

розвиток власної особистості і задоволення своїх потреб; орієнтація на згуртування для вирішення загально важливих і значимих питань.

Цифрова трансформація світу зумовила пришвидшення зміни тенденцій до вибору професій майбутніх спеціалістів, а тому виникла потреба у поєднанні декількох різних за специфікою компетенцій та вмій для реалізації себе у економічному середовищі не лише як бізнесмена, а ще й як новатора.

Список використаних джерел:

1. Generations X,Y, Z and the Others [Електронний ресурс]. – Режим доступу: <http://socialmarketing.org/archives/generations-xy-z-and-the-others/>
2. This Is What Generation Z Wants From The Workplace [Електронний ресурс]. – Режим доступу: <https://www.forbes.com/sites/christinecomaford/2017/04/22/what-generation-z-wants-from-the-workplace-are-you-ready/#49b4c44453ef>
3. Дуглас Адамс – 3 правила, которые описывают наше отношение к новым технологиям [Електронний ресурс]. – Режим доступу: <http://gearmix.ru/archives/16458>
4. Поколения ЯЯЯ [Електронний ресурс]. – Режим доступу: https://www.youtube.com/watch?v=tKjuIhhvLSQ&list=PL9TjF2JoBvRZDWd1hVxt2whh_vxbVWPQw_&index=2&t=740s
5. Професії майбутнього: які спеціалісти будуть затребувані завтра [Електронний ресурс]. – Режим доступу: <https://life.pravda.com.ua/columns/2019/02/19/235691/>

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THE IMPACT OF INDUSTRY 4.0 AND NEW TECHNOLOGY TRENDS IN STRATEGIC MANAGEMENT

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Abstract

It is evident that in the concept of Industry 4.0 the pace and intensity of the development of new technologies are increasing. The impact of the transformation of new technologies is not only increasing in the field of strategic management, but also in all other aspects of modern business. New technologies have created new consumer needs and new market segments, which have influenced the necessity of strategic paradigm' change so the enterprises could adequately respond to modern business challenges. Bearing in mind the above facts, the purpose of this paper is to analyze the implementation of new technology trends in some European countries and point out their impact on strategic management.

Keywords: Industry 4.0, new technologies, strategic management, European countries.

Introduction

Since the beginning of industrialization, technological leaps have led to the crucial shifts that are called "industrial revolutions". It happened first in the field of mechanization (the first industrial revolution), then with the intensive use of electricity (the second industrial revolution) and widespread usage of information technology (the third industrial revolution). Based on the ever-present process of advanced digitization within factories, a combination of Internet technologies and new technologies in the field of "smart" objects, it can be noticed that the new change of paradigm in industrial production is beginning. In the future production, integrated, modular and efficient production systems stand out [1]. Those production systems are characterized by the fact that the products are capable, to some extent, to control their own production process. In these expectations of the future of production and service systems, the term "Industry 4.0" has been established to denote the forthcoming fourth industrial revolution [1].

The term called "Industry 4.0" focuses on the development and vertical and horizontal integration of small and medium-sized technology-oriented organizations in the manufacturing sector.

This concept "aims to provide continuous and clear insight into all phases of production by applying Information and Communication Technologies (ICT) to vertically and horizontally import manufactures, and to enable product monitoring and improvement throughout product lifecycle" [2].

Peter Drucker, one of the most famous authors in the field of strategic management points out that the development of new technologies drastically affects the transformation of strategic management [3].

"The transformational impact of new technologies on strategic management is fundamentally based on the growing importance and intensification of information gathering, especially: information on the rate of development and diffusion of new technology; the rate of substitution of one technology by a new technology; information on the frequency of technological innovation and the time required between the invention and its commercialization, all in order to anticipate and make optimal strategic decisions more successfully, with the purpose of achieving a sustainable competitive advantage." [4].

Purpose of the research

The fourth industrial revolution presents a change in the industrial sector: everything evolves from a pre-planned and sequential process to an organizational, self-organized logistics system. Digital technologies such as the Internet of things (IoT), Robotics, Cloud Computing, Cyber-Physical Systems, and Big Data, are the key to implementing Industry 4.0. Industry 4.0 involves the complete digitalization of all production processes and the implementation of the aforementioned digital technologies when creating an idea of a product, product engineering, production organization, production realization, process control and the provision of industrial services. Industry 4.0, as the fourth industrial revolution, has already begun and is ongoing in many countries, and this ensures the survival of the industry and its competitive development in modern conditions.

Because of the faster, more intense and more frequent development and application of new technologies in all areas of business, but also the increasing transformational impact on change of paradigm of strategic management, as well as on the functioning of the global economy, many authors in the field of strategic management and the fields of new technology and information technology development point out that the world is currently in an era of high-tech or digital revolution. The high-tech or digital revolution is one of the most significant things happening to humanity and involves "drastic changes caused by the rapid introduction, but also the replacement of new technologies." [5].

Bearing in mind the above facts, the purpose of this paper is to analyze the implementation of new technology trends in some European countries and point out their impact on strategic management.

Results of the research

The graph in Fig. 1 shows the high and low estimates of the impact of Information and Communication Technologies (ICT) on industrial growth in some European countries, so it can be concluded that the largest incremental growth of GDP due to adoption and utilization of ICT, is evident in all sectors of economy [6].

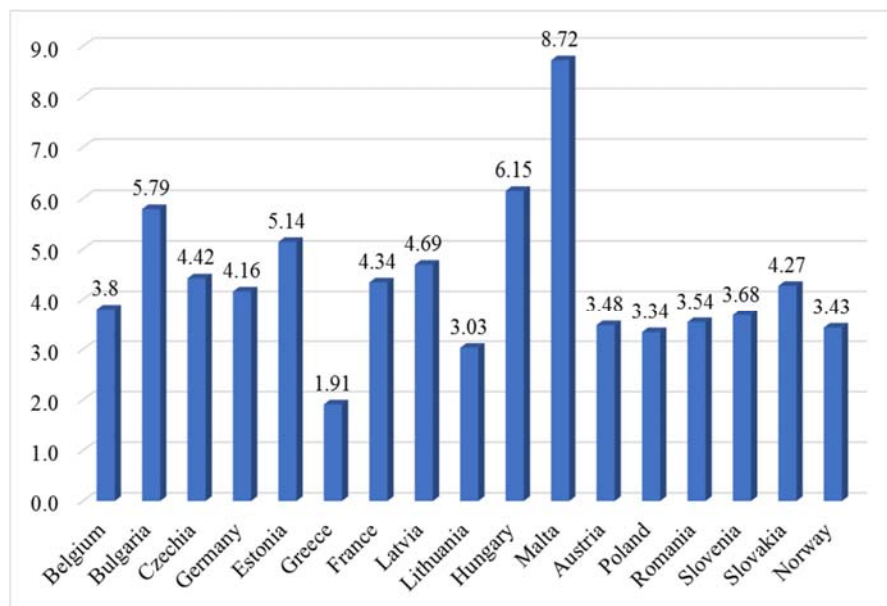


Fig. 1. Percentage of the ICT sector in GDP in 2018 (*Source: Eurostat database*)

As can be seen in Fig. 1, the largest impact of the ICT sector on GDP growth in 2018 was in Malta, Hungary, and Bulgaria, while the least was in Greece, Lithuania, and Poland.

Considering that the core of the Industry 4.0 concept is composed of several advanced digital technologies that largely initiate and enable the successful transformation of the existing business models, the percentage of total enterprises in some European countries that use Cloud Computing services and Big Data analysis is given in Table 1 and Fig. 2.

Cloud Computing is an infrastructure that can deliver great value because of its ability to deliver computing resources as a service. One of the most important features of Cloud Computing is

scalability, and the key technology that enables it is virtualization [7]. As it is stated, Cloud Computing services are one of the keys to implementing Industry 4.0, so the participation of enterprises that use Cloud Computing services is a very important task that will contribute to the successful transformation of their business models. As can be seen from Table 1 Finland, Sweden and Denmark are the countries that have the highest percentage of enterprises that bought Cloud Computing services in 2018, while Bulgaria, Turkey, and Poland had the lowest percentage of enterprises that use Cloud Computing services.

Table 1. Percentage of enterprises that bought Cloud Computing services in 2018 (*Source: Eurostat database*)

Country	Cloud Computing services	Country	Cloud Computing services
Belgium	40	Malta	37
Bulgaria	8	Netherlands	48
Czechia	26	Austria	23
Denmark	56	Poland	11
Germany	22	Portugal	25
Estonia	34	Romania	10
Ireland	45	Slovenia	26
Greece	13	Slovakia	21
Spain	22	Finland	65
France	19	Sweden	57
Croatia	31	United Kingdom	42
Italy	23	Norway	51
Latvia	15	Montenegro	18
Lithuania	23	Serbia	15
Hungary	18	Turkey	10

Another digital technology that has been analyzed in this research is Big Data. "It is an analytical model for processing large amounts of different formats of data, and transmits the focus of business focus, from product manufacturing to value delivery." [2]. The diagram in Fig. 2 shows the percentage of enterprises in European countries that analyzed Big Data from any data source in 2018. The highest percentage of enterprises had Malta, Netherlands, Belgium and Ireland (24%, 22%, 20%, and 20%, respectively), while the lowest percentage of enterprises had Hungary, Austria, Bulgaria, and Italy (6%, 6%, 7%, and 7%, respectively).

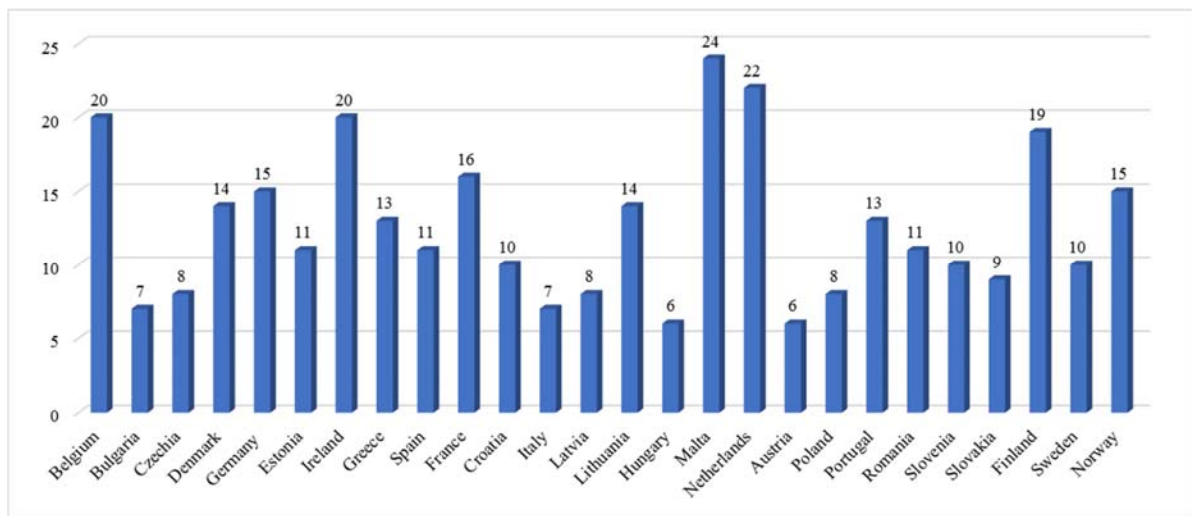


Fig. 2. Percentage of enterprises analyzing Big Data from any data source in 2018 (*Source: Eurostat database*)

Conclusion

“The enterprises that are the last to go through the application of the concept Industry 4.0 and through the digitization of all business processes will be the first to disappear from the business scene”[2]. The research presented in this paper has shown that economically developed European countries are significantly more successful in applying the concept of Industry 4.0 and new technology trends. All of the above indicates that the development and application of digital technologies like Cloud Computing services and Big Data analysis are one of the most significant generators of change in the modern economy, but also in the field of strategic management. The results of research presented in the paper confirm that the countries that use digital technologies the most are the most developed European countries.

References

1. Šešlija, Dragan, Milenković, Ivana, Doroslovački, Rade, Katić, Vladimir, Vilotić, Dragiša, Kolaković, Srđan, and Kovačević, Ilija. Od digitalne proizvodnje do digitalnog obrazovanja – From digital manufacturing to digital education. Zbornik radova XXIV skupa „Trendovi razvoja: Digitalizacija visokog obrazovanja”, Kopaonik, No. UP. 1-2, pp. 1-5, 2018

2. Ilić, Dejan, Marković, Branko, and Milošević, Dragan. Strategic business transformation: An Industry 4.0 perspective. *International Journal of Economic & Law*, Vol. 7, No. 20, p.p. 49-59, FPSP, Belgrade, 2017

3. Bešić, C, Đorđević, D. Benčmarking, Tehnički fakultet, Čačak, str. 22-25, 2007

4. Ilić, Dejan, Marković, Branko, and Ivannikov, Nikolaj. Uticaj novih tehnologija na transformaciju strateškog menadžmenta - Impact of new technologies on transformation strategic management. Zbornik radova nacionalnog naučnog skupa „Savremeni problemi strategije i strateškog menadžmenta”, Fakultet za strateški i operativni menadžment i Fakultet za poslovne studije i pravo, Univerzitet "Union - Nikola Tesla", Beograd, str. 57-69, 2017

5. Bostrom, Nick. Technological Revolutions: Ethics and Policy in the Dark. *Nanoscale: Issues and Perspectives for the Nano Century*, eds. Nigel M. De S. Cameron and M. Ellen Mitchell, John Wiley, pp. 129-152, 2007

6. Karabegović, Isak, Karabegović, Edina. Implementacija „Industrije 4.0” primjenom robota i digitalne tehnologije u proizvodnim procesima u Kini. *Tehnika – Mašinstvo*, vol. 67, br. 2, pp. 224-231, 2018

7. Dong, Bo, Zheng, Qinghua, Yang, Jie, Li, Haifei, and Qiao, Mu. An E-learning Ecosystem based on Cloud Computing Infrastructure. *Proceedings of the Ninth IEEE International Conference on Advanced Learning Technologies*, IEEE Computer Society, pp. 125-127, 2009

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**ALTERNATIVE APPROACHES FOR RESEARCH ASSESSMENT STRATEGIES IN THE
BUSINESS OF HIGHER EDUCATION**

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Abstract