness of enterprises.

It can also be compared to the impact of spending on research and development in the Slovak Republic on GDP in 2010–2021. Whether there is any relationship between GDP and spending on research and development in the Slovak Republic was derived from a regression analysis using a correlation coefficient. At the same time, the statistical significance of dependence was assessed at the significance level $p = 0.05$.

Expenditure on science and research comes from several sources. Primarily, in statistical monitoring, they can be assessed as corporate and government expenditures, university expenditures, and non-profit organization expenditures. Business expenses should play a decisive role in financing research and development.

From 2010–2021, they accounted for less than 50 % of the total expenditure on science and research in the Slovak Republic. It can be considered positive that the share of business expenses in total expenses and their percentage share grew.

The share of funds flowing into research and development from other sources was significantly lower. The second largest government spending accounted for an average of only 23.4 % of total spending in 2010–2021, almost half of corporate spending.

It is also clear from these data that a statistically significant correlation was manifested only between corporate expenditures on R&D and GDP. The correlation value is approaching 1, which means that the relationship between these two independent variables is significant, and it can be assumed that as the company's R&D expenditure grows, so does the domestic GDP. On the contrary, the growth of GDP also supports the growth of corporate expenditure on R&D (Figure 2).

A statistically robust correlation value was not confirmed for other sources of funding for science and research in the Slovak Republic (government expenditures and GDP – value 0.245; higher education expenditures and GDP – value 0.202; expenditures of private non-profit organizations – value 0.221). Even the significance value was not met in all cases, and the value *p* was higher than 0.05 in all three cases.

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0,96637252							
R Square	0,93387585							
Adjusted R	0,92726344							
Standard E	2732951,98							
Observatio	12							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	1,05486E+15	1,05E+15	141,2307	3,20055E-07			
Residual	10	7,46903E+13	7,47E+12					
Total	11	1,12955E+15						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	54174993,9	2505145,793	21,62549	9,98E-10	48593181,21	59756807	48593181,2	59756806,6
podnikové	86,7569978	7,300287874	11,88405	3,2E-07	70,49094272	103,02305	70,4909427	103,023053

Figure 2 – Institutional expenditures on research and development and GDP in the Slovak Republic in 2010–2021

So, where to look for why Slovak enterprises lag other EU countries? When comparing statistical indicators that capture the innovative activity or inactivity of enterprises in the Slovak Republic, two-thirds of enterprises operating in the field of industry and services belong to the non-innovating category, that is, to the group of enterprises that do not implement innovations. The share of innovating enterprises decreased from 36.1 to 30.7 % between 2008 and 2016. In 2016–2018, the most significant decrease in the share of innovatively active enterprises was recorded in the Slovak Republic (only 28 %). In 2018–2020, the number of innovative enterprises increased slightly to 34.0 %. However, it still has not reached the level of 2018.

Since 2008, the share of innovating enterprises has been decreasing, while the share of non-innovating enterprises in the Slovak Republic has been increasing. From 2008–2016, the share of non-innovating enterprises increased from 63.9 to 69.3. In 2018–2020, the share of non-innovating enterprises fell slightly to 66.0 %. Available data from 2018–2020 shows that large enterprises with 250 or more employees innovated the most (65.6 %) and enterprises with 10–49 employees the least (31.2 %).

According to the Statistical Office of the Slovak Republic, the most common reasons why businesses do not innovate are too high costs, lack of funds for innovative activities either within the company or in connection with obtaining state subsidies or grants, lack of qualified employees within the company, lack of cooperating partners, too much competition on the market, and uncertain market demand for business ideas [11].

The Slovak Republic does not have built-in systematic processes of entrepreneurship support from primary and secondary education through higher education science and research, which would end in businesses.

Slovak companies have not created a suitable environment for innovation, and not only from the inside but also the external environment is not accommodating. The results of the EIS 2022 also confirm this finding. At the same time, the requirements placed on businesses are changing rapidly, mainly due to Industry 4.0. It places increased demands not only on the automation of business processes but also on digitization. Companies thus need to adapt the current workforce to the changes occurring on the one hand. On the other hand, it is necessary to educate

the generation entering the work process and prepare them for constant changes.

The structure of jobs will change because of the Industrial Revolution; many professions will disappear, but many new ones will also be created. The newly created ones will be more demanding on specific knowledge and require an active approach to changes, i.e., innovations. Simultaneously, schools can only estimate what specific knowledge, skills, and habits their graduates need after finishing school. Therefore, it is assumed that schools will educate "universal" graduates. It is precisely the contradiction between the future requirements of practice and the universality of education that will lead to the fact that the generation entering the labor market will have to prepare during school education for the fact that the end of formal, whether secondary or higher education, does not mean the end of education as such. On the contrary, they need lifelong education with an active approach to solving problems and thus their active participation in the innovation process.

From the above, it follows that if Slovak companies want to innovate more in the future, it is necessary to devote attention to this area already in the educational process since primary and secondary school students. Later, university students must be prepared and educated in a system emphasizing innovative thinking and finding new, non-traditional solutions to various problems. In this way, engineering students will be directly supported for innovative thinking, which they should later transfer to their work.

On the other hand, companies must realize that the innovation process does not arise by "waiting". Creative people also need time, space, and finances, without which innovation is impossible. Many entrepreneurs are aware of this and are willing to invest part of their profits in this area, but many businesses still believe that what has worked so far does not need to be changed.

A modern company that wants to find its place in the turbulent market in the environment of Industry 4.0 must realize that today's Industry 4.0 finds application in all areas of the national economy, starting with agriculture, through production (that is, industry), healthcare, construction, transport, and other sectors. Thanks to Industry 4.0, companies use various sensors, 3D printing, robots, Big data, and drones, which place increased demands not only on the financial availability of individual elements that are introduced or that the company wants to introduce shortly but also on people and their knowledge and skills. Employees must have the necessary knowledge and skills to control the individual elements of Industry 4.0, depending on what the company uses. It is also essential and inevitable that employees know how to interconnect the individual elements of Industry 4.0 and thus create a functioning concept. However, this requires new knowledge, skills, and knowledge, which current employees should acquire through lifelong learning. Future employees should already be oriented in this direction by teaching at schools. The state should actively play an essential role in the entire system by setting up a system that supports science and research development, innovative activities at schools and in businesses, and allows businesses easy and inexpensive access to financial resources. Financial resources coming from the state budget should determine how their research and development should continue. The state's neglect of this role is fully reflected in the share of state spending on science and research from the state budget. In 2021, spending on science and research accounted for 0.9 %, only 168 EUR per capita.

The systemic approach of the state should also be reflected in the educational process. Pupils should naturally develop their curiosity and creativity while cooperating with the elements of the Industry 4.0 strategy. The non-systematic approach to education is also reflected in the inability to maintain a highly qualified workforce, which often goes abroad. The reason for leaving is financially more interesting offers and the research environment. Companies cannot join the innovation process without considering all the mentioned facts.

5 Discussion

Development and growth are constantly associated with discoveries, inventions, and new ideas, but sometimes unnoticed changes. A life that is not associated with changes means stagnation or even extinction. Almost everything related to change is included under the single innovation designation. It is precisely because of the range of concepts and activities that the concept of innovation includes that it is challenging to define this term. On the other hand, the definition of the term is essential precisely for statistical purposes, evaluations at the national or international level, but also, for example, in some countries for obtaining financial grants or various benefits.

When the world market is saturated with the production of various products and services, they are significant regardless of what kind of innovations the company carries out. It is essential for all businesses, regardless of where they operate and what they produce. It should be noted that the world market is in every city where domestic production competes with intense foreign competition. Support of domestic products thus appears to be an excellent idea and support of domestic employment. On the other hand, it can also keep alive companies whose production lags the world's and would not be able to stay competitive on the market without domestic support.

These facts are significant for Slovak companies. Although innovative companies in the Slovak Republic represent intense competition on the world market, there are significantly fewer of them than those that do not engage in innovation. According to statistical findings, the share of innovative companies in the Slovak Republic fluctuates. In 2018, companies with innovative activities made up less than 4 % of all companies operating in the Slovak Republic. This means that over 65 % of enterprises do not engage in innovative activity. This negative finding is reflected not only in statistical indicators but also in international comparisons. According to the RIS ranking, Slovak Republic belongs to moderate innovators, while in comparison with other EU countries, Slovakia's lagging in

some selected indicators is increasing. This indicates slower innovation development compared to other EU countries.

Business spending on innovation has a multiplier effect. This effect is manifested in the growth of innovative activities in the entire production chain and in the use of innovations in other industries, which are often unrelated to the original innovation. The growth of corporate spending on innovation also impacts GDP creation. The regression analysis confirmed a statistically strong dependence between the Slovak corporate expenditure on innovation and GDP. This means that businesses, with their innovations, contribute to the growth and development of the economy to a high degree.

Based on the regression analysis, it was found that there is no statistically significant relationship between government and business spending on innovation in the Slovak Republic (correlation – 0.124, $p = 0.701$). Therefore, the state should create a suitable environment for businesses that would encourage them to innovate.

The state's role is to create an innovative environment where all those concerned can work efficiently and, above all, sufficiently qualified in financially demanding investment technologies. The task of any modern and advanced state is to create conditions and implement a policy of innovative development, which should include not only the development and implementation of an industry development strategy but also assist in the financing of strategically essential and promising projects and, finally, also directly influence how they develop industries innovatively.

Nevertheless, not only should the amount of spending on innovations be necessary. The structure of spending on innovations also plays a significant role. From the data of the Statistical Office of the Slovak Republic, it emerged that companies that are engaged in innovative activity direct more than a large part of their innovation expenses (in 2014–2016, it was 68.3 %; in 2018–2020, it decreased to 47.0 %) to the procurement of machines, equipment, buildings, and software.

Two conditions must be met for a company's transition from innovative activity to successfully applied innovations in practice. The company must have a pro-innovative internal business environment, which includes sufficient financial resources and active and educated people. However, a stimulating outdoor environment is also essential. Successful innovation is one of the primary sources of economic growth [12]. Simultaneously, they are also a source of new job opportunities. However, new job opportunities are often associated with creating new types of jobs [13]. The innovation process thus creates pressure for higher professional training of employees so that employees can use new technologies [14].

Thus, The Slovak Republic has a long-term task: to create an innovative environment so that all market participants can work and effectively introduce innovations [15, 16].

6 Conclusions

In a modern, complicated industry with a high degree of intertwining and increasing speed, the need to change the state's role is becoming increasingly pronounced. A new level of interaction between large enterprises, the state, science, and technological entrepreneurs is fundamentally needed for large-scale innovation.

Without this symbiosis, the country cannot have a significant position in innovation. Although creating innovations is often spontaneous, many companies are dedicated to them purposefully. This means that employers try to hire employees who will not only solve classic problems but also be active and able to come up with new and inventive ideas. Consequently, on the one hand, the demand for classical (mainly) higher education is decreasing. On the other hand, the demand for digital skills and creative thinking is increasing.

Understanding what skills are currently most interesting and in demand by employers helps build a career strategy and points out which skills need improvement. At the same time, the modern employer and his employees must not ignore professional development possibilities.

Finally, it is essential in which field the company operates because different focuses place different demands on employees' skills. Innovations are essential, and investments in them usually bring growth to companies on the one hand and growth in the population's living standards.

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