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TALENTS AND INNOVATIONS: CASE OF SERBIA

Talenti i inovativnost – slučaj Srbije

Abstract

This research focuses on talents and skills needed for companies' leap towards a higher level of innovativeness and competitiveness in the new digital era. We analyzed data collected through the online survey conducted among 84 companies that operate in Serbia. We did two correlation analyses. The first one observed determinant of innovation and digital transformation among surveyed companies. The results showed that R&D investments and management skills are correlated and significant for all observed digital transformation and innovativeness indicators. The analysis also showed that companies in Serbia are developing more sustaining than disruptive and radical innovations. The second correlation analysis presented the correlation between the indicator of future innovation and digital-driven growth and determinants of current skill gaps, skills in demand and an obstacle for talent development. We confirmed the correlation between the indicator and the skills gap in HR and Marketing business functions, both crucial for knowledge based-development and future business innovation-driven growth. Additionally, we confirmed correlation with analytical skills in demand and explained it through the fact that in the world where data presents new oil, skills that enable the company to transform data into useful business development information are crucial. Our results confirmed that investment in talents is important for future innovation development. We explained the lack of correlation with some skills in demand through the fact that companies in Serbia need more practical skills instead of soft skills for innovation and digital growth.

Keywords: *Serbia, uinnovation, digital transformation, talents, skill gap, skills in demand*

Sažetak

Istraživanje se fokusira na talente i veštine koje su kompanijama potrebne za prelazak ka višem nivou inovativnosti i konkurentnosti u digitalnoj eri. U radu je predstavljena analiza podataka prikupljenih putem onlajn ankete sprovedene među 84 kompanije koje posluju u Srbiji. Urađene su dve korelacione analize. Prva posmatra determinante inovacija i digitalne transformacije među anketiranim kompanijama. Rezultati pokazuju da su ulaganje u istraživanje i razvoj, zajedno sa veštinama upravljanja, statistički značajne i u korelaciji sa svim posmatranim indikatorima digitalne transformacije i inovativnosti. Analiza pokazuje i da kompanije u Srbiji razvijaju više održive nego disruptivne i radikalne inovacije. Druga analiza pokazuje korelaciju između indikatora budućih inovacija i digitalnog rasta, i determinanata koje se odnose na trenutne nedostatak u veštinama, veštine za kojima postoji rastuća tražnja i prepreku za razvoj talenata. Potvrdili smo korelaciju između indikatora i jaza u veštinama u HR-u i marketingu, koje su ključne za razvoj zasnovan na znanju i buduću rast biznisa zasnovanom na inovacijama. Potvrdili smo i korelaciju sa analitičkim veštinama za kojima postoji rastuća tražnja. Pomenuto objašnjavamo činjenicom da su u svetu, u kome podaci dobijaju sve veći značaj, veštine vezane za transformaciju podataka u korisne informacije ključne za razvoj biznisa. Rezultati pokazuju da je ulaganje u talente izuzetno važno za buduću razvoj inovativnosti. Nedostatak korelacije sa određenim mekim veštinama, za kojima postoji rastuća tražnja, objasnili smo činjenicom da je kompanijama u Srbiji potrebno više praktičnih veština za inovacije i digitalni rast.

Ključne reči: *Srbija, Inovacije, digitalna transformacija, talenti, jaz u veštinama, veštine za kojima postoji tražnja*

Introduction

Our research has been conducted in innovation-driven development in the last four years. We have presented the current state of Serbian innovation-driven development, where we emphasized the importance of Research and Development (R&D) and education for such improvement [72]. The conducted research was based on the survey done among high-tech IT companies, and since the investment in Information and Communications Technology (ICT) among companies in Serbia is 0.7% of profit, and far below the global average of 3.5% [80], through the next research, we have moved the focus on digital transformation [73]. We researched companies from the different sectors of the economy to evaluate the challenges they face in this process. Our findings suggest that knowledge and management skills are determinants of main importance for such transformation. Therefore, we researched further the skills in demand among companies and challenges they face in the time of “war for talents” and “talent paradox” [74]. Our findings showed that, on the one hand, companies in Serbia are in a “war for talents”, while on the other hand, there is a presence of talent paradox. Although the unemployment rate among youth in Serbia is one of the highest in Europe, companies have difficulties finding and attracting talents with the necessary skills. Such talent paradox is further loaded with a “war for talents” that transcends local boundaries and becomes global. The latter means that companies in Serbia face both local and global competitiveness in attracting talents since youth in Serbia have ambitions to start their careers in foreign markets. The importance of knowledge and talents for tech and innovation-driven development is further confirmed through our latest research that, among others, had a specific focus on the Tech cluster [75].

This article aims to go further into details and analyze the determinants of innovativeness and digital transformation in companies in Serbia, strongly focusing on talents and skills needed for companies’ leap towards a higher level of innovativeness and competitiveness in the new digital era. The research starts with a literature review in the field of digital transformation and talents

development. The literature review helped us define the indicators and determinants of digital transformation and companies’ innovation. The literature review is followed by the overall framework for innovation and knowledge-based development that shows the strength and weaknesses of the Serbian economy. Then, our survey results are presented, and they involve correlation analysis. We did two correlation analyses. The first one analyses the correlation between innovativeness and digital transformation indicators and their determinants. The other is focused on the correlation between the indicator of future innovation and digital-driven growth and determinants of current skill gaps, skills in demand and an obstacle for talent development.

In the concluding remarks, we present the main conclusions, limitations of conducted research and areas for further research in the field.

Literature review

The global economy is in an era whose development is determined by innovations and new technologies. In such an environment, innovation becomes imperative, and implementing new technologies is the core of business value creation, a critical factor of competitiveness.

Digital transformation is expected to be an even greater imperative for organizations in the short term [27], and digital technologies will have major effects on business [16, 64, 50]. However, according to Tabrizi, Lam, Girard and Vernon [84], digital transformation is one of the major risks, according to the managers and executives, in 2019. Also, the same group of authors points out that 70% of all initiatives for digital transformation do not achieve their goals.

Digital transformation can be defined as an ongoing process of changing how companies operate [22], linked to strategic business changes that yield results based on digital technology implementation [78]. However, little conceptual or empirical research in the current literature examines how organizations are digitally transforming [87, pp. 326-349]. In addition, digital transformation is a new field in the literature, and the academic community has so far paid very limited attention to this area, while the business community attaches great importance to

it given that new technologies have transformed entire industries.

Existing literature defines digital transformation as the use of new technologies [65,15] that create new business models [26, 36 pp. 123-139, 18, pp 1-19], dramatically improve firm performance [90, pp 1-68] and create a better user experience [68, 46, pp. 22-45, 86, pp. 889-901]. Haffke, Kalgovas and Benlian [32] and Horlacher and Schirmer [40] point out that digital transformation strives to improve (digital) sales and communication channels that create a drastic advantage in communication and customer relations.

According to Broekhuizen, Bart, Bhattacharya, Fabian and Haenlein [86], digitalization refers to using digital technologies to improve and create added value for consumers (see also Klötzer and Pflaum [50]). Therefore, digital transformation also refers to developing a new business model [86, pp. 899-901, 32, 36, pp. 123-139, 40, 39, pp.52-61]. However, in addition to answering how companies are digitally transforming, the current literature also lacks an answer on how companies can innovate through a business model. Although business model innovations have reshaped entire industries [66, pp. 617-632, 43, pp.52-60], very few formal studies have been done on the dynamics and processes of business model development [43, pp.52-60]. The foundation for research in this area was laid by Clayton Christensen back in 1997 [17], where the business model is defined as the way a company creates and delivers its value. George and Bock [31, p. 83-111] and Zott, Amit and Massa [89, pp. 1019-1042] emphasize that the business model of innovation is the foundation for achieving the firm's long-term performance. Innovative business models create new markets, new sources of profit, open new opportunities in existing markets [3, 98, pp. 1019-1042], and create new value by changing already established business models in a particular industry [5, pp. 39-56]. Precisely because of this, 54% of senior managers prefer innovation through a business model over innovation through a new product or service to gain a competitive advantage [3].

The dynamics with which digital technologies influence firms to change the way they do business also affect the need for firms to implement digital transformation as part

of their strategy and vision [61 pp. 511-536, 55 p. 340]. Digital technologies alone do not create great value for organizations [44, pp. 1-6], and in that sense, they must be implemented in the value proposition and strategy of the company. In addition to strategy implementation, an important determinant of the success of the digital transformation is the organizational culture and agility of the organization to accept and implement change. Hartl and Hess [35] show that digital transformation requires a change in organizational culture, and because of such, often drastic, changes, leadership plays an important role in communicating tone from the top and influencing the foundation for organizational change [34, pp. 175-185, 37, p. 1855]. In addition to leaders, the bearers of every digital transformation are the people and the teams they make. As drastic changes brought about by digital transformation would not develop fear among employees but a sense of becoming competent for the jobs of the future, the role of leaders in conveying that message is crucial [81, 45]. Hess, Matt, Benlian, Wiesböck [36, pp. 123-139] state that implementing digital transformation in an organization requires a complete change in the skillset among employees and digital skills and talents in the organization are key to implementing digital transformation [21, 50].

Additional to digital transformation, human capital is becoming increasingly important in a world whose development is characterized by achieving competitiveness based on knowledge-driven innovation [82, pp. 122-133]. Such dynamics of development influence both companies and countries to create conditions for attracting, developing and retaining talent.

Although talent and human capital seem to become the focus only with the advent of the Internet revolution, this term was introduced by Adam Smith (1776), pointing out that talent is a treasure for an individual and the country of his residence. Shultz [77, pp. 13-19] defines human capital as the basis for improving firm assets, productivity and competitiveness [8, pp.49-61], which relates to knowledge, education, competencies and skills [63, pp. 381-393, 9, pp. 3-9]. Recent definitions of human capital include the culture and energy individuals invest in creating added value [88, 63, pp. 381-393, 12, pp. 17-33]. While a certain group of authors believe that talents are all

who make up an organization [67, p.12, 12, pp. 17-33, 11, pp. 439-457, 97, pp. 442-445], another group of authors think that talents are a certain group of exceptional individuals [79, pp. 331-338, 91].

Billing, De Smet, Reich, and Schaninger [10, pp. 778-794] point out that companies are exposed to high risks when it comes to talent development and skills building and that now is the time to invest in skills transformation and apply last year's lessons to crystallize their current and future skills need holistically. Since companies face difficulties to find talents, they invest in talent development [29, pp. 5-24, 6, pp. 144-148], and development programs include training [48, pp. 76-91, 19, pp. 63-70], development based on the development of relationships [70, pp. 330-354, 38, p. 133, 56, pp. 219-230] with all relevant stakeholders, and development through the business itself [93, 96, pp.63-95].

In an environment where there is a growing demand for talent, universities are under pressure to respond to these conditions by creating employees with the specific skills necessary to work more efficiently and solve complex tasks [4, pp. 411-422, 89, p. 181-190]. However, Handel [33, pp. 135-160] shows that cognitive skills do not decrease among the younger generations and that differences between what young people possess and what employers are looking for can occur if the need for certain skills increases sharply. Handel [33, pp. 135-160] also shows that the need for new skills is growing, but not faster than before and that employers are dissatisfied with the skills of potential employees, but it is difficult to compare whether this dissatisfaction is greater than before. At the same time, some authors show that the ability of graduates to meet the needs of employers is questionable, and Teichler [83, pp. 171-185] points out that the concern about skills mismatch [71, pp. 1025-1045] in terms of what the economy needs and what graduates have, has never disappeared. The development of technologies further reduces labour demand [7, 84, pp. 16-53, 53, 94] and affects the change in skills that employers expect graduates to possess [60, pp. 43-53], and in this sense, special emphasis is placed on soft skills [69, pp. 453-465], possession of entrepreneurial spirit [49, pp. 510-519], analytical and critical thinking [14, pp. 491-501].

Methodology

The research starts with the overall framework for innovation and knowledge-based development that shows the strength and weaknesses in the Serbian economy based on Global Innovation Index, Global Competitiveness Report and Global Talent Competitiveness Report indicators.

Additionally, for this paper, we have conducted an online survey among 84 companies during December 2021 and the beginning of January 2022. The survey has 41 questions, mostly closed-ended with pre-defined responses or rating scales. The survey was filed mostly by CEOs (37%) and HR/People ops managers (17%). Most of the respondents are male (54%) with master's degrees. The majority of the companies are from the ICT sector (33%), finance sector (20%), manufacturing industry and construction (9%, respectively). The survey was done by both foreign (45%) and domestic companies (55%). Observing by the size, the dominant respondents are large companies (33%), followed by medium (30%), small (25%) and micro-companies (12%). 36% of companies mainly sell on the domestic market, and 31% serve the global market, followed by 25% and 8% operating regionally and on the European market, respectively.

Based on the gathered data, we did two correlation analyses. The first one is between indicators of innovativeness and digital transformation and its determinants. The indicators of innovativeness are set to be: (i) company developed a new product in the last three years, (ii) the new product is new at the existing market where the company is selling its products and (iii) companies' attitude towards their innovativeness in comparison with competitors. The digital transformation indicator is: (i) The company has a digital transformation strategy, which is the first indicator of its awareness to transform its business digitally. The determinants of digital transformation and innovativeness are (i) investment in research and development, (ii) digital strategy implementation, (iii) organizational culture and leadership adoption to new business models, (iv) organizational culture and leadership adoption to digital and innovation development, (v) management skills and knowledge necessary to understand digital transformation. The second correlation analysis has analyzed the correlation

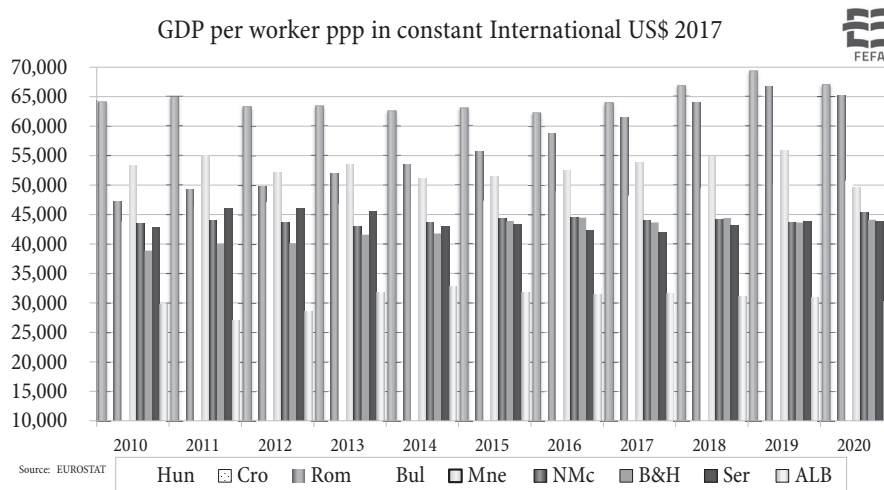
between the indicator of future innovation and digital-driven growth, and determinants of current skill gaps, skills in demand and an obstacle for talent development. The independent variable in this analysis is innovation and digital-driven growth (measured as companies plans to invest in innovation and digital development), and dependant variables are: current gaps that companies have in the functions of (i) HR and (ii) Marketing; skills in demand (iii) Analytical skills and digital competencies, (iv) attitude towards life-long learning, (v) social skills, and (vi) emotional intelligence; and we observed the obstacle for talent development through determinant of (vii) underperformed investments in employees (showing that company lack the budget for employees development).

The overall framework

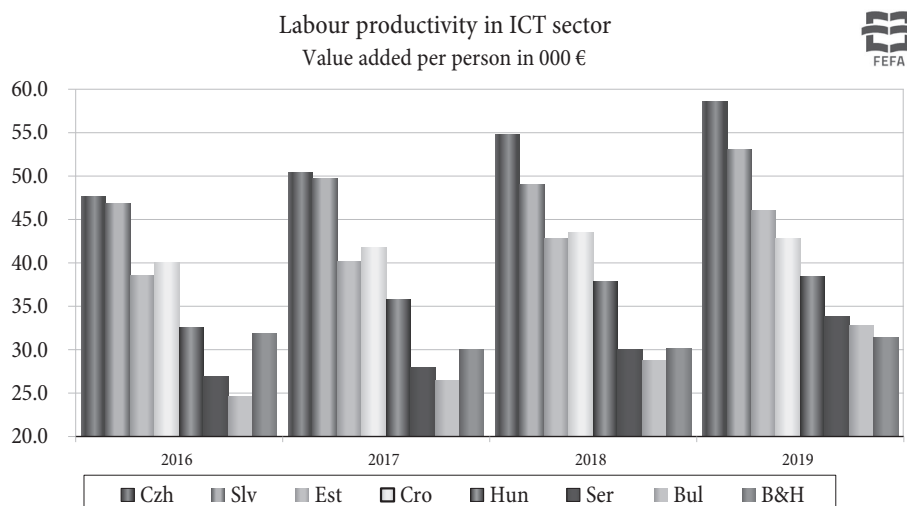
The productivity growth has generally slowed over the past half-century, except for a brief burst during the mid-1990s and early 2000 [62, p. 2]. Also, productivity growth is a precondition for competitiveness improvement, a base for sustainable economic growth and development.

Productivity in Serbia is among the lowest in the region (see Graph 1), and the same reasons for such a state of productivity are still high rates of employment in the public sector and the fact that companies in Serbia need three times more employees for the same production level as a company in EU [94]. Companies in the ICT sector have better results; however, their productivity is

Graph 1: Output per worker in US\$



Graph 2: Labor productivity in the ICT sector



still a third of the EU level if we analyze apparent labour productivity [28].

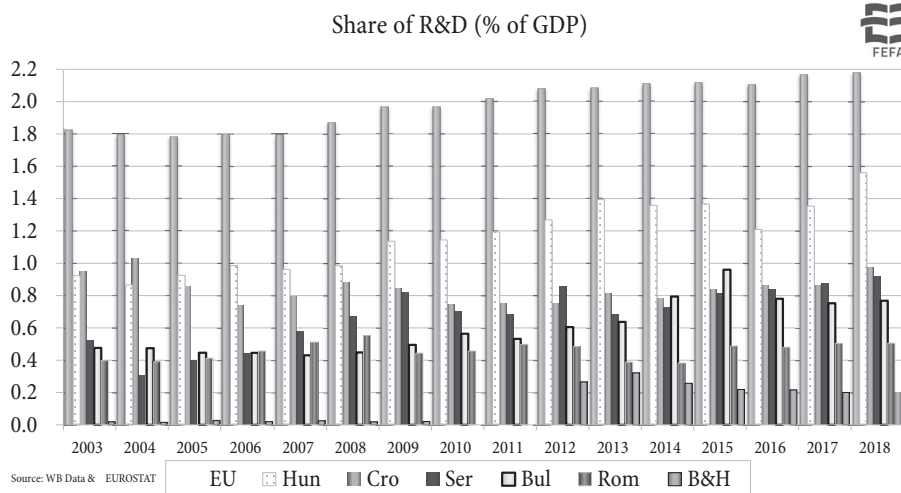
Productivity can be improved by policies that strengthen competitiveness, better access to finance, and improved skills among the labour force [94]. Additionally, higher investments in research and development (R&D) can improve productivity, boosting innovativeness where knowledge plays a crucial role.

According to investments in R&D, Serbia is at the level of neighboring countries but far below the EU average (see Graph 3). The investments in R&D presents the most human and capital-intensive activity in the value chain. Therefore, the economy’s productivity and innovative capacity growth also depend on both private and public R&D investments.

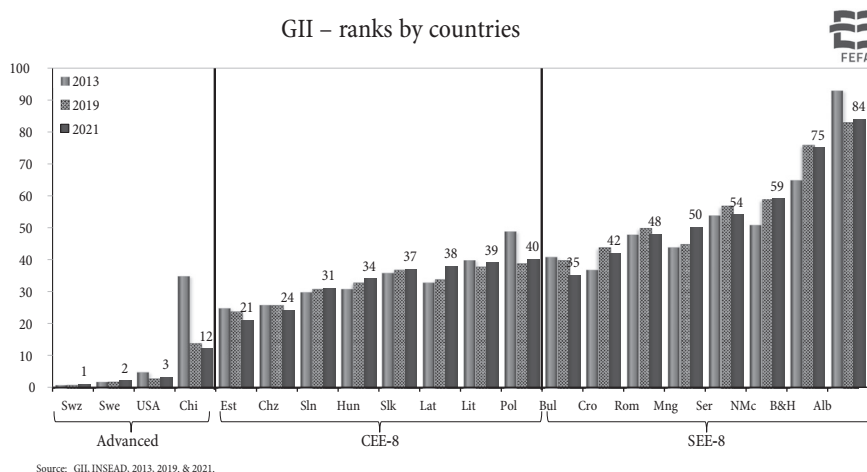
According to Global Innovation Index (GII) data [95, pp. 12-13], there is the growth of total business investment in R&D during the COVID-19, while in the previous two crises (Dotcom 2001, Great Recession 2008), these investments declined along with the fall in GDP.

GII 2021, expressed as a score, is improving in Serbia (Graph 5) and ranks Serbia as 54th within 132 countries (Graph 4). Thus, Serbia managed to catch up with a group of more innovative countries in the region, such as Bulgaria (35), Croatia (42), Romania (48) and Montenegro (50). As innovation is an important component for achieving sustainable growth and reducing the difference in the level of development compared to developed countries, it is necessary to find the key areas for improving innovation indicators of the Serbian economy.

Graph 3: R&D investments as a % of GDP



Graph 4 GII Ranks by countries



Serbia's GII (54) is better than Serbia's Global Competitiveness Index (GCI) (72) and GDP per capita PPP (75). As the GII consists of two components (innovation inputs and innovation outputs), the data indicate that Serbia had significantly improved its inputs and now ranks as 50th in the world compared to two years ago when it was at 62nd place. However, the ranking by output was maintained at 57th place (Graph 6).

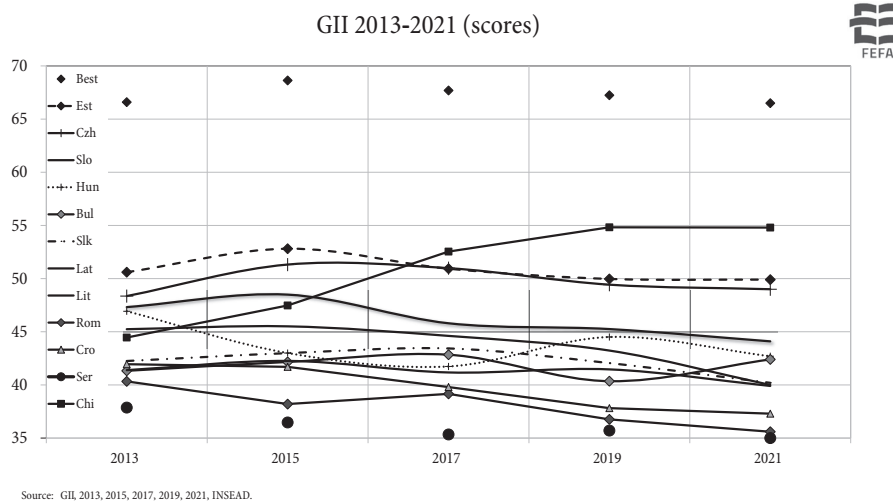
Within the innovation inputs, the most important segments for improvement are:

- (i) improve the quality of human capital by increasing overall and government investment in education and
- (ii) raise the level of business sophistication by investing in knowledge and innovation linkages based on clusters.

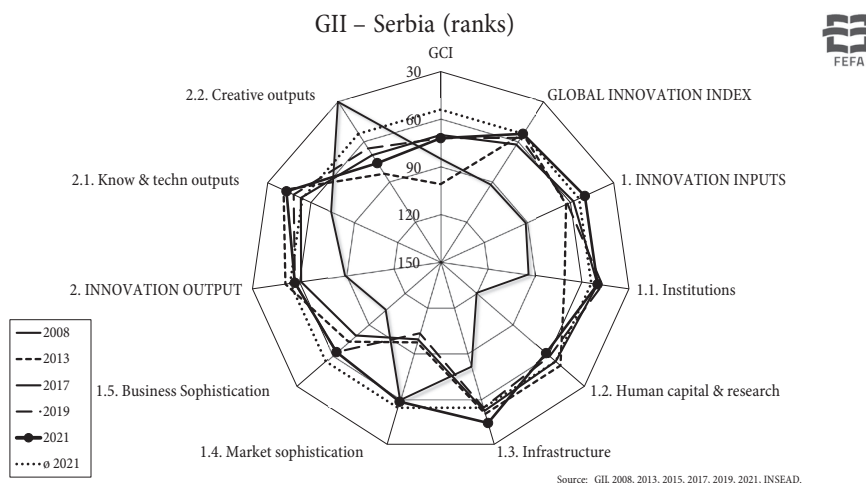
Serbia is achieving good results in education coverage, while the quality and output of education are still not at a satisfactory level. The supply of education and the economy's demand is still not harmonized, which is one of the reasons for the high youth unemployment and the high percentage of those who become NEET (not in education, employment, and training).

The quality of math and science are important inputs for innovation-driven development. The fact that Serbia has a strong position according to this indicator presents one of the main competitive advantages. However, the problem arises when such talents need to be retained in the country, and according to that criterion, Serbia is one of the worst-ranked countries globally, ranking in 126th place (GTCI). Serbia's competitive position deteriorates if the focus shifts from technical to business knowledge.

Graph 5 GII 2013-2021 (Scores)



Graph 6 GII – Serbia (ranks)



Given that innovations are part of products and services and business models themselves, there is a need to create quality and agile staff with business knowledge to present and offer value in the market and contribute to companies' growth and business development.

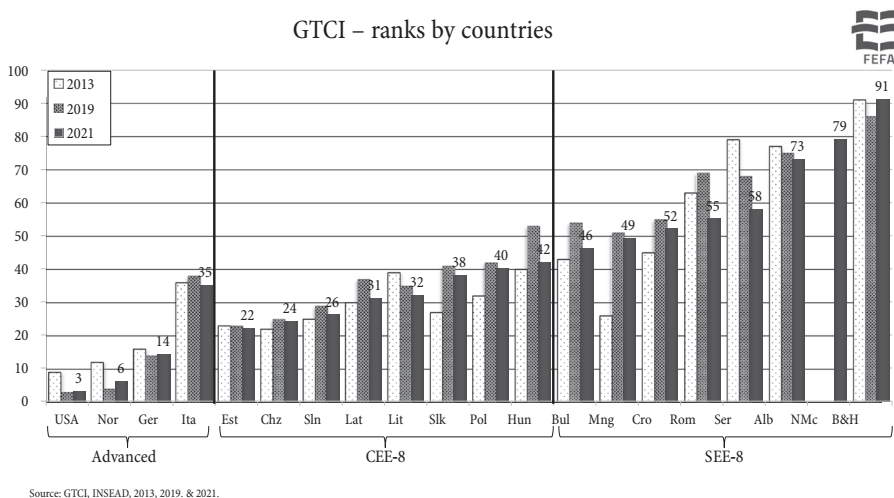
The other area for improvement is related to business sophistication and overall cooperation.

Business sophistication is determined by knowledge workers, innovation linkages and knowledge absorption. Although Serbia has a competitive advantage in knowledge-intensive employment (53rd, GII), there is still room for improvement. According to Eurostat [28], if we look at high-tech products export, which in Serbia counts for 1.9% of total export compared to the EU, presenting 17.9% of total export, we can conclude that some changes are

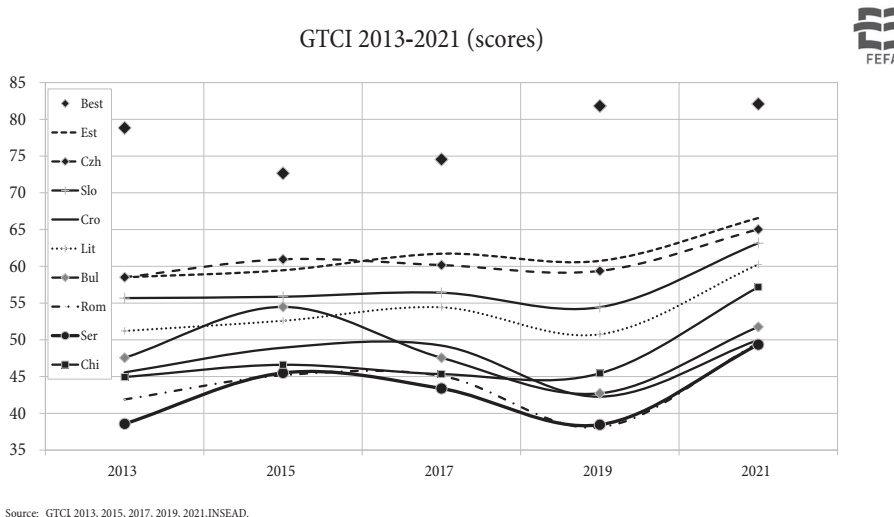
still necessary. The cause of such results is also related to low levels of R&D investments. Additionally, Serbia ranks 75th globally according to the high-tech products import indicator (GII). The Serbian economy still doesn't have high exposure to high-tech products because of the low level of local investments and insufficient level of such products import. The latter represents an important area to be improved for both local demand and business sophistication.

In the dynamic environments in which companies are developing today, the existence of cooperation is important for the development of innovation, bearing in mind that achieving fundamental change in the market is difficult by one isolated company [1, pp. 39-58, 92, 76, pp. 197-213]. However, the comprehensive cooperation between

Graph 7 GTCI – Ranks by countries



Graph 8 GTCI 2013-2021 (Scores)



companies in Serbia is very low. Some improvements in this field are spotted in the tech sector within the Serbian economy. Research conducted among startups shows that the founders of Serbian startups are better connected globally than the average founder of startups worldwide. Such a result can be partly attributed to the large Serbian and ExYu diaspora [51]. However, the same research shows that the Belgrade and Novi Sad ecosystems lag the world average regarding local connectivity and how they help each other. Additionally, the quality of those relations, in general, is lower than the world average.

It is most important to improve the Creative output within the innovation output. According to this indicator, the causes of low rank are connected to the uncompetitive positions of Intangible assets, and above all, Trademarks, ICT and organizational model creation and Global brand value. As mentioned in the introduction, the investment in ICT among companies in Serbia is 0.7%, far below the global average of 3.5% [80] and presents an area for improvement for overall digital and innovation capacity lifting. There are several globally recognized brands and success stories from the Serbia market regarding the global brand value, and some have improved the location attractiveness based on strong brands and business success. This laid the foundation for further increase of the global brand value of companies in Serbia that will be determined by the ability to innovate and bring unique value to the market.

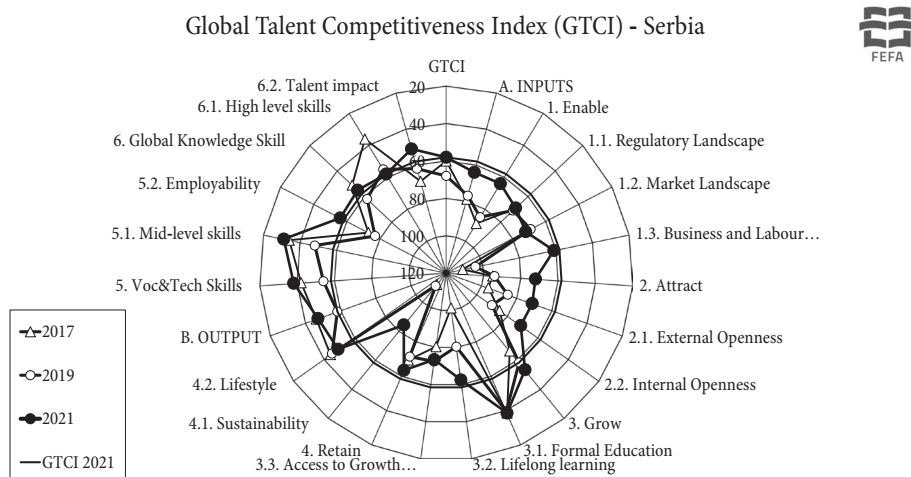
Considering that R&D also presents human-intensive activity, the importance of knowledge and skills among employees is unequivocal when creating an innovation output.

Global Talent Competitiveness Index (GTCI) 2021 expressed as a rank is improving in Serbia (58) (in 2013 it was 79th and in 2019 it was 68th). However, when looking at the GTCI by score, the decline in scores in Serbia in the period 2013-2019 is noticeable, followed by a recovery in 2021 (Graph 7 and 8), indicating the need for higher investments in both talent development and retention.

The position of Serbia, according to GTCI (58) [95], is better compared to its position among the Global Competitiveness Index (72) and GDP per capita PPP (75), but worse than GII (54). The GTCI consists of two components (inputs and outputs). The data indicate that Serbia has significantly improved its inputs and has a stable position in the output (Graph 9). The presented also indicates the necessity for improvement in both segments of this indicator, with the following four problems standing out in particular: brain retention (126), brain gain (124), social mobility (111) and employee development (111).

Serbia is among the worst-ranked countries when it comes to attracting talent on the one hand and retaining them on the other. The migration trend that existed in the 1960s and 1970s was primarily related to the departure of lower-skilled labour. However, today this trend implies the departure of talent (such as engineers, health workers,

Figure 8 GTCI - Serbia



etc.), not only for higher wages but also for employment opportunities, higher quality of life and pursuance of more productive jobs. Low rank of social mobility means that it is still hard to improve the social and economic status based on personal efforts regardless of the socio-economic status of parents, which is related to inequalities of opportunities. Low employee development has roots in the low level of companies' investments in employee training. Although our previous research results [74, pp. 75-89] showed that companies are very dedicated to staff development, the low rank of the Serbian economy according to this indicator implies that other economies are investing more.

Innovation and digital transformation

We have analyzed the correlation between innovativeness and digital transformation indicators and their determinants (See Table 1).

Regarding the company's innovativeness by new product development, we observe that this indicator is in correlation with investment in R&D which mostly include human and capital-intensive activities in value creation. Within the sample, 76% of the companies invested in R&D in the past three years, and most of the companies that invested in R&D were large enterprises. Possibly, one of the main reasons why SMEs were investing less in comparison to larger companies could be related to current pandemic conditions. For instance, small businesses within COVID

conditions were more focused on liquidity problems, and most of the financial funds were invested in covering operating costs, showing a high level of financial fragility. Additionally, within Deloitte study [24] related to SMEs and their innovation activities, the results imply that 72% of German SMEs have experienced constraints: 1) financial constraints; 2) insufficient R&D, especially in comparison to large enterprises and 3) shortage of skilled labour. These results partially correlate with our survey, where 63% of SMEs finance innovation internally. The latter may imply financial constraints to external financing imposed by the financial institutions, meaning that banks implement restrictive credit policies towards SMEs, charging higher fees and interest rates and demanding higher collaterals, perceiving them as risky investments. Banks consider small businesses to be opaque in terms of financial condition with a lack of appropriate collateral, assessing their credit trustworthiness to be lower in comparison to large companies.

The lack of correlation between new product development and digital strategy implementation and organizational culture and leadership adoption to digital and new business model development could be related to the fact that surveyed companies innovate through significant product's improvement while still lacking innovativeness through business model innovations.

As has been already mentioned, the dynamics related to digital technologies' urges the companies to change the way they do business, affecting the need of the firms to

Table 1: Indicators and determinants of innovativeness and digital transformation

Innovativeness and digital transformation indicators	Development of new product		Digital transformation strategy		Innovative in comparison with competitors		New product is new on the market	
	Chi-square	Cramer's V	Chi-square	Cramer's V	Chi-square	Cramer's V	Chi-square	Cramer's V
Determinants of innovation and digital transformation								
Investment in R&D activities	9.439 (**)	0.335 (**)	1.676	0.141	5.600 (*)	0.258 (*)	5.901 (*)	0.265 (*)
Digital strategy implementation	1.248	0.122	68.918 (**)	0.906 (**)	4.861 (*)	0.241 (*)	1.365	0.127
Organizational culture and leadership adoption to new business models	2.013	0.155	9.164 (**)	0.330 (**)	4.148 (*)	0.222 (*)	1.474	0.132
Organizational culture and leadership adoption to digital and innovations development	1.666	0.141	14.096 (**)	0.41 (**)	9.833 (**)	0.342 (**)	4.227 (*)	0.224 (*)
Management have skills and knowledge necessary to understand digital transformation	6.403 (*)	0.276 (*)	11.494 (**)	0.370 (**)	4.271 (*)	0.225 (*)	4.103 (*)	0.221 (*)

Source: Survey results and author's calculation

(*) indicates a correlation where the significance is less than 0.05, while (**) indicates a correlation with a significance less than 0.01.

implement digital transformation as part of their strategy and vision [61, pp. 511-536, 55, pp. 339-343]. Suppose we observe the indicator of digital transformation. In that case, we see the strong correlation with all determinants, except with investment in R&D. This could be related to the fact that the most important determinants of successful digital transformation are related to strategy implementation, leadership and management, and organizational culture and agility of the organization to accept and implement change as it is presented in the literature review [35, 34, pp. 175-185, 37, pp. 1854-1864].

Although management skills correlate with digital transformation, SMEs need to improve this determinant and boost the leap towards digital transformation. While many organizations define a digital strategy as a formal document, they lack a common language to strategize across functions that will enable C-suite executives beyond the CTO (Chief technology officer) or CIO (Chief information officer) to have tech-adjacent communications [25]. The lowest grades 1-3 (within the scale 1-5), related to whether management has the knowledge and skills necessary for digital transformation, were given by SMEs. Apart from management skills, SMEs were the most dominant in giving lower grades to adjustment of organizational culture and leadership to new business models. This is very important, bearing in mind that innovative business models can create new markets, new income sources and create new opportunities [3, 98, pp. 308-325]. Ibarra, Bigdeli, Igratua and Ganzarain [42, p. 76] emphasized that for SMEs, the development of new business models based on new technologies strongly depends on 1) long-term managerial orientation; 2) clearly defined strategy based on collaboration with all the relevant stakeholders with a focus on customer needs; 3) open innovation that involves free flows of knowledge related to both market needs and the potential of technologies, simultaneously collaborating with the customers. Improving those determinants could bring digital transformation to the centre of business value creation among SMEs and consequently strengthen competitiveness.

If we look at the companies' attitude towards their innovativeness compared to others, we can spot the correlation with all determinants. The correlation with

R&D is not surprising at all, since R&D is correlated to new products development and those new products were new at the global market in more than 60% of cases, mostly dominated by large companies (with 55% of this share for large companies, and 45% of SMEs). Such results are encouraging and present surveyed companies' ability to gain competitiveness within the conditions of fierce competition. The indicator of innovativeness in comparison with others is correlated with other determinants, which confirmed the importance of innovativeness and digital transformation introduction in the core of organizational culture.

Finally, the indicator that shows that a new product is new on the market where the company operates correlates with all determinants except strategy implementation and organizational culture and leadership adoption to new business models. R&D is correlated with this indicator, and 70% of companies that invest in new products development, export their product to the foreign markets (regional and global market). The companies within the survey claiming that they did not develop a new product for the market are mainly focused on the domestic market, without exporting to global markets. These results are very important, and they correlate with the findings of Manon, Mauricio and Christophe [54], who emphasized that innovative firms are more likely to be involved in international markets than non-innovative companies. Finally, most respondents who stated that they developed a new product for the markets invest in R&D (85%).

The lack of correlation between indicator that shows that a new product is new on the market with digital strategy implementation could be related to the fact that strategy implementation is more related to the processes in the company instead of the new product development. Finally, the lack of correlation between indicators that shows that new product is new on the market and organization culture and leadership adoption to new business models could imply that companies in Serbia are developing more sustaining than disruptive and radical innovations, meaning that significant products improvement are leading to competitiveness in the current market. Since the new business models change the number of industries, improving the companies' ability to bring

new value to the existing markets can further improve their competitiveness position and strength foundation for the firm's long-term performance, as stated in the literature review [99, pp. 1019-1042].

Importance of talents for innovation and digital-driven growth

Companies have difficulties in employing high-quality staff in general. Most of the surveyed companies consider that our education system does not meet the needs of the companies concerning innovation-driven growth. Only 2.4% of companies believe that the education system prepares a workforce that will meet the needs of innovation-driven growth. Moreover, 65% of companies state that they lack adequate staff when striving for growth based on innovation. This is in line with McKinsey report: *Beyond hiring: How companies are reskilling to address talent gaps* [57], where 87 % of responders say they are experiencing gaps concerning adequate staff and skills mismatch now or expect them within a few years. Within our sample, 83% of companies believe that developing new technologies will drastically change companies' skills in the coming period.

Since education does not meet companies needs for skills and knowledge on the one hand, and since the digital technologies will drastically change the skills the companies will need, we did the correlation analysis to see where the existing gaps are and demands in skills when it comes to innovation-driven growth.

We have analyzed the correlation between the indicator of future innovation and digital-driven growth and determinants of current skill gaps, skills in demand and an obstacle for talent development (See Table 2).

As presented in Table 2, there is a correlation between gaps in HR business function and innovation and digital-driven growth. On the one hand, talents play a crucial role since companies cannot make a profit without talented individuals in knowledge-based development [85, 30, pp. 225-237]. The correlation with a skills gap in HR shows that a company's ability to find, attract and retain talents is of the main importance in the time of "war for talents", which refers to fierce competition in attracting and retaining talent in companies [47]. It is when McKinsey introduces the notion of the talent war, attracting and retaining talent in an organization, that it becomes increasingly important [23] and one of the highest-ranked challenges among CEOs [13], which, if overcome, creates positive effects for an organization [52, 20]. The correlation between gaps in marketing skills among companies and the observed indicator could be related to the companies' needs to strengthen the business growth and development and expand their market potential further. Marketing skills will also be further in demand, as stated in McKinsey Report [57] on labour market trends after the COVID-19 pandemic, where it is pointed out that marketing, E-commerce, and other virtual transactions related to sales are booming.

What stands out in our survey is that 68% of companies, regardless of sectors and sizes, believe that

Table 2: Importance of talents for innovation and digital-driven growth

Indicator of innovation and digital driven growth	Future innovation and digital-driven growth	
	Chi-square	Cramer's V
Determinants of current skill gaps, skills in demand and obstacle for talent development		
HR (gap)	13.273 (**)	0.398 (**)
Marketing skills (gap)	6.365 (*)	0.275 (*)
Analytical skills and digital competencies (in demand)	4.416 (*)	0.229 (*)
Attitude towards life long learning (in demand)	2.532	0.174
Social skills (in demand)	1.672	0.141
Emotional intelligence (in demand)	1.081	0.113
Underperformed investment in employees (obstacle)	7.889 (**)	0.306 (**)

Source: Survey results and author's calculation

(*) indicates a correlation where the significance is less than 0.05, while (**) indicates a correlation with a significance less than 0.01.

our education system will not be able to meet the needs for these skills in the next 2-3 years.

Further, 30% of the surveyed companies pointed out that analytical skills and digital competencies are the skills they will need most due to the disruptions that new digital technologies will bring to their operations. Those skills correlate with the observed indicator, which is not surprising since we live in a world where data present the new oil. In such a world, skills that enable the company to transform data into useful business development information are crucial.

Similarly, when looking at the specific skills with the greatest mismatch between the education system and what will be necessary for the next five years, respondents expect skill gaps to open during that time and attitude towards life-long learning. The importance of this skill for innovation and digital-driven development needs, as McKinsey states [57], to become must the new norm if organizations want to stay ahead. However, this skill, together with social skills and emotional intelligence as skills in demand, are not correlated to the observed indicator. This could be related to the fact that companies in Serbia still do not consider those skills the most important for innovation-driven growth and need more practical skills (such as analytics) in the current state of development.

The significant share of surveyed companies (39%) allocates between 1-3% of total revenues to developing skills that are key to an innovation-based growth strategy. However, the correlation results show a relationship between underperformed employee investments and observed indicator. The result is not surprising, considering that skills among employees represent one of the main determinants for innovation-driven growth. Therefore, the prospect for such growth is related to the current obstacle and need for greater budgets and investments in talent development since they represent one of the key determinants for innovation-driven growth.

Additional to the correlation analysis, we have prepared the results showing how the COVID-19 crisis have affected the companies needs for talents. As observed in the Mc Kinsey Global Institute survey [57] on the future of work after the COVID-19 pandemic, COVID-19 may propel faster adoption of new technologies and

AI, especially in work areas with high physical proximity. Agrawal, De Smet, Lacroix, and Reich [2] point out that the digitalization of COVID-19 introduced teleworking, which dramatically accelerated the need to develop new workforce skills. Companies exhibited extraordinary flexibility and adaptability in responding to our sample's innovation-based growth pandemic. However, 70% responded that the COVID-19 pandemic did not significantly affect the need to internally improve the skills necessary for innovation-based growth.

Interestingly, 52% of the surveyed companies significantly increased the number of employees (over 10%) during the pandemic, while the rest of the surveyed companies (48%) did not significantly reduce the number of employees during the pandemic peak. It implies either that companies have adapted well to pandemic conditions or that the need for specific skills has increased during the pandemic due to changing market conditions. If we analyze companies by their size, we conclude that, to the greatest extent, large and medium-sized companies have significantly increased the number of employees (over 10%). This growth has spilt over to hiring employees who possess the skills necessary to work in the digital world, including creativity, digital communication, and digital skills.

Conclusion

This research focuses on talents and skills needed for companies' leap towards a higher level of innovativeness and competitiveness in the new digital era.

We confirmed that R&D investments and management skills are correlated and significant for all observed digital transformation and innovativeness indicators. Our research showed that R&D investments correlate with all observed innovation indicators but are not correlated to the digital transformation of companies. The correlation with innovation indicators is expected since R&D investments present the base and determinant of main importance for innovation-driven development. We explained the lack of correlation between R&D and digital transformation through the fact that the most important determinants of successful digital transformation are more related to strategy implementation,

leadership and management, and organizational culture and agility of the organization to accept and implement change. Therefore, the correlation between management skills and digital transformation and all innovativeness indicators is expected since knowledge plays a crucial role in innovation development, and management skills are of the main importance for organizational culture adoption to digital transformation.

Our correlation analysis showed the lack of correlation between some determinants of organizational culture and digital strategy implementation, and indicator of innovation presented through new product development, and the fact that new product is new on the market. We explained that the lack of correlation with digital strategy implementation could be related to the fact that strategy implementation is more related to the processes in the company instead of the new product development, while the lack of correlation between this indicator and organization culture and leadership adoption to new business models could imply that companies in Serbia are developing more sustaining than disruptive and radical innovations.

We also confirmed that current skill gaps, one demanded skill, and talent development obstacle correlate with future innovation and digital-driven growth. The research results confirmed that gaps in HR and Marketing are correlated to the observed indicator and are crucial for future business growth and development based on innovation. We confirmed the correlation between all observed determinants and an indicator, except for some skills in demand. We explained the lack of correlation with skills in demand related to attitude towards life-long learning, social skills, and emotional skills in demand by explaining that companies in Serbia need more practical skills than soft skills. We emphasized the importance of analytical skills and investment in talent development for future growth based on innovation.

The research has its limitations which open opportunities for future research in the field. The limitations are primarily in special talent management techniques and practices that companies in Serbia implement to develop talents. In that sense, future research can focus on the field of internal practices that companies conduct for this purpose. The topic of brain drain is mentioned in this paper as the cause

of certain challenges. However, there is room for research analyzing the effects of brain drain on long-term economic and social growth and development based on innovation. When it comes to digital transformation, the researchers observed only one indicator, and further research can be focused on identification and indicators analysis at a different level of digital transformation maturity. Finally, the transformation and modernization of the education system according to the needs of the current and future economy is a special topic, which requires and opens the possibility for new research in terms of more specific needs, ways and effects of transformation.

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