The Impact Of Digital Transformation On The Country's Social Progress

Jana Hornungová, Kateřina Petrová

Abstract

Purpose of the article: The purpose of this paper is to investigate whether there is a relationship between the level of digitalisation and social stability (satisfaction) in EU countries through two main indices. There are many predominantly benefits associated with digitalisation, which can be at the macro, micro, and personal level of the individual. For example, economic growth, increasing productivity, well-being for people or better transparency.

Methodology/methods: The DESI and WHI index data, as well as the GDP per capita, were analysed using statistical methods, specifically Pearson's correlation coefficient and regression analysis.

Scientific aim: The aim is to identify the relationship between the DESI and WHI and then determine the relationship between these indices and the GDP per capita.

Findings: According to the basic statistic results, the highest value of the DESI and WHI indicator was obtained in Finland. Luxembourg had the highest reported GDP per capita. The lowest results were achieved in Romania (DESI) and Bulgaria (WHI and GDPC). A strong positive relationship was found across all relationships analysed (DESI-WHI, DESI-GDPC and WHI-GDPC). In the case of DESI and WHI, the model captures 64.9% of the data; in the case of DESI and GDPC, 46.7%, and in the case of WHI and GDPC, the model reflects 58.9% of the data. For all combinations, a regression function was determined to be linear and increasing. Thus, it means that for all combinations, if one variable increases, the other variable will also increase at the same time. The economic growth, as measured by the GDP per capita, can be well explained by (is influenced by) the DESI index and is also positively influenced by the WHI.

Conclusions: The survey shows that digitalisation needs to be given enough attention because this factor is closely linked to social progress and not only that; the pandemic has clearly shown us that digital services are our future in many areas.

Keywords: digital transformation, social progress, Digital Economy and Society Index (DESI), World Happiness Index (WHI), correlation analysis, regression analysis

JEL Classification: I31, M15, M21

Introduction

The Covid-19 pandemic has contributed to the accelerated development of digital technologies and the creation of a common digital market in Europe. There have been some radical changes that have led to a massive growth in digital transformation. Efforts have been made to adopt new digital technologies such as mobile and visual connectivity, cloud computing, block chain, smartphones, the Internet of Things, robotics, artificial intelligence (AI), *etc.* (Soto-Acosta, 2020). Expanding the use of information technology is needed to ensure its proper functioning by adapting to new requirements in line with the EU strategic priorities, but also by linking them to best practice in the field (Bălăcescu *et al.*, 2021). The basic strategic framework for the economic development of the European Union was the Europe 2020 Strategy. One of the focuses of this framework is the area of digitisation, which aims, for example, at promoting faster deployment of high-speed internet, wider use of information and communication technologies (ICT), and also deals with cyber security or streamlining e-government services (European Commission, 2020). This is followed by the European Digital Decade: digital targets for 2030, aimed at empowering businesses and individuals in a future era that is digital, people-centric, sustainable, and prosperous (European Commission, 2021).

There are many benefits associated with the adoption of digital technologies that need to be tracked and measured. Over time, several indices have been developed to measure progress in so-called application areas such as internet access or broadband deployment. However, there is also a need to identify factors that have a major impact on the competitiveness of local economies in a global context. This requires looking at comprehensive indices such as the Digital Density Index (DDI), which measures how digital technologies affect economic growth, or the Digital Economy and Society Index (DESI), which monitors Europe's overall digital performance and measures the progress of individual EU countries in terms of their digital competitiveness (European Commission, 2022). Unlike other indices, which tend to be more general, the DESI shows specific values for each country in terms of the impact of ICT on its economy, *e.g.* how much the government is investing in the digitalisation of the economy (Ionescu-Feleaga *et al.,* 2022).

Social progress is a normative concept and can be defined as a change or progress in the main conditions of society and people's lives in a direction that is considered desirable on the basis of prevailing values and development goals. This means that current living and social conditions are considered to be an improvement over the past; in perspective, it means that future conditions are expected to be better than current ones. The issue is closely related to the measurement of well-being "beyond the GDP", and thus to alternative approaches to defining and measuring improvements in human well-being, social characteristics and quality of life in a way that is at least not limited to economic concepts (Noll, 2014). There are also several indices that address this topic comprehensively, such as the Good Country Index, which measures how much each country contributes through policies and behaviours contribute to the common good of the planet; the Human Development Index (HDI), which considers factors such as the standard of living of the population in addition to per capita income and education; and the World Happiness Index (WHI), which uses global surveys data such as life expectancy and education to determine how people in different countries around the world rate their own lives (Ionescu-Feleaga *et al.,* 2022).

The first part of the paper deals with a critical analysis of the literature, basically in the area of digital transformation, social progress, and indexes. The next part contains an empirical analysis of the relationship

between digitalisation and the level of happiness in European Union countries through DESI and WHI indicators.

1. Literature review

1.1 Digital transformation

Digital transformation is not only a single step for upgrading specific functions in an organisation, it is an integration of information technologies in process or activity that trigger fundamental changes in organisations. Digital transformation has become the crucial factor to enable organisations to be more competitive, innovative and prosperous (Feroz *et al.,* 2021). The digital transformation of businesses opens up new opportunities and accelerates the development of new and reliable technologies. The digital transformation depends on the level of the economy (measured by the GDP) and the availability of the country's resources. Digital transformation follows the process of digitisation and digitalisation and is driven by digital technologies where the effect of these enables 'unprecedented things' to be achieved (Brynjolfsson, McFee, 2014). The significant impact of digital transformation on business processes across all industries enables managers to focus on the connectivity of machines and devices to enable operations to be more efficient and quickly respond to market changes (Clerck, 2017).

Digitalisation contributes to economic growth and well-being for people, individuals and local and global communities, saving time and increasing productivity, facilitating trade, improving transparency and governance (Aitken, 2019). The adoption of digital technologies contributes to the development of social capital through access to large amounts of data related to education, health, medical services and entertainment, creating unlimited opportunities to improve scientific progress through rapid access to scientific publications, scientific data and information resources. On the other hand, it is not always an advantage that all this data is freely available (Ganju *et al.,* 2016). However, digitalisation is also associated with negative effects in terms of economic, social and psychological impacts on individuals and society in general. These effects relate, in particular, to cybersecurity, risk and insecurity in terms of data, financial resources, and personal life. There are also sustainability issues caused by the automation of service provision and data processing, but also the increase in unemployment and wage inequality caused by structural changes in the economy (Gaspareniene, Remeikiene, 2015; Frey, Osborne, 2017; Linkov *et al.,* 2018).

1.2 Digital Economy and Society Index (DESI)

The Digital Economy and Society Index is a composite index that summarises relevant indicators on Europe's digital performance and tracks the evolution of EU member states across five main dimensions. Through the DESI, we can monitor Europe's overall digital performance and track the progress of EU countries in digital competitiveness. In the framework of the "Digital Decade for Europe", the DESI index has been modified to be in line with the four key points set out in its proposal Decision on the policy programme. It will be the starting point for a structured, transparent and common monitoring system to measure progress towards each of the 2030 targets (Wenrong *et al.,* 2022; European Commission, 2021).

DESI country reports contain quantitative data obtained from the DESI index indicators in all its four dimensions (with 11 indicator groups overall), knowledge of country policies and best practices (European Commission, 2022; Laitsou *et al.,* 2020):

- Human capital – Internet user skills and advanced digital skills;
- Connectivity – Fixed broadband take-up, fixed broadband coverage, mobile broadband, and broadband prices;
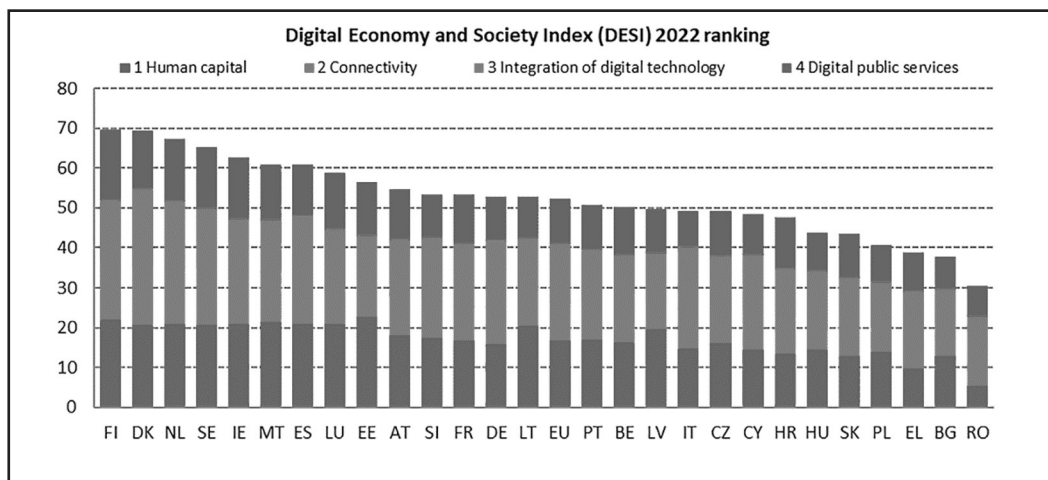
Figure 1. Digital Economy and Society Index 2022. Source: European Commission, 2022.

● Integration of digital technology – Business digitisation, and e-Commerce;

● Digital public services – e-Government.

The European Commission has published the results of the 2022 Digital Economy and Society Index (DESI), which tracks EU Member States' progress in digitalisation. The results reports are based mainly on 2021 data. The ranking of member states for 2021 is shown in Figure 1.

The DESI 2022 results show that while most member states are making progress in digital transformation, the uptake of key digital technologies by businesses, such as artificial intelligence and big data, remains low, even among leading EU countries. The lack of digital skills hampers future growth prospects, widens the digital divide, and increases the risks of digital exclusion as more and more services, including basic ones, move online. Increased efforts are needed to ensure the full deployment of ubiquitous connectivity infrastructure (in particular 5G), which is essential for highly innovative services and applications (European Commission, 2022; Ionescu-Feleaga *et al.,* 2022).

As we can see in Figure 1, the most advanced digital economies in the EU are Finland, Denmark, and the Netherlands. On the other hand, Romania, Bulgaria and Greece have the lowest scores on the index. The Czech Republic ranks on the 19th place among the 27 EU Member States, one place lower than in 2021. The country's strongest results is in the area of human capital. The Czech Republic is still struggling with a shortage of ICT professionals in the local labour market. This significant barrier is hampering the pace of digital transformation across the economy – from businesses and research institutions to public administration and schools (European Commission, 2022).

1.3 Social progress (World Happiness Index)

In recent years, happiness has become the strongest indicator of a country's social progress. This is the reason why the World Happiness Report for the UN High-Level Meeting on Well-being was first published in 2012. In 2017, another edition was published with more up-to-date information. The report uses six key variables to measure differences in happiness: "income, healthy life expectancy, having someone to rely on in times of trouble, generosity, freedom, and trust, the last of which is measured by the absence of corruption in business and government." All these six variables are then mixed to produce one combined score for each of 149

countries. Interestingly, the seven happiest countries in the world for 2021 were all Northern European countries. Finland scored the highest for the fourth consecutive year, with a total score of 7.842. The second place went to Denmark (7.620), followed by Switzerland (7.571), Iceland (7.554), the Netherlands (7.464), Norway (7.392) and Sweden (7.363). The least happy country in the world in 2021 was Afghanistan, which ranked on the 149th place with a value of 2.523, partly attributable to its low life expectancy and low gross domestic product per capita. Zimbabwe (3.145), Rwanda (3.415), Botswana (3.467), and Lesotho (3.512) belong among the worst five. A complete table with the rankings of all 149 countries can be found on the World Population Review website (World Population Review, 2022). The worst-performing EU countries on the WHI index were: Romania (5.266), Greece (5.723), Bulgaria (5.882), Poland (5.929), and Hungary (5.992), as we can see in (Helliwell *et al.,* 2022; Ionescu-Feleaga *et al.,* 2022).

2. Research methodology

According to the aim of the paper, the present research performed an analysis of the relationship between digitalisation and the level of happiness in European Union countries through the DESI and WHI indexes. All data presented and analysed in this article are from 2021.

The DESI was developed according to the guidelines and recommendations in the OECD Handbook on the construction of composite indicators: methodology and user guide. The data included in the index were mostly collected from the relevant authorities of the EU Member States by the European Commission (Directorate-General for Communications Networks, Content, and Technology, as well as Eurostat) and from ad hoc studies launched by the Commission. The indicators are structured in four dimensions.

There are overall weights attributed to the main dimensions of the DESI, reflecting the priorities of the EU digital policy. The indicators for each area are as follows:

- Human capital (25%): At least basic digital skills; ICT specialists; Female ICT specialists.
- Connectivity (25%): Fixed Very High-Capacity Network (VHCN) coverage; 5G coverage.
- Integration of digital technology (25%): AI; Cloud; Big data; Cloud; SMEs with a basic level of digital intensity.
- Digital public services (25%): Digital public services for citizens; Digital public services for businesses.

The WHI indicates the level of happiness and satisfaction of the country's inhabitants. It is published annually by the Sustainable Development Solutions Network and is based on comprehensive data from Gallup World surveys in 149 countries. The surveys monitoring performance in six categories, *i.e.* the GDPC; Healthy life expectancy; Generosity; Social support; Freedom and corruption, are compared to an imaginary country, called Dystopia (Helliwell *et al.,* 2022).

Subsequently, the correlation is used to describe the linear relationship between two continuous variables. The correlation coefficient is measured on a scale that varies from +1 to 0 to –1. The complete correlation between two variables is expressed by either +1 or –1. Very weak correlation labels the strength of association for absolute values of r 0–0.19. Regarded as a weak correlation is the strength of the correlation for absolute values of r 0.2–0.39, 0.40–0.59 as moderate, 0.6–0.79 as a strong, and 0.8–1 as a very strong correlation. When one variable increases as the other increases, the correlation is positive; when one decreases as the other increases, it is negative. The complete absence of correlation is represented by 0. In terms of research, a correlational study is generally used to study quantitative data and determine trends between the DESI index

and WHI index. The correlational study helps to isolate the variables and identify the interaction between them. If we find through the correlation coefficient that there is a relationship between two variables, we are able to express a certain prediction (Hendl, 2012).

Regression analysis was also used. Using the regression analysis, we examine the dependence of two or more numerical variables and estimate the values of the dependent variable y corresponding to a given value of one or more independent variables. The aim of the regression analysis is to determine the form of this dependence by means of an appropriate function through a trend, shape or progression. Thus, the regression function describes the dependence of the conditional mean values of the random variable Y on the values of the random variable X. In other words, unlike correlation, regression has the capacity to tell us how much influence the independent variable X has on the dependent variable Y and what specific value the dependent variable Y will have if we know what value the variable X has. We are able to predict the values of the dependent variable from the values of the independent variable. For the purpose of the study, the SPSS Statistics statistical software is used (Hendl, 2012).

3. Results

First, the data were subjected to basic statistical analysis. The GDP per capita (GDPC) was also added to the core indicators (the DESI and WHI). The results can be seen in Table 1.

According to the research results, the highest value of the DESI and WHI indicator was obtained for Finland. The DESI average value is 52.53 and the WHI average value is 6.63. Luxembourg had the highest reported GDP per capita (11.647) compared to the average, which is 10.63. The lowest results were achieved in Romania (DESI) and Bulgaria (WHI and GDPC). The same results were achieved in these countries in the previous years 2019 and 2020, as shown in the authors' research (Ionescu-Feleaga *et al.,* 2022).

Subsequently, the relationship between the variables was tested using Pearson's correlation coefficient. We use this parameter to see if there is a relationship between the variables and how strong the relationship is. The following correlations were examined: a very strong positive correlation was found between the DESI and WHI ($r = 0.8055$) and a strong positive correlation between the DESI and GDPC ($r = 0.6836$) and WHI and GDPC ($r = 0.7680$).

Then, the regression analysis was used to examine how the value of the dependent variable changes following a change in one of the independent variables (while the other independent variables remain constant). Linear regression is a method in which the set of points in a graph is interleaved with a straight line, since we assume that the dependence of y on x can be graphed as a straight line.

The results of the regression statistics are presented in Table 2. The table again shows the results for the three selected pairs of variables, which were tested through Pearson's correlation coefficient.

The Multiple R value indicates us the value of the correlation coefficient. The reliability R-value shows the value of the determination index (we can check it with the value

Table 1. Descriptive statistics of used variables in 2021.

Variable	Mean	Min.	Min. (country)	Max.	Max. (country)
DESI	52.53	30.6	Romania	69.6	Finland
WHI	6.63	5.266	Bulgaria	7.842	Finland
GDPC	10.63	10.016	Bulgaria	11.647	Luxembourg

Source: Own processing based on European Commission, 2022; Helliwell et al., 2022.

Table 2. Regression analysis between variables in 2021.

Variable	DESI(x)_WHI(y)	DESI(x)_GDPC(y)	WHI(x)_GDPC(y)
Multiple R	0.80552	0.68363	0.76801
Reliability R-value	0.64886	0.46735	0.58984
Set reliability R-value	0.63482	0.44604	0.57343
Coefficient (x)	0.053	0.024	0.409
Coefficient (limits)	3.816	9.354	7.911
Equation	y = 0.053x + 3.816	y = 0.024x + 9.354	y = 0.409x + 7.911

Source: Own processing based on European Commission, 2022; Helliwell et al., 2022.

in the graphs). It is the square of the squared correlation coefficient and indicates how accurate the prediction of values according to our regression equation will be. The value tells us that the model captures the data from those percentages. In the case of the DESI and WHI, the model captures 64.9% of the data, in the case of the DESI and GDPC, 46.7%, and in the case of the WHI and GDPC, the model reflects 58.9% of the data.

The constant of the calculated equation tells us how high the value of the dependent variable will be when the value of the independent variable is zero. Therefore in our case, if the DESI were 0, the WHI would be 3.816 and the GDPC would be 9.354 and if the WHI were 0, the GDPC would be 7.911.

A graphical representation of these relationships can be seen in the Figures 2, 3 and 4 including the reliability R-value.

Figure 2 shows us that there is a positive and significant relationship between the DESI index and the World Happiness Index and this information is also confirmed by the previous calculations. For this reason, we can confirm that digital technologies can have a major impact on social progress.

With increasing pressure to expand digitalisation and the digital economy, productivity is expected to grow and so is the GDP. Again, a relatively strong, positive relationship was found between the level of digitalisation and the GDPC. The strength of the relationship in this case was the lowest of the three values compared, yet still strong. The more the level of the digital economy and society grows, the more the GDPC will grow.

The last comparison was the dependence of the GDP on social welfare. Again, a strong positive dependence was found. Again,
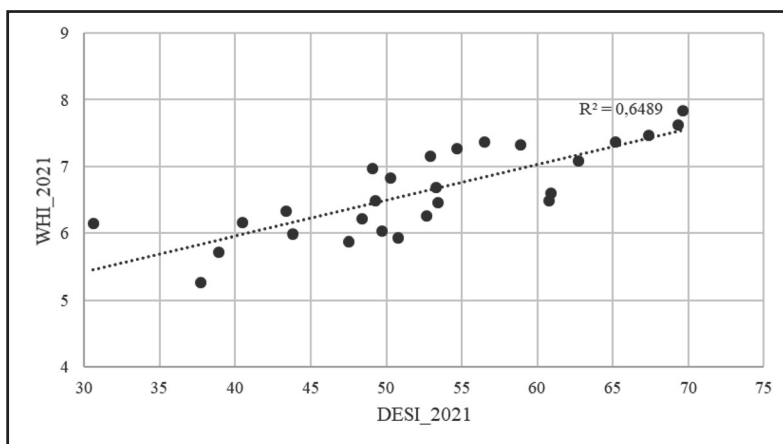

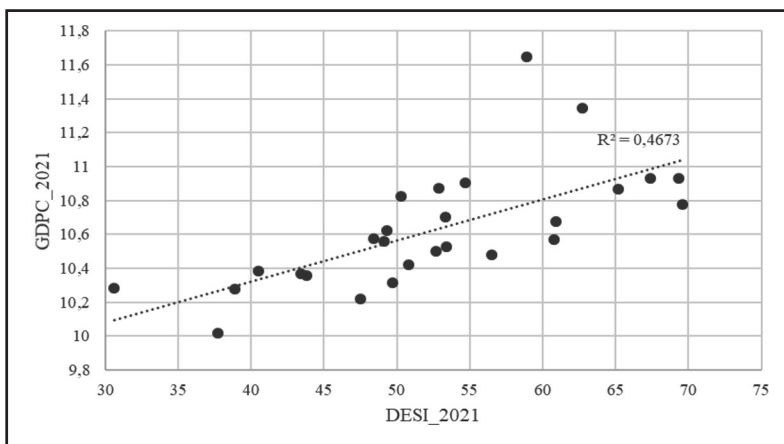*Figure 2. Regression analysis between the DESI and WHI in 2021. Source: Own processing.*

Figure 3. Regression analysis between the DESI and GDPC in 2021. Source: Own processing.
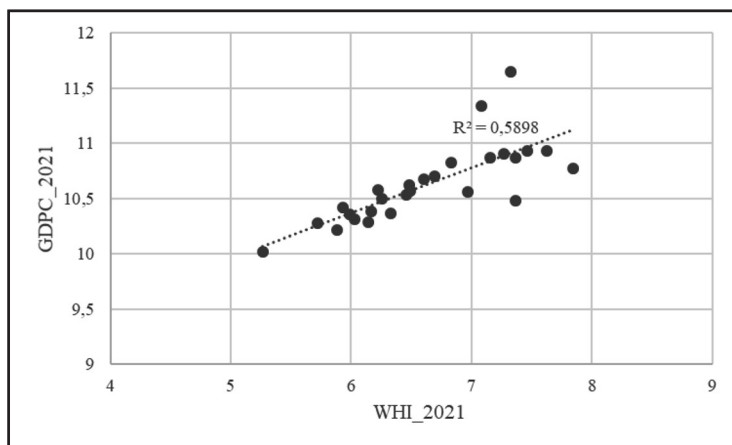

Figure 4. Regression analysis between the WHI and GDPC in 2021. Source: Own processing.

we can say that the more the WHI increases (*i.e.* the rankings of national happiness, based on respondent ratings of their own lives), the more the GDP grows.

4. Discussions

Digital technologies are now part of our everyday lives, which means that they are inevitably closely linked to happiness and social well-being (Surowiecki, 2005). Digital technologies in the work process contribute to reducing the effort employees have to put in to solve work problems, which has a positive effect on their physical and mental well-being (Watson, 2008). In addition, digital technologies can increase people's professional motivation and job satisfaction. This makes these people happier, more productive and efficient at work (Jose *et al.,* 2016). In this case, the results of our research are consistent with this claim, given that a positive relationship between countries' digital economy and social progress has been confirmed. The impact of digitalisation on the happiness of countries will only become more pronounced if people and policy makers learn to reconcile these two aspects. Digitalisation must be understood and acted

upon by all so that it has a noticeable impact on the happiness of nations (Ionescu-Feleaga *et al.,* 2022).

At the macro level, digital convergence positively impacts growth, mainly through labour productivity growth (Aly, 2022). It also saves time and increases productivity, facilitates trade and access to finance, and improves transparency and governance (Aitken, 2019). We can agree with this statement based on our results, given the result of the Pearson correlation coefficient and also based on the regression analysis. Previous research also provides us with the same information on how strong the impact of digital transformation is on economic growth. For instance, one study found that a 10% increase in a country's level of digitalisation increases the GDP per capita growth by 0.75% (Sabbagh *et al.,* 2013). Digital competitiveness is gaining growing attention as a source of competitive advantage and as a key element of national strategies to achieve economic goals such as growth and socio-economic development (Laitsou *et al.,* 2020). Economic growth as measured by the GDP per capita can be well explained by both the original and the optimised DESI. The results of the previous study have considerable relevance for measuring, supporting and deepening digital transformation. Thus, the DESI is a useful indicator for explaining changes in the GDP per capita (Olczyk, Kuc-Czarnecka, 2022).

5. Conclusion

We hear about digitalisation today and every day in different contexts. It is very often said that it has a positive effect in many respects. We have been investigating whether its effect is reflected in social progress.

The aim of this paper was to analyse the relationship between digitalisation and the happiness level in the European Union countries through the DESI and WHI indices. The correlation and regression analysis was used to examine the statistical relationship between variables. A strong positive relationship was found in all areas. The highest Pearson correlation coefficient values were found specifically for the DESI and WHI. Then, the regression analysis was used to examine how the value of the dependent variable changes following a change in one of the independent variables. It was found that there is a positive linear regression between the variables, which means that the growth of one variable leads to the growth of the other. As a complementary calculation, we focused on the macroeconomic level of EU countries through the GDP per capita. Economic growth, as measured by the GDP per capita, can be well explained by (is influenced by) the DESI index and is also positively influenced by the WHI.

However, this work has its limitations, as it focuses on only one year. Here, however, we assume that there have been changes in the DESI calculation and a comparison with previous years would not be very accurate. Nevertheless, the results can be considered as a basis for further research in this area in the context of further (future) comparisons.

Today, economies and companies are forced to adapt rapidly to the ever-evolving digital environment. Information and communication technologies (ICT) have become more than common and, more importantly, a key part of everyday use for individuals, businesses and national economies. It is therefore necessary to pay attention to this area and to monitor how it affects different areas at macro, micro and personal level.

References

Aitken, A. (2019). Measuring Welfare Beyond GDP. *National Institute Economic Review,* 249(1), pp. 3–16. DOI: 10.1177/002795011924900110.

Aly, H. (2022). Digital transformation, development and productivity in developing countries: Is artificial intelligence a curse or a blessing? *Review of Economics and Political Science*, 7(4), pp. 238–256. DOI: 10.1108/REPS-11-2019-0145.

Bălăcescu, A., Pătrașcu, A., Păunescu, L. M. (2021). Adaptability to Teleworking in European Countries. *Amfiteatru Economic*, 23(58), pp. 683–699. DOI:10.24818/EA/2021/58/683.

Brynjolfsson, E., Mcfee, A. (2014). *The second machine age: work, progress, and prosperity in a time of brilliant technologies*. New York: W. W. Norton & Company. 281 pp.

Clerck, J. (2017). *Digitization, digitalization and digital transformation: the differences. i-SCOOP.* Retrieved from: http://www.i-scoop.eu/digitization-digitalization-digital-transformation-disruption/.

European Commission (2022). *Digital Economy and Society Index. 2022*. 88 pp. Retrieved from: https://digital-agenda-data.eu/datasets/desi/visualizations.

European Commission (2021). *Europe's Digital Decade: digital targets for 2030*. Retrieved from: https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en.

European Commission (2020). *EUROPE 2020. A European strategy for smart, sustainable and inclusive growth*. 37 pp. Retrieved from: https://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf.

Feroz, A. K., Zo, H., Chiravuri, A. (2021). Digital transformation and environmental sustainability: A review and research agenda. *Sustainability,* 13(3), pp. 1530. DOI: 10.3390/su13031530.

Frey, C. B., Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerisation? *Technological Forecasting & Social Change*, 114, pp. 254–280. DOI: 10.1016/j.techfore.2016.08.019.

Ganju, K. K., Pavlou, P., Banker, R. D. (2016). Does information and communication technology lead to the well-being of nations? A country level empirical investigation. *MIS Quarterly,* 40(2), pp. 417–430. DOI: 10.25300/MISQ/2016/40.2.07.

Gaspareniene, L., Remeikiene, R. (2015). Digital Shadow Economy: A Critical Review of the Literature. *Mediterranean Journal of Social Sciences*, 6(6 S5), pp. 402. DOI: 10.5901/ajis.2015.v4n3s1p653.

Hendl, J. (2012). *Přehled statistických metod: analýza a metaanalýza dat*. [Overview of Statistical Methods: Data Analysis and Meta-analysis]. 4th ed. Prague: Portál, 734 pp.

Helliwell, J. F., Layard, R., Sachs, J. D., De Neve, J.-E., Aknin, L. B., Wang, S. (2022). *World Happiness Report 2022*. New York: Sustainable Development Solutions Network, 158 pp.

Ionescu-Feleaga, L., Ionescu, B.-S., Stoica, O. C. (2022). The Impact of Digitalization on Happiness: A European Perspective. *Mathematics*, 10, pp. 2766. DOI: 10.3390/math10152766.

Jose, S., Sookdeo, T., Says, I., Carreno, Y., Ferrero, R. (2016). *The Smart Digital Platform for Effective Well Control Management*. Aberdeen: SPE Intelligent Energy International Conference and Exhibition. Conference Paper.

Laitsou, E., Kargas, A., Varoutas, D. (2020). Digital competitiveness in the European Union Era: The Greek case. *Economies*, 8(4), pp. 85. DOI: 10.3390/economies8040085.

Linkov, I., Trump, B. D., Poinsatte-Jones, K., Florin, M. V. (2018). Governance strategies for a sustainable digital world. *Sustainability*, 10, pp. 440. DOI: 10.3390/su10020440.

Noll, H. H. (2014). Societal Progress. In: *Encyclopedia of Quality of Life and Well-Being Research*. Dordrecht: Springer, Michalos, A. C (eds). DOI: 10.1007/978-94-007-0753-5_2800.

Olczyk, M., Kuc-Czarnecka, M. (2022). Digital transformation and economic growth – desi improvement and implementation. *Technological and Economic Development of Economy*, 28, pp. 803–803. DOI: 10.3846/tede.2022.16766.

Sabbagh, K., Friedrich, R., El-Darwiche, B., Singh, M., Koster, A. (2013). Digitization for economic growth and job creation: Regional and industry perspectives. In *The global information technology report*, pp. 35–42.

Soto-Acosta, P. (2020). COVID-19 Pandemic: Shifting Digital Transformation to a High-Speed Gear. *Information Systems Management,* 37(4), pp. 260–266. DOI: 10.1080/10580530.2020.1814461.

Surowiecki, J. (2005). REVIEWS-Technology and Happiness-Why getting more gadgets won't necessarily increase our well-being. *Technology Review-Palm Coast*, 108(1), pp. 72–77.

Watson, J. (2008). *Media Communication: An Introduction to Theory and Process.* 3rd ed. New York: Palgrave Macmillan, 452 pp.

Wenrong, P., Tao, X., Zhuwang, W., Lisha, M. (2022). Digital economy: An innovation driver for total factor productivity. *Journal of Business Research*, 139, pp. 303–311. DOI: 10.1016/j.jbusres.2021.09.061.

Ing. Jana Hornungová, Ph. D.
Brno University of Technology
Faculty of Business and Management
Department of Economics
Kolejní 2906/4, Brno, 612 00
Czech Republic
Phone: +420 54114 2616
E-mail: Jana.Hornungova@vut.cz

Ing. Kateřina Petrová
Brno University of Technology
Faculty of Business and Management
Department of Management
Kolejní 2906/4, Brno, 612 00
Czech Republic
Phone: +420541142608
E-mail: xphornungova@vutbr.cz