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DYNAMICS OF CHANGES IN THE LEVEL OF PROPENSITY TO USE THE INTERNET IN EUROPEAN UNION COUNTRIES IN 2010-2019

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Abstract: The article analyses the level of propensity to use the Internet in 28 countries of the European Union in 2010 and 2019 and assesses its dynamics of changes in this period. For this purpose, information available in the databases of Eurostat and the World Bank regarding the ways in which the Internet was used by citizens and households. The study omitted issues related to the commercial use of the Internet potential by enterprises. For individual years, taxonomic synthetic measures were constructed based on a set of diagnostic features, using the TOPSIS method. These measures determine, respectively: the level of willingness to use the network by citizens and households of individual EU countries as well as the rate of changes in the analysed period. The research shows that the highest propensity to use the Internet was characteristic of citizens of Northern European countries and the lowest was in Southern Europe. The R environment and the Statistica package were used for the calculations.

Keywords: use of the Internet, EU countries, level of propensity.

1. Introduction

Global network, global village, and the web are just some descriptions of the Internet – a medium that changed the end of the 20th and the beginning of the 21st century. Initially, it was only a way of communication which evolved into a virtual world

full of miracles, but with just as many threats (Leiner et al., 1997). Unlike other mass media, it enables full interaction between the sender and the recipient, which leaves a growing mark on the 'offline' world (see Morrison, Pirolli, and Card, 2001; Castells, 2014, Talooki, Ataee, Gorji, and Aghaei, 2017; RMAA, 2019).

At the end of 2019 almost 4.6 billion people were connected to the 'global village', most of them in Asia (2.3 billion), while in Europe the number of users is estimated at around 728 million. It is estimated that on the Old Continent almost 9 out of 10 inhabitants have used the Internet (Internet World Stats, 2020).

Similarly to how technical progress changes the way we live, so does the Internet for its users. This applies to even such a prosaic activity as seeking information. The results of the research presented by Liu (2020) indicate that in 2019 most users look for information to expand their knowledge ("Understand"). On the other hand, in 1997, users searched for information for comparison purposes or to make a choice ("Compare/Choose"). Interestingly, the most frequently sought information have not changed much – 30% of them are questions about products and their purchase. User profiles have also been changing dynamically (Krairit, 2019).

Due to technical progress, the computer ceased to be the only means of access to the 'global village'. For example, in the United Kingdom in 2008, only 15% of users used mobile devices to browse the Internet, while in 2018 it was 73% (Golds, 2018). In 2019, on average 48% of the time spent on the web worldwide ocurred on mobile devices (Kemp, 2019).

The average time spent on the Internet has also increased – in the United Kingdom in 2013, 40% of users spent 5 to 19 hours online, while in 2018 the same number used the Internet for over 20 hours (Golds, 2018). Globally, in 2019 people spent an average of 6 hours and 42 minutes on the Internet (Datareportal, 2019).

Due to the enormous potential that enables both the development of the economy and the functioning of the state, each country is trying to stimulate the development of the digital society to make the most of it (Stachowiak, 2008; OECD, 2016). The importance of this issue is demonstrated by the fact that the majority of institutions dealing with public statistics collect and analyse a large amount of statistical data, enabling the specification of the use of the Internet by society (see Główny Urząd Statystyczny [GUS], 2019; Eurostat, 2020).

Due to such a large variety of users, nature, manner, time of use, as well as technical, economic and legal conditions, it is difficult to find the level of propensity to use the Internet by households or citizens of individual countries. Therefore, the main purpose of this paper is an attempt to assess the rate of change in the level of propensity to use the Internet by citizens and households of 28 EU countries in the period 2010-2019. The study omitted issues related to the commercial use of the Internet potential by enterprises. The TOPSIS method was used as a research tool, which on the one hand allows the assessment of the potential of each country, and on the other shows changes in its level over time.

2. Statistical data and research methods

The study covered 28 European Union countries. The data used in the analysis concerned the years 2010 and 2019, and come from the databases of Eurostat (Eurostat, 2020) and the World Bank (World Bank, 2020). Most of them derive from the ICT (Information and Communication Technologies) questionnaire, which covered over 150,000 households and 200,000 persons, carried out by national statistical offices. Due to the fact that the scope of the ICT survey is modified every year, 28 variables were finally qualified to the set of potential diagnostic features related to the use of the Internet in households. They were grouped into five categories and presented in Table 1.

Table 1. Set of potential diagnostic features for testing the propensity to use the Internet in EU countries in 2010 and 2019

Area	Symbol	Diagnostic feature
1	2	3
Infrastructure	X_1	Households with broadband access [% of households]
	X_2	Secure Internet servers [per 1 mln people]
Frequency of use	X_3	Last Internet use: in the last 3 months [% of individuals]
	X_4	Last Internet use: in the last 12 months [% of individuals]
	X_5	Individuals who have ever used the Internet [% of individuals]
	X_6	Internet use: never [% of individuals]
Internet use	X_7	Individuals using the Internet for sending/receiving e-mails [% of individuals]
	X_8	Individuals using the Internet for ordering goods or services [% of individuals]
	X_9	Individuals using the Internet for ordering goods or services from other EU countries [% of individuals]
	X_{10}	Individuals having ordered/bought goods or services for private use over the Internet in the last three months [% of individuals]
	X_{11}	Individuals using the Internet for selling goods or services [% of individuals]
	X_{12}	Individuals using the Internet for Internet banking [% of individuals]
	X_{13}	Individuals using the Internet for seeking health-related information [% of individuals]
	X_{14}	Individuals using the Internet for ordering goods or services [% of individuals]
	X_{15}	Individuals using the Internet for doing an online course [% of individuals]
	X_{16}	Internet use: uploading self-created content to any website to be shared [% of individuals]
	X_{17}	Internet use: finding information about goods and services [% of individuals]
E-government	X_{18}	Internet use: interaction with public authorities (last 12 months) [% of individuals]
	X_{19}	Internet use: obtaining information from public authorities web sites (last 12 months) [% of individuals]
	X_{20}	Internet use: downloading official forms (last 12 months) [% of individuals]
	X_{21}	Internet use: submitting completed forms (last 12 months) [% of individuals]

1	2	3
Barriers and security concerns	X_{22}	Households without access to Internet at home, because the access costs are too high (telephone, etc.) [% of households without Internet access at home]
	X_{23}	Households without access to Internet at home, because of lack of skills [% of households without Internet access at home]
	X_{24}	Security concerns limited or prevented individuals from ordering or buying goods or services [% of individuals]
	X_{25}	Security concerns limited or prevented individuals from carrying out Internet banking [% of individuals]
	X_{26}	Security concerns limited or prevented individuals from providing personal information to social or professional networking services [% of individuals]
	X_{27}	Security concerns limited or prevented individuals from communicating with public services or administrations [% of individuals]
	X_{28}	Security concerns limited or prevented individuals from downloading software or apps, music, video files, games or other data files [% of individuals]

Source: own study, based on Eurostat.

In the first stage of research, the initial set of diagnostic features was reduced in such a way that the obtained features were characterized by a high discriminatory value (Roszkowska, Filipowicz-Chomko, and Wachowicz, 2017). For this purpose, a two-step procedure was used, which guarantees high variability of features and their low correlation (Tarka 2010; Grabiński, 1992). This procedure was used for data for 2010, which was adopted as the base year of the analysis. Due to the desire to maintain comparability, an identical set of features was adopted in 2019.

At the beginning, the features characterized by low variability were eliminated, which was assessed using the classic coefficient of variation (Anderson, Sweeney, and Williams, 2011, p. 99). Its minimum level was set at 10%. In the second step, features that were highly correlated with others were eliminated. For this purpose the parametric Hellwig selection method was used ($r^* = 0.5$) (Nowak, 1990, pp. 28-33).

As a result of the used procedure, a set of five features was identified, which were adopted for further analysis. Their symbols, names and impact on the studied phenomenon are presented in Table 2.

In the second stage of research, a taxonomic synthetic measure of EU countries was built using the TOPSIS (Technique for Order Preference by Similarity to an Ideal Solution) method (see Manoj, 2013; Parida and Sahoo, 2013). This method determines the pattern (positive ideal object) and anti-pattern (negative ideal object) for each diagnostic feature. The preferred object should have the smallest distance from the positive ideal object and the largest distance from the negative ideal object. The procedure takes eighth steps.

Table 2. The final set of diagnostic features used to determine the synthetic measure for 2010 and 2019

Symbol	Diagnostic feature	Properties
X_{15}	Individuals using the Internet for doing an online course [% of individuals]	stimulant*
X_{18}	Internet use: interaction with public authorities (last 12 months) [% of individuals]	stimulant*
X_{22}	Households without access to the Internet at home, because the access costs are too high (telephone, etc.) [% of households without Internet access at home]	destimulant**
X_{23}	Households without access to Internet at home, because of lack of skills [% of households without Internet access at home]	destimulant**
X_{27}	Security concerns limited or prevented individuals from communicating with public services or administrations	destimulant**

* Stimulant – an increase of a feature affects the studied phenomenon positively; ** destimulant – an increase of a feature affects the studied phenomenon negatively.

Source: own study.

In the first step of the TOPSIS procedure, weights were selected that met the condition:

$$\sum_{k=1}^{5} w_k = 1 \tag{1}$$

where: w_k – weight assigned to the k-th diagnostic feature.

To exclude the possibility of the influence of a different number of final diagnostic features in individual areas on the value of the calculated synthetic measure, it was decided to assign individual weights for each of the features. Their values are presented in the table below by category.

Table 3. Individual weights of diagnostic characteristics by areas

	Internet use	E-government	Barriers and security concerns
Features	X_{15}	X_{18}	X_{22}, X_{23}, X_{27}
Unit weights	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{9}$

Source: own study

Based on the selected weights, the weighted matrices were determined:

$$V_t = [v_{ik,t}] \tag{2}$$

with elements equal to:

$$v_{ik,t} = w_k x_{ik,t} \tag{3}$$

where: $v_{ik,t}$ – weighted value of *k*-th diagnostic characteristic for *i*-th district in year *t*, $x_{ik,t}$ – value of *k*-th characteristic for *i*-th district in year *t* (*t* = 2010, 2019).

In the second step, to ensure data comparability the values of diagnostic features were standardized based on the formula:

$$z_{ik,t} = \frac{v_{ik,t} - \bar{v}_{k,t}}{S(v_{k,t})} \tag{4}$$

where: $\bar{v}_{k,t}$ – arithmetic mean of *k*-th characteristic in year *t*, $S(v_{k,t})$ – standard deviation of *k*-th characteristic in year *t*.

In the third step the coordinates of the pattern (Positive Ideal Solution) and anti-pattern (Negative Ideal Solution) were determined for each diagnostic feature based on the formulas:

$$z_{k,t}^{+} = \begin{cases} \max\limits_{i,t} z_{ik,t} & \text{for stimulants} \\ \min\limits_{i,t} z_{ik,t} & \text{for destimulants} \end{cases} \tag{5}$$

$$z_{k,t}^{-} = \begin{cases} \min\limits_{i,t} z_{ik,t} & \text{for stimulants} \\ \max\limits_{i,t} z_{ik,t} & \text{for destimulants} \end{cases} \tag{6}$$

where: z_k^+ – *k*-th coordinate of Positive Ideal Solution, z_k^- – *k*-th coordinate of Negative Ideal Solution.

In the fourth step, the coordinates of the standard and anti-pattern common for both periods were determined (Walesiak and Obrębalski, 2017):

$$z_k^{*+} = \begin{cases} \max\limits_{k,t} z_{k,t}^{+} & \text{for stimulants} \\ \min\limits_{k,t} z_{k,t}^{+} & \text{for destimulants} \end{cases} \tag{7}$$

$$z_k^{*-} = \begin{cases} \min\limits_{k,t} z_{k,t}^{-} & \text{for stimulants} \\ \max\limits_{k,t} z_{k,t}^{-} & \text{for destimulants} \end{cases} \tag{8}$$

where: z_k^+ – *k*-th coordinate of Positive Ideal Solution, z_k^- – *k*-th coordinate of Negative Ideal Solution.

This means that the basis for the construction of the synthetic measure will be common for both analysed periods.

In the fifth step, Euclidean distances from the pattern and anti-pattern are determined for each country each year:

$$d_i^+ = \sqrt{\sum_{k=1}^{5} \left(z_{ik,t} - z_k^{*+}\right)^2} \tag{9}$$

$$d_i^- = \sqrt{\sum_{k=1}^{5} \left(z_{ik,t} - z_k^{*-}\right)^2} \tag{10}$$

where: $d_{i,t}^+$ – Euclidean distance between *i*-th country and Positive Ideal Solution in year *t*, $d_{i,t}^-$ – Euclidean distance between *i*-th country and Negative Ideal Solution in year *t*.

In the sixth step, the value of the taxonomic measure of development ($Z_{i,t}$) was calculated for each EU country in each year using the formula:

$$Z_{i,t} = \frac{d_{i,t}^-}{d_{i,t}^- - d_{i,t}^+} \tag{11}$$

In the seventh stage of the research, the taxonomic indicator $Z_{i,2019/2010}$ was determined (Hydzik, 2012; Oesterreich, Perzyńska, and Barej-Kaczmarek, 2019):

$$Z_{i,2019/2010} = \frac{Z_{i,2019} - Z_{i,2010}}{Z_{i,2010}} \tag{12}$$

Similar to the $Z_{i,t}$ measure, country rankings were created by sorting them by a non-decreasing value.

In the last, eighth stage, EU countries were classified into four typological groups differing in the level of development in 2010 ($Z_{i,2010}$), in 2019 ($Z_{i,2019}$) and the rate of change ($Z_{i,2019/2010}$) (Bąk and Szczecińska, 2016, p. 29).

3. Results

A synthetic measure built using the procedure presented in the previous section should be treated as an aggregate measure enabling the assessment of the level of propensity of Internet use by citizens of a given country. Table 4 presents information on the values of synthetic measures, the ranks assigned to them, as well as the absolute and relative increases.

Table 4. Values of synthetic measures, their changes, ranks and typological groups by EU countries

Countries	$Z_{i,2010}$	ranks	groups	$Z_{i,2019}$	ranks	groups	absolute change	ranks change	$Z_{i,2019/2010}$	Ranks	groups
Austria	0.433	14	3	0.543	11	2	0.110	–3	0.254	7	2
Belgium	0.434	13	3	0.503	12	2	0.070	–1	0.160	12	2
Bulgaria	0.287	24	4	0.254	27	4	–0.032	3	–0.113	27	4
Croatia	0.287	23	4	0.291	26	4	0.004	3	0.014	21	3
Cyprus	0.274	28	4	0.375	22	3	0.101	–6	0.368	5	1
Czechia	0.305	21	3	0.453	17	3	0.148	–4	0.485	3	1
Denmark	0.609	3	1	0.732	4	1	0.123	1	0.201	10	2
Estonia	0.504	9	2	0.755	3	1	0.250	–6	0.496	2	1
Finland	0.829	1	1	0.799	2	1	–0.030	1	–0.037	25	4
France	0.512	8	2	0.552	10	2	0.040	2	0.079	17	3
Germany	0.419	16	3	0.463	16	3	0.044	0	0.105	16	3
Greece	0.282	25	4	0.424	19	3	0.142	–6	0.504	1	1
Hungary	0.350	19	3	0.391	21	3	0.041	2	0.118	14	3
Ireland	0.454	11	2	0.616	7	2	0.161	–4	0.355	6	1
Italy	0.293	22	4	0.304	24	4	0.011	2	0.037	20	3
Latvia	0.414	17	3	0.490	14	3	0.076	–3	0.183	11	2
Lithuania	0.493	10	2	0.465	15	3	–0.028	5	–0.057	26	4
Luxembourg	0.576	4	1	0.561	9	2	–0.014	5	–0.025	24	3
Malta	0.446	12	2	0.493	13	3	0.047	1	0.106	15	3
Netherlands	0.570	6	1	0.689	6	1	0.120	0	0.210	9	2
Poland	0.323	20	3	0.348	23	3	0.025	3	0.077	18	3
Portugal	0.280	26	4	0.302	25	4	0.022	–1	0.077	19	3
Romania	0.278	27	4	0.232	28	4	–0.046	1	–0.164	28	4
Slovakia	0.401	18	3	0.404	20	3	0.003	2	0.006	23	3
Slovenia	0.419	15	3	0.424	18	3	0.005	3	0.011	22	3
Spain	0.534	7	2	0.598	8	2	0.063	1	0.118	13	3
Sweden	0.619	2	1	0.866	1	1	0.247	–1	0.399	4	1
United Kingdom	0.572	5	1	0.710	5	1	0.139	0	0.243	8	2

Source: own study.

The average value of the synthetic measure calculated for the 28 EU countries in 2010 was 0.436, with the coefficient of variation equal to 30.72%. This means a high diversity of the analysed group of countries in terms of the level of propensity of

Internet use by their citizens. At the same time, the value of the skewness coefficient (0.828) clearly indicates the advantage of countries with a synthetic value below the average, this was noted for 16 countries.

Finland was the country with the highest level of synthetic measure (0.829), i.e. its citizens were the leaders in terms of the propensity of use of the Internet in everyday life in the EU in 2010. Next came the citizens of Sweden (0.619) and Denmark (0.609). The least willing to use the Internet as a medium for carrying out everyday matters were the citizens of Cyprus (0.274). Slightly higher values of measures were recorded for Portugal (0.280) and Romania (0.278). Figure 1 presents the spatial distribution of the value of the analysed measure in 2010 by typological groups and countries.

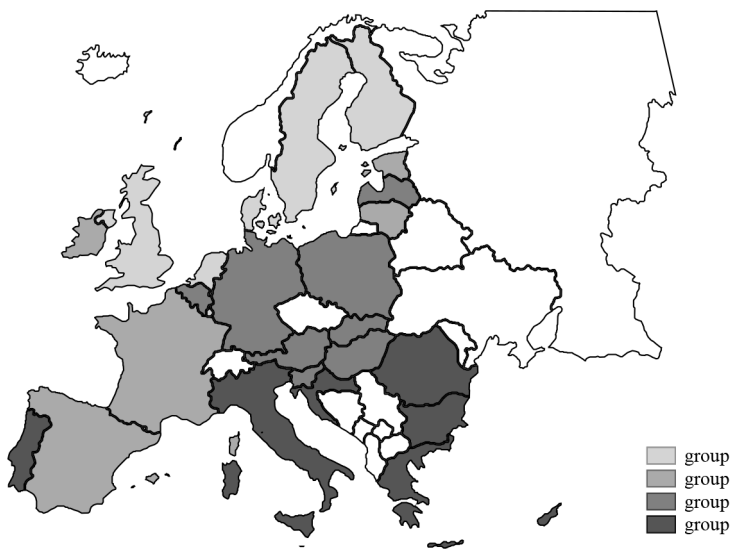

Fig. 1. Spatial distribution of the synthetic measure value for 2010 by EU countries and typological groups

Source: own study.

Figure 1 shows a clear 'gradient' stretching from Northern to Southern Europe. This indicates that North Europeans were more likely to use the Internet in 2010 than citizens of other Member States.

The average value of the taxonomic measure in 2019 was 0.501, which means an increase by approximately 15.1% compared to 2010. At the same time, its diversity slightly (2.64%) increased. This means maintaining a high level of diversity of the analysed group. The skewness ratio (0.431) still indicates the advantage of countries with a synthetic value below the average, and this situation, just as in 2010, affected 16 countries.

The highest level of synthetic measure in 2019 was recorded for Sweden (0.886). In second and third place were Finland (0.799) and Estonia (0.755), whereas the citizens of Romania (0.232), Bulgaria (0.287) and Croatia (0.287) turned out to be the least willing to use the Internet. Figure 2 presents the spatial distribution of the value of the analysed measure of 2019 by typological groups.

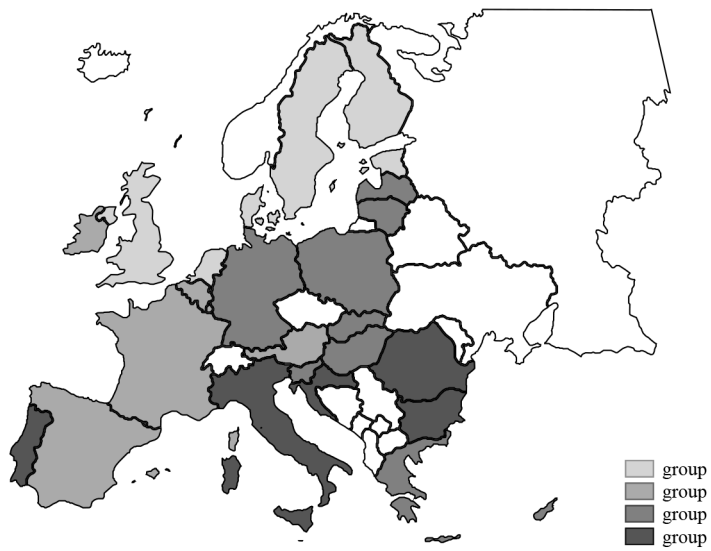

Fig. 2. Spatial distribution of the synthetic measure value for 2019 by EU countries and typological groups

Source: own study.

Figure 2, similarly to Figure 1, shows the 'gradient' stretching from north to south Europe. It seems that the inhabitants of Northern Europe were also more likely to use the Internet in 2019 than the citizens of other EU Member States.

The highest relative increase in synthetic measure in 2010-2017 was recorded for Greece (50.4%) – a rise from 25th to 19th place. Only slightly lower increases were recorded for Estonia (49.6%) and the Czech Republic (48.4%). In their case, this resulted in a rise in positions from 9th to 3rd and 21st to 17th, respectively. In absolute terms, the largest increases were recorded for Estonia (0.250) and Sweden (0.247).

For five countries: Romania, Bulgaria, Lithuania, Finland and Luxembourg, the value of the synthetic measure decreased by 16.4%, 11.3%, 5.7%, 3.7% and 2.5%, respectively.

Figure 4 presents changes in the value of diagnostic features between 2010 and 2019 of the countries with the highest relative increase (Greece) and decrease in synthetic measure (Romania).

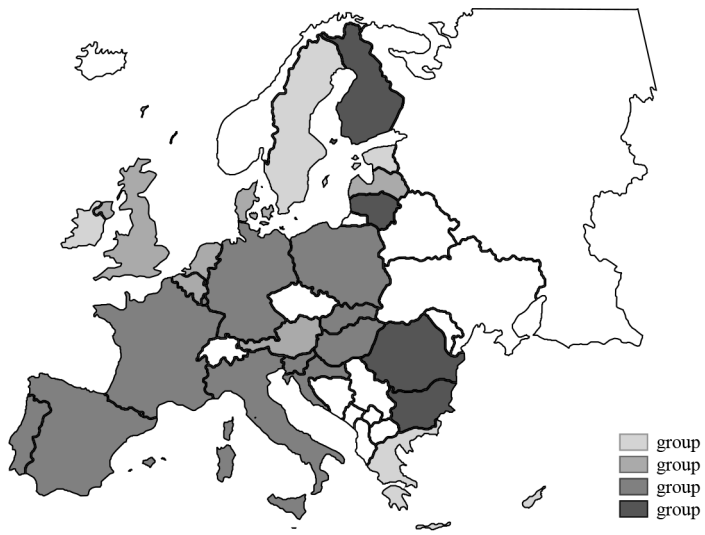

Fig. 3. Spatial distribution of relative changes in the value of synthetic measures for 2010-2019 by EU countries and typological groups

Source: own study

Fig. 4. Changes in the value of final set of diagnostic features in 2010-2019 for Greece and Romania

Source: own study.

Figure 4 shows that between 2010 and 2019, for Greece there was a two-fold (200%) increase in the share of respondents who declared participation in online courses (X_{15}), as well as more than a two-fold (225%) increase in the share of respondents using the Internet to interact with public authorities in last the 12 months (X_{18}).

For the following two diagnostic features: X_{22} (% of households without access to the Internet due to high costs) and X_{23} (% of households without access to the

Internet due to lack of skills), a sharp increase in the levels of their share was noted. It is important to emphasize that the percentage of respondents who indicated the lack of skills as the reason for the lack of Internet access in Greece increased by 100%.

The answers given by Romanian respondents demonstrate that the percentage of people doing online courses (X_{15}) decreased in the analysed period by 25%. At the same time, the share of people using the Internet to interact with public authorities in the last 12 months (X_{18}) increased by 50%. Unlike in Greece, in Romania the share of households without Internet access due to high costs (X_{22}) decreased by half. As for the feature X_{23}, the share of households whose members have insufficient skills to use the Internet increased by 50%.

For the last diagnostic feature: X_{27} (security concerns limited or prevented individuals from communicating with public services or administrations), for both countries the share of respondents did not change.

In the last step of the analysis, an attempt was made to assess the causes of changes in the level of propensity of Internet use in EU countries. To study this, the relationship between the ratings of synthetic measures $Z_{i,2010}$, $Z_{i,2019}$ and $Z_{i,2019/2010}$, as well as the value of GDP per capita, were examined.

Table 5. Pearson's linear correlation coefficients between the values of the synthetic measure: $Z_{i,2010}$, $Z_{i,2019}$, $Z_{i,2019/2010}$.

Variables	$Z_{i,2010}$	$Z_{i,2019}$	$Z_{i,2019/2010}$
$Z_{i,2010}$	1.000	0.889	0.007
$Z_{i,2019}$	0.889	1.000	0.438
$Z_{i,2019/2010}$	0.007	0.438	1.000

Source: own study.

Table 5 shows that the level of the synthetic measure in 2019 depended directly on the value in 2010. At the same time, the change in its value between 2010 and 2019 did not depend on the value in 2010. This clearly indicates a different dynamics of changes in the level of propensity of Internet use by residents of EU countries. This could have been influenced both by actions taken by governments and the public administration of individual countries (e-government), but also by issues related to security.

Table 6 presents the Pearson's linear correlation coefficients between the levels of synthetic measures $Z_{i,2010}$, $Z_{i,2019}$, $Z_{i,2019/2010}$, and GDP per capita.

The estimates of correlation coefficients for 2010 and 2019 indicate that there is a moderate relationship between the levels of synthetic measure and the value of gross domestic product per capita. This means that the level of propensity of use of the Internet depended only to a moderate degree on the wealth of society.

Table 6. Pearson's linear correlation coefficients between the values of GPD per capita and the values of the synthetic measure in particular periods and increments.

Variables	GDP 2010	$Z_{i,2010}$	GDP 2019	$Z_{i,2019}$	GDP 2010->2019	$Z_{i,2019/2010}$
GDP 2010	1.000	0.575	–	–	–	–
$Z_{i,2010}$	0.575	1.000	–	–	–	–
GDP 2019	–	–	1.000	0.548	–	–
$Z_{i,2019}$	–	–	0.548	1.000	–	–
GDP 2010->2019	–	–	–	–	1.000	–0.192
$Z_{i,2019/2010}$	–	–	–	–	–0.192	1.000

Source: own study.

At the same time, the value of the correlation coefficient indicates the existence of a low relationship between the increase in per capita GDP and the rate of changes in the level of propensity of use of the Internet by EU citizens. Interestingly, the sign of the coefficient suggests that GDP per capita growth slowed down the process of the wider application of the global network in the analysed group of countries.

4. Conclusion

The following conclusions can be drawn from the analysis presented in the work:

1. The highest levels of Internet use in the EU, both in 2010 and 2019, were recorded in Northern European countries – Finland and Sweden, while the lowest were in the south-east and south – Romania, Bulgaria and Croatia.

2. The assessments of descriptive statistics of the distribution of synthetic measures indicate the high level of diversity of EU countries in terms of the level of propensity of the Internet use in 2010 and 2019. Right-sided asymmetry indicates that most countries obtained values below the average.

3. The analysis of changes in the level of propensity of the Internet use in 2010-2019 shows that the highest dynamics in the EU was recorded in Northern European countries. The only exception was Finland, for which the negative value of the synthetic measure $Z_{i,2019/2010}$ was obtained.

4. For the analysed group of countries, the value of the synthetic measure in 2019 depended directly on the level of measure in 2010. However, no clear relationship between the level and dynamics of change was found.

5. A moderate positive relationship was found between the value of GDP per capita in EU countries and the level of synthetic measure in both analysed years.

6. The analysis of the relationship between the increase in the value of GDP per capita and the increase in the synthetic measure in the analysed period shows that for EU countries it was weak. In turn, the negative sign indicates that the increase in the level of GDP per capita, the decrease the increment of the level of propensity of Internet use.

The above conclusions clearly show that EU countries are diverse in terms of the level of propensity of use of the Internet by their citizens. Moreover, the analysis carried out clearly indicate a slight increase in this diversity in the analysed period. At the same time, the source of this diversification, only to a moderate level, should be seen as differences in the economic level. This may mean that the analysed phenomenon could be affected by institutional and legal factors. This can be seen as an advantage of Northern European countries, characterised by higher socio-economic development than other EU countries (see UNPD, 2019).

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DYNAMIKA ZMIAN POZIOMU SKŁONNOŚCI DO WYKORZYSTANIA INTERNETU W PAŃSTWACH UNII EUROPEJSKIEJ W LATACH 2010-2019

Streszczenie: W artykule dokonano analizy poziomu skłonności do wykorzystania Internetu w 28 państwach Unii Europejskiej w latach 2010 oraz 2019, a także dokonano oceny jej dynamiki zmian w tym okresie. W tym celu posłużono się informacjami dostępnymi w bazie danych Eurostatu oraz Banku Światowego dotyczącymi sposobów korzystania z sieci przez obywateli oraz gospodarstwa domowe. W badaniu pominięto kwestie związane z komercyjnym wykorzystaniem potencjału Internetu przez przedsiębiorstwa. Dla poszczególnych lat, na podstawie zestawu cech diagnostycznych, skonstruowano taksonomiczne mierniki syntetyczne, wykorzystując do tego celu metodę TOPSIS. Mierniki te określać będą odpowiednio: poziom skłonności do korzystania z sieci przez obywateli oraz gospodarstwa domowe poszczególnych państw UE, a także dynamikę zmian w analizowanym okresie. Z przeprowadzonych badań wynika, że najwyższą skłonnością do wykorzystania Internetu charakteryzowali się obywatele państw Europy Północnej, a najniższą – Europy Południowej. Do obliczeń wykorzystano środowisko R oraz pakiet Statistica.

Słowa kluczowe: wykorzystanie Internetu, kraje UE, poziom skłonności.