

# Characteristics of the Digital Divide in Romania and Differences in Internet Use in Comparison with Internet Use in Europe

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**Abstract.** *During the development of the digital communication at a global scale, several researchers investigated issues such as the access to Internet or the differentiated use of Internet. Previous studies analyzed the factors that sustain the Internet spreading, that enable the use of Internet instead of traditional media. The barriers and the benefits for several categories of Internet users are considered a necessary piece of knowledge in order to understand and enlarge the future role of Internet in education or in improving life quality. Several theoretical approaches were discussed in order to provide explanations and scenarios for the evolution of the digital gaps between categories of people. The digital divide is understood to be a complex phenomenon and research in this area focuses on determining the factors leading to a differentiated Internet use, as well as the way digital access enhances people's life chances. Therefore, by using quantitative data from nationally representative surveys, the paper aims to investigate the digital divide in Romania both in terms of access and use. Another objective is to analyze the difference in Internet use for different categories of people, in comparison with similar groups from other European countries.*

**Keywords:** *Digital divide; Internet access; Internet use; Digital differentiation.*

## Literature review

### *Perspectives on digital divide and research approaches*

Much of the research on digital divide focused on the gap between those who do or do not have access to the Internet, and on the factors which lead to inequalities in access. In more recent approaches, the interest falls on the concept of digital differentiation, the phenomenon being studied by highlighting and explaining the disparities between individuals in terms of ICT usage (Peter & Valkenburg, 2006). At the beginning of the Internet diffusion, inequalities in terms of access were an important public policy issue as they could determine discrepancies in terms of access to education, labor market, health services or political involvement. However, as the Internet spreading process continues in every society, the literature redefines the term of access from a technological and a social point of view, the last one referring to the ways people use the Internet once they have a connection (DiMaggio & Hargittai, 2001).

There are several approaches regarding the digital divide, each relying on different views about the possible role of technology in one's life. *The growth approach* perceives the digital divide as another inequality determined by the growing social differences, while the *denial approach* states that the divide does not exist. *The disappearing digital divide* perspective states that people will have similar usage patterns despite socio-economic or cultural differences once the access is granted, while *the digital differentiation approach* expects disparities in terms of usage due to distinct conditions (Van Dijk & Hacker, 2003). The last two approaches are more in line with the dynamic changes induced by the Internet. Another important concept that affects the digital divide discussion is that of ubiquitous Internet – the fact that irrespective of location or time, people can be permanently online if they have the necessary devices and this will further reflect differences in terms of resources or usage (McWhorter, 2010).

When considering the scale of the approach, there are studies on global digital divide and social divide. The first tackles the disparities in access and usage between industrialized and developing societies that might be caused by differences in GDP, income, human capital and digital skills, infrastructure, policy, and socio-demographic factors (Norris, 2001; Minghetti & Buhalis, 2010; Gray, 2004). The social or domestic digital divide focuses on the gap determined by the information that is excluded or included at the level of a country that can be determined by socio-economic aspects namely age, gender, race, ethnicity, literacy, education, language skills, residence and living areas, disabilities (Minghetti & Buhalis, 2010; Hargittai, 2002).

Other differences in approaching the phenomenon are given by how the term *access* is perceived. There is a delineation among the *material access* referring to not having computers or Internet connection, the *psychological access* consisting in not

having any digital experience due to fear or lack of interest in technologies, *skills access* referring to an absence of digital skills determined by inappropriate education or support, and *usage access* which implies the privation of significant usage opportunities (Van Dijk, 1999). Nowadays, a common approach of the digital divide includes a focus on the gap between individuals, households or regions at various socio-economic levels with regard to access opportunities, as well as to different ways of using the Internet (OECD, 2001).

Several approaches include aspects related to attitudes, access, skills and usage types (Van Deursen & Van Dijk, 2014). While access differences might diminish, other significant ones could remain in terms of use and differential skills (Chen & Wellman, 2004). The lack of access is associated with disadvantages in financial, educational and cultural resources (Livingstone & Helsper, 2007). Deprivation of access can have negative effects in relation to political information and participation, health and well-being, social capital and social inclusion (Friemel, 2016). The digital access gap requires efforts to be bridged as it can lead to inequality in life chances, resource distribution and inclusion in society. Therefore, the focus in research falls on identifying how people use the Internet, with what consequences, and what are the skills, competences and the factors leading to a differentiated use in terms of benefits.

### *Digital differentiation – factors and usage patterns*

The digital differentiation implies that some Internet activities bring more advantages, more development resources, chances for career, work, education, social status than others that are mainly entertaining or detrimental to users (Van Dijk, 2006). Most approaches rely on the uses-and-gratifications theory (Katz *et al.*, 1974) that states people use media to fulfill a series of needs, to receive gratifications. The various types of media use can positively respond to cognitive needs (including information strengthening, knowledge, understanding); affective needs (strengthening pleasurable and emotional experiences); personal integrative needs (strengthening credibility, confidence, stability, and status); social integrative needs (facilitating the contact with family, friends, and the world) and tension release needs or escapism (Katz, Gurevitch & Haas, 1973).

Social media uses provide opportunities such as meeting people, entertaining, relationship management, product inquiry, discussions, self-disclosure, information seeking, and impression management (Ellison *et al.*, 2007; Krisanic, 2008). People receive mainly utilitarian and hedonic gratifications by fulfilling their interpersonal needs (to create and maintain relationships), enjoyment needs (time passing and pleasure seeking), achievement needs (to develop and outrank others), immersion needs (avoiding reality, escaping), pursuit of fashion (feeling part of the group when following the mainstream tendencies), (Lai & Yang, 2014). Other

classifications might include problem solving, relationship maintenance, persuading others, status seeking or personal understanding (Flanagin & Metzger, 2001).

Another theoretical approach is the media attendance model stating that the expected outcomes are the factor that determines the Internet usage including activity outcomes (entertainment), novel outcomes (information), social (connection, discussion), monetary (shopping), self-reactive outcomes (relaxation), and status related outcomes (improved prospects), (LaRose & Eastin, 2004). People mainly use the Internet either for work and information, or for social media and entertainment (including leisure, online social, technical and information services, academic), (Ellison *et al.*, 2007).

The society is in a constant change, and therefore, demands new skills especially regarding the online world. People rely a lot on the Internet nowadays, on the increasing information in the online environment so the Internet skills are a requirement, and disparities at this level can lead to societal inequalities (Van Dijk, 2005). Digital skills comprise *operational skills* (that refer to using the Internet technology), *formal Internet skills* (navigation and orientation), *information Internet skills* (the actions by which users gratify their information needs), *strategic skills* (using the Internet as a mean to achieve goals and improve one's status), (Van Deursen & Van Dijk, 2010).

The types of uses are influenced by a series of factors as gender, age, socio-economic aspects, income, employment status, education, or ICT experience (Van Dijk, 2005). In terms of gender, men are supposed to possess more Internet knowledge, and therefore they develop better digital skills (Schumacher & Morahan-Martin, 2001). Studies suggest women use the Internet more for communication as well as the young users which also seek entertainment activities. Older users use email more frequently, seek information and shop especially in relation to the health area (Zillien & Hargittai, 2009). Additional correlations show that seniors with a partner, males, with a higher level of education or with a professional occupation use the Internet more often (Peacock & Künemund, 2007). Among seniors, the reasons for not using the Internet in the case of access are the state of motivational indifference if they cannot perceive the usefulness of the act, a deficient knowledge or support to start using it, functional limitations such as memory problems, and structural limitations including costs (Zickuhr, 2013; Lee *et al.*, 2011). Young people get familiar with the Internet at an early age and they are more skillful than seniors, the digital generation having the highest level of Internet skills (De Haan & Huysmans, 2002). Youngsters are familiar with creative forms of expression in the online environment, they do not just consume media, but they produce media, so they need access to more technologies and software, a limitation that will impeditment those in poverty to perform production work (Soep, 2006).

People having a higher income, education, employment status or experience online tend to use the Internet more productively, with more gains than others. The education level is a high predictor of the Internet use and skills. The cognitive resources and the fact that usually the ones with a higher level of education have Internet access, own devices, spend time online, and are aware of the technological advancements reflect on their skills (De Haan *et al.*, 2002). People who have access to social resources, meaning training and support, develop their digital literacy, the social support conditioning in many cases the further usage of the Internet. Students, employees, those with a better socio-economic position or that took Internet courses are likely to use the Internet more and consequently develop their Internet skills (Volman *et al.*, 2005). Digital disparities may also be found when comparing different organizations, the large ones being more prone to innovation adoption and ICT solutions that will improve the skills of the employees (Dewan & Riggins, 2005).

The more time spent online, the better chances to improve Internet related skills and knowledge (Robinson *et al.*, 2003; Hargittai, 2002). According to the frequency of use, the variety of use and the content preferences, users can be differentiated into several categories (Brandtzæg, 2010). A type of Internet user are the *laggards* (occasional users only for Internet services and not for eGovernment; the Internet usage is rarely for private purposes); *confused and adverse users* (low usage of Internet but with high variability, low use for private purposes, shows confusion about the services); *advanced users* (frequent use, shop, use services, eGovernment); *followers* (use the Internet quite frequently, use services and eGovernment less than the advanced users and do not shop online); and the *non-Internet users* (Ortega Egea *et al.*, 2007). When considering the social media behavior, one of the taxonomies includes the non-users, the sporadics, the debaters, the entertainment users, the lurkers, the socializers and the advanced users, this area needing further research (Brandtzæg, 2010).

The digital world has an important role in improving the society, in helping businesses grow, in improving communication, economies or political involvement so the disparities in terms of access or use affect the society as a whole, and determines how much value individuals can derive from the Internet.

## **Methodology**

To assess the characteristics of digital divide in Romania, we proceeded to a secondary data analysis on the indicators provided by the National Institute of Statistics regarding the digital society. We rely on indicators providing information on the Internet access and usage in Romania, using *Tempo data base* (a public data based available at the national Institute of Statistics). Based on the available public data on the national level we analyzed the access and usage (including mo-

tivation) of Internet and online application for different social groups (defined by gender, education, area of residence, age category).

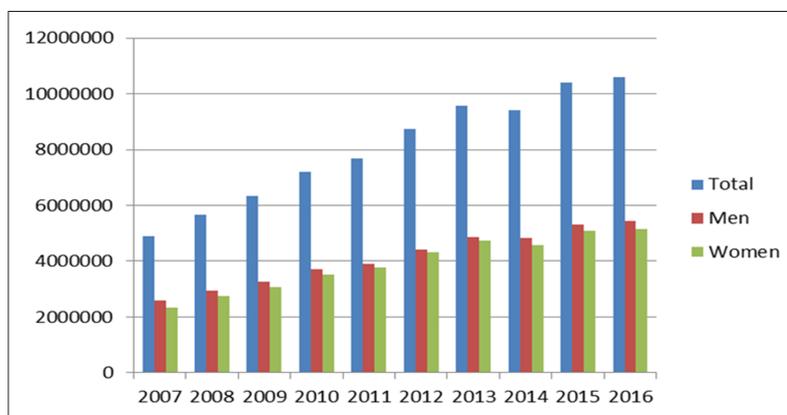
In addition, we have accessed the data collected by Eurostat for similar indicators (for the ones considered at the national level) and compared the digital divide on different social groups in Romania with other countries from the EU28. Current data are gathered through the means of secondary data analysis on the existing public data and are discussed in the context of the literature presented above.

## Results and interpretation

### *Digital divide in Romania: access and use*

According to the data provided by the National Institute of Statistics in 2016 (INS, Comunicat, 5 December 2016), 65% of the households in Romania had access to Internet at home, the majority of these household (65.5%) being located in urban areas. The percentage is significantly lower when compared with the average European level regarding the Internet penetration in households in the EU28 (see Figure 6, bellow), which is estimated at 85% for the same year. Also, the results reveal a digital divide between urban and rural residents in terms of access and Internet penetration.

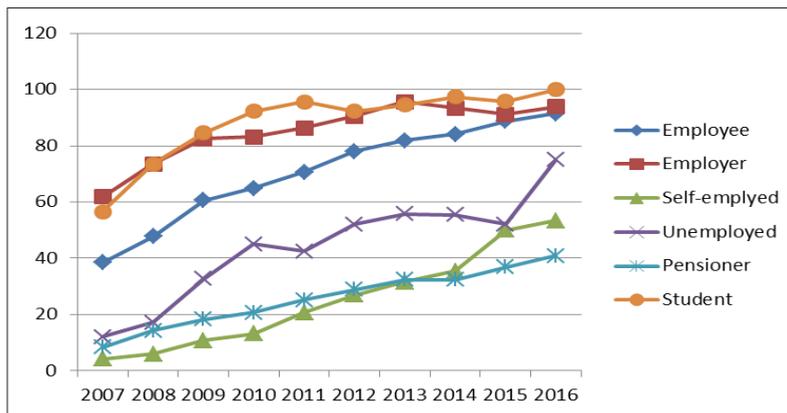
Figure 1 shows that the number of people from Romania (16 to 74 years of age) who have ever used the Internet has continuously increased over the past 10 years, reaching about 10.6 million people out of the total Romanian population in 2016, almost an exponential curve. For example, the increase from 2015 to 2016 was 1.2% of the total population aged between 16 and 74.



**Figure 1.** People from Romania (16-74 years of age) who have ever used Internet, over the past 10 years (divided by gender)

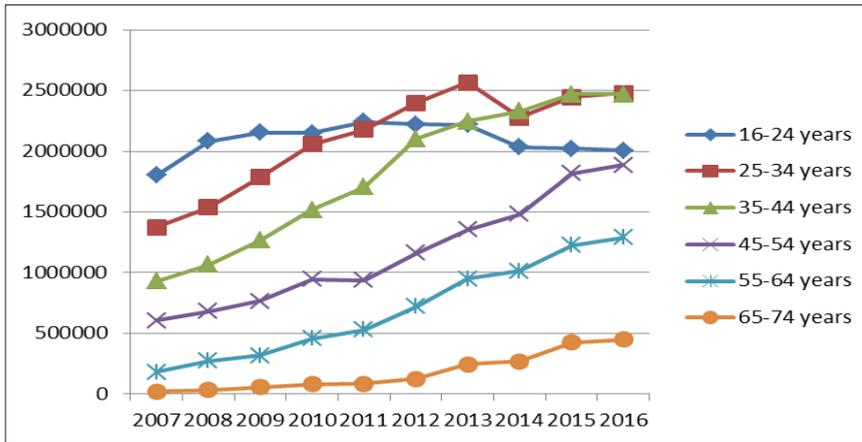
There is a larger percentage of men using the Internet as compared with women and the gap (of approximately 5%) is consistent over the past 10 years. For

example, in 2016, 72.2% of men (16 to 74 years of age) and 67.2% of women (from the same range of age) declared that they have been using the Internet. The gender gap regarding the Internet use is even higher when we compare different age groups – is larger for the 55 + group and highly inter-correlated with the level of education and also with the type of jobs people are/were enrolled in – with people having more technical jobs, or jobs requiring Internet use being more digitally skilled compared with those having jobs in which the Internet use was not common (see Fernández-Ardèvol & Ivan, 2015 for a review on how socio-demographic variables interact in explanatory models on computer use later in life).



**Figure 2.** The percentage of households with Internet access, divided by the status of the house provider (“the head of the house”)

Figure 2 shows the distribution of the Internet access for the Romanian adult population, divided by the working status of the house provider. As we have expected, pensioners are the ones having Internet in their households to a lesser extent compared to those active on the labor market or compared to students – the category that holds the highest level of Internet access and probably Internet use as well. Still, two trends are easily depicted from Figure 2: (1) the ascendant trend of Internet access in the case of pensioners, at least in the past 3 years – this is the category with a visible rapid increase in the Internet access compared to those active on the labor market – which hold a moderate increase in Internet access over the past three years (probably due to a certain level of saturation); (2) a rapid increase in the Internet access of household providers who declared themselves “unemployed”, at least in the past 3 years (the highest increase among all listed categories). This trend shows that Internet access became less a matter of costs and accessibility and more a matter of opportunity, personal skills and motivation.

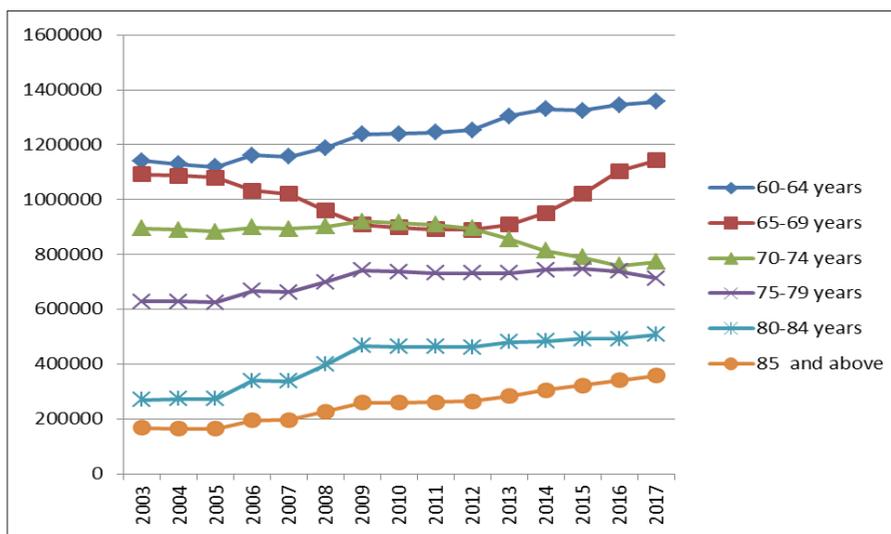


**Figure 3.** The number of households with Internet access, divided by the age group of the house provider (“the head of the house”)

As expected, there is a digital gap between younger and older population, with older people using the Internet to a lesser extent compared to the younger ones. Still, as Figure 3 shows, during the past three years (beginning with 2014) we faced a larger increase in the Internet use at older people, (55+ and 65+) in comparison with the youngest ones. This happened also due to a level of saturation of Internet access in the younger segments of population – where a stagnation in the percentage of Internet users is registered. Consistent with the studies presented in the first part of this paper, such trends can be interpreted by saying that the digital divide in terms of Internet access tends to be diminished in time between different age groups and the digital divide concept will stand more on differences in use and types of applications people use at different stages in their lives.

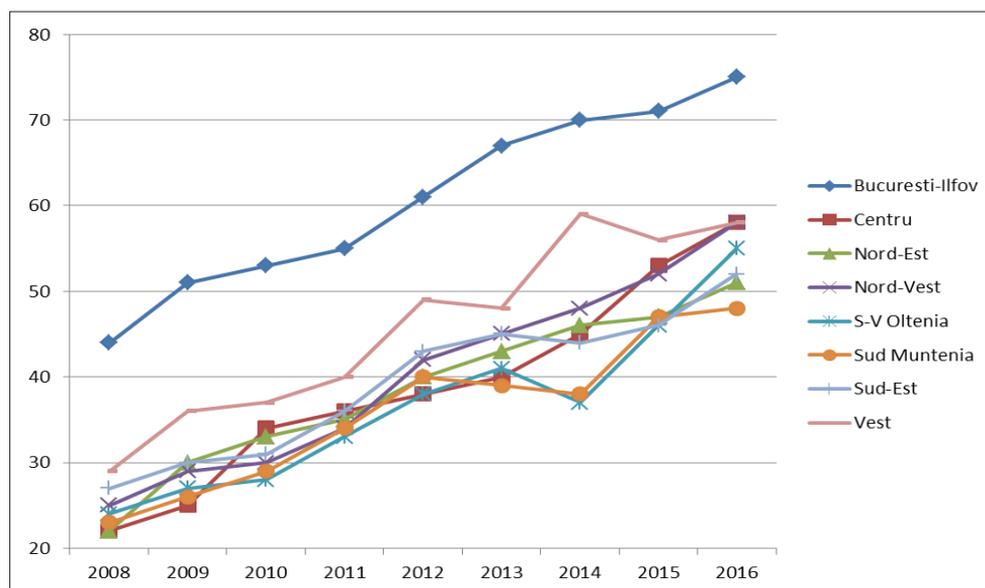
The digital divide between older and younger age segments of population could be seen from a different perspective when analyzing the current demographic trends. Figure 4 shows the evolution of older population in Romania over the past 15 years, and an increasing trend for the category of people between 65-69 years of age, and those having 80 years and above. New demographic projections show an eastward shift of the ageing process; estimates for Romania suggest reaching, after 2040, the highest median age among European countries (UN, 2017).

Still, in the past 15 years we did not find any change, both at the national and at the European level, in collecting more rigorous data on neither the 80+ group, nor on the 85+ group. About the (in)visibility of older-old in the statistics (particularly the 75+ age group and 80+ age group) we discussed *in extenso* in previous works (Ivan, 2017). Practically, we lack data on Internet use for the people 75+ and we can hardly talk about data collection on digital behaviors for the people of 80 years



**Figure 4.** The evolution of older population in Romania over the last 15 years

and above; this in the context of a continuous increase of the 75+ category in the population, over the past 15 years. In the absence of data, it is difficult to discuss the digital divide between older-old and younger-old age groups, and to make any predictions about the Internet use and the potential changes in the older-old group.



**Figure 5.** The percentage of households with Internet access, divided by regions of development in Romania

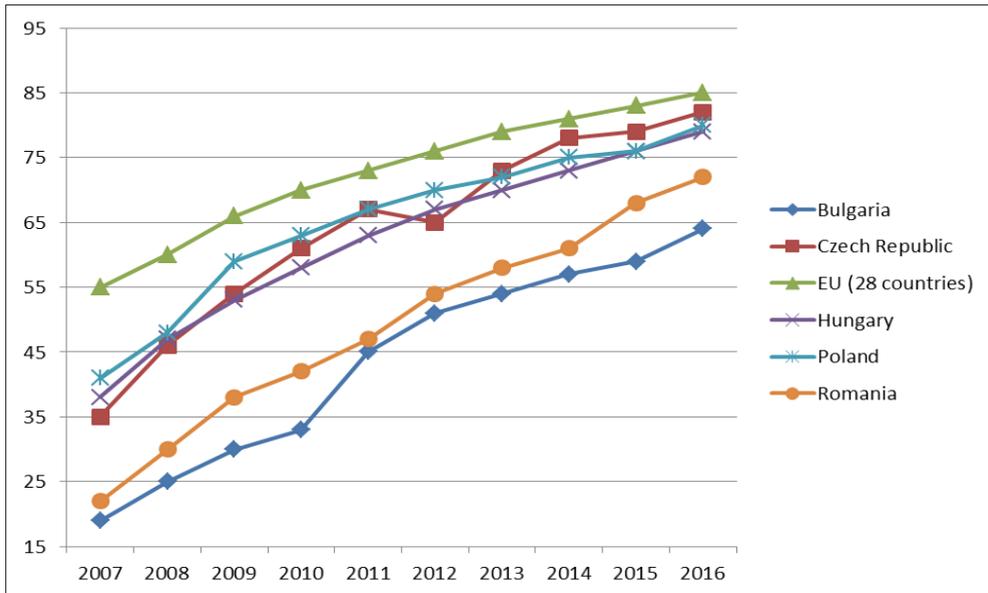
Besides education, which shapes Internet use everywhere in the world, the regional development shapes the access of people to digital infrastructure, and also the economic possibilities people might have to invest in their education and training to acquire different digital skills. Both access and type of use, as well as people's motivation in using the Internet are influenced by the disparities in the economic development at the regional level. Figure 5 shows the Internet access trends over the past 10 years, divided by the 7 regions of development in Romania (including Bucharest-Ilfov region – the most economically developed region, as a significant part of the economic activity of the country is concentrated in the capital city). The gap of Internet use among regions in Romania has increased during past ten years, with developed regions having significantly more Internet users than the less developed ones. For example, Bucharest-Ilfov region has almost a double number of Internet users (in terms of households) compared to less developed regions (for example Sud Muntenia or Nord-Est). This translates in different opportunities for the population living in these regions, access to information, access to the labor market and level of connection in general. The Vest region and Nord-Vest region are also economically developed regions, which manage to have a significant percentage of people that are “connected”. The regional disparities are serious aspects to be considered in the national policies addressing digital gaps, as they also affect the other digital divisions discussed above: based on gender, age cohort, working status, and residential area.

### *Digital divide in Romania relative to countries from Eastern Europe*

The percentage of Internet users in Romania (Eurostat, 2016) was about 72%, less than the European average for this indicator (85% - EU28 countries). Figure 6 shows that all the neighbor countries: Bulgaria, Czech Republic, Hungary and Poland have lower levels of Internet users than the EU28 mean.

Still, Bulgaria and Romania, the least economically developed countries (among the ones considered here in the analysis), have a lesser Internet spread within the population, comparing with the Czech Republic, Hungary and Poland – that have almost reached the EU28 mean in terms of Internet access. Also, Bulgaria and Romania show the most accelerate trend in Internet access over the past 10 years, compared to the countries analyzed here. The two countries managed to reduce the gap when compared to the EU28 average from 40 % to approximately 10 %, between 2010 and 2016. The increase level has been higher (almost exponential) in Romania, compared to Bulgaria, especially starting from 2011.

In order to reveal the types of Internet usage in the above analyzed countries (Romania, Bulgaria, Czech Republic, Hungary and Poland) we used the data collected from the National Institute of Statistics and compared it with data from the Eurostat regarding the digital society. Due to a lot of missing data on some digital



**Figure 6.** The percentage of Internet users (16-74 years of age) in different countries from the Eastern European area, relative to EU28 mean

behaviors (as for example online gaming and online education – types of digital behaviors we could not include due to systematic missing data), we run the analysis only for the past 4 years and for a selected number of digital behaviors (Table 1).

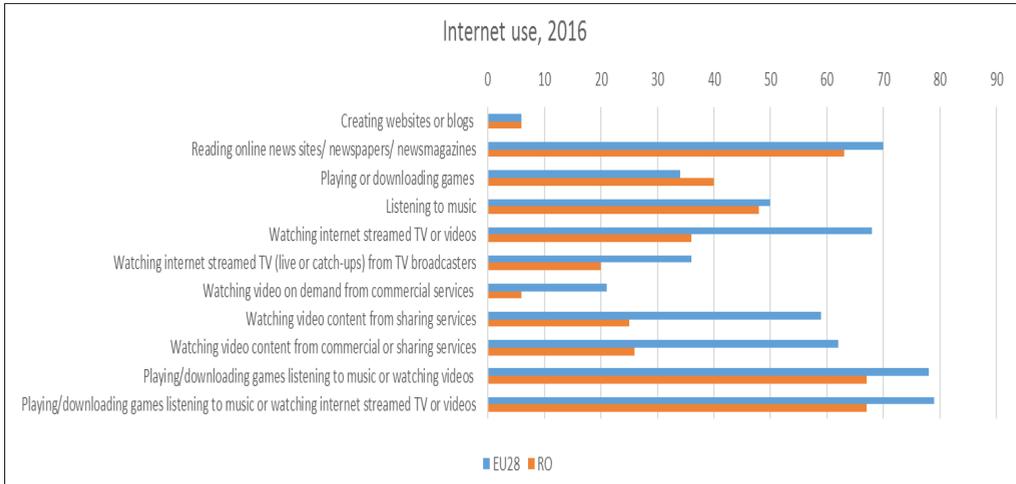
Table 1 shows data on the digital behaviors people declared they had performed on the Internet in the past three months. Romania has registered low percentages on all Internet behaviors in comparison with the EU28 average level and not a very ascendant trend in any of the behaviors listed above, despite the exponential increase in the Internet use we have revealed earlier in the analysis. Besides the email services (sending and receiving emails), which remained relatively constant over time and the Internet banking – the type of behavior which is relatively little spread among the Romanian population, the rest of the digital behaviors listed here have increased in percentages in all countries, including Romania. Still, the level of increase does not correspond to the exponential increase in the Internet access for the Romanian population – aspect discussed earlier in this paper. Two potential explanations arise from the data regarding digital behaviors: (1) the fact that some of the data do not reflect real behaviors in the population and even though they are collected by the National Institute of Statistics, the process of data collection holds some limitations that need to be corrected; (2) the fact that the digital gap discussed in the current paper is defined more and more in terms of digital behavior than in terms of digital access – at least at the European level – and that Internet access/ penetration in households becomes a

**Table1.** Digital behaviors in Romania and countries from Eastern Europe, relative to the EU28 average level

Country/Year	Digital behaviors	2013	2014	2015	2016
Bulgaria	Emails (send/receive)	43	44	44	43
	Online calls	34	46	47	48
	Social networks	37	40	42	45
	Uploading content to be shared		19	21	21
	Looking online for information	35	41	35	38
	Reading news online (sites, newspapers)	38	41	40	41
	Internet banking	5	5	5	4
Czech Republic	Emails (send/receive)	70	74	76	77
	Online calls	39	36	33	33
	Social networks	36	40	41	45
	Uploading content to be shared		15	19	33
	Looking online for information	63	69	68	74
	Reading news online (sites, newspapers)	63	69	70	67
	Internet banking	41	46	48	51
EU (28)	Emails (send/receive)	67	68	69	71
	Online calls	25	29	29	32
	Social networks	43	46	50	52
	Uploading content to be shared		26	29	28
	Looking online for information	59	64	61	66
	Reading news online (sites, newspapers)	48	52	54	58
	Internet banking	42	44	46	49
Hungary	Emails (send/receive)	68	71	68	73
	Online calls	28	40	40	42
	Social networks	56	60	61	66
	Uploading content to be shared		37	42	36
	Looking online for information	58	66	61	70
	Reading news online (sites, newspapers)	60	65	62	70
	Internet banking	27	31	34	35
Poland	Emails (send/receive)	51	53	54	58
	Online calls	24	28	28	28
	Social networks	35	37	41	44
	Uploading content to be shared		12	12	15
	Looking online for information	45	50	42	57
	Reading news online (sites, newspapers)	27	47	47	58
	Internet banking	32	33	31	39
Romania	Emails (send/receive)	42	43	43	42
	Online calls	10	23	24	27
	Social networks	33	36	44	44
	Uploading content to be shared		14	21	18
	Looking online for information	26	36	26	35
	Reading news online (sites, newspapers)	29	38	37	38
	Internet banking	4	4	5	5

less important indicator in understanding people’s digital behavior (what they actually do on the Internet).

In terms of behaviors related to media consumption on the Internet, Romania has lower values than the European mean in 2016 at almost all categories. We have exceeded this mean only for the category playing or downloading games with 6% and registered the same percentage for creating websites or blogs.



**Figure 7.** Internet use in 2016, Romania & EU28 mean

When divided by gender, the data show that women use the Internet less than men both at the national and at the EU level on all the above-mentioned categories. The divide persists in terms of age and status as well, the younger groups of people and those that are employed consuming more media content online. Although in terms of Internet access there is consistent progress at the national level, in terms of differentiated use there are considerable gaps between Romania and the European countries.

### Conclusion

The digital differentiation approach states that if Internet access gaps are bridged, Internet usage gaps or differentiations by skills can occur (Van Dijk & Hacker, 2003). According to this perspective, the characteristics of Internet users play an important role in influencing the Internet adoption and use. The results support this perspective as there is a clear ascending trend in Internet use. If in terms of gender there is still a consistent gap to be bridged, the access and use of Internet by age and status indicate that Internet access is less a matter of costs and accessibility and more one determined by personal skills and motivation. The digital divide in terms of access tends to decrease between different age groups,

the actual divide standing more on differences in use and applications for different life stages.

At a national level, in the last ten years, the gap between regions regarding the Internet use in Romania has increased and led, by consequence, to a differentiated access to opportunities. Although in terms of use the values for Romania increased, the levels for all the Internet behaviors were lower than those of the other EU member states or than the European mean. At the European level, the Internet access became less relevant when analyzing the digital divide, while people's digital behavior drew more attention.

Policies are required to help bridge the gaps in terms of access and use to avoid structural inequalities that can be detrimental to large parts of the society. The Internet use is differentiated by gender, age, status and socio-economic conditions. While some use basic applications and entertainment functions, those who are among the categories with better digital skills or have more experience can use complex services and create more opportunities for themselves, therefore explaining the disparities between individuals.

### **Future research**

The current paper reveals that despite the exponential increase of Internet access and use for all categories of population in Romania over the past 10 years, we still registered low percentages of typical Internet behaviors, in comparison with EU28 average level (e.g. Internet banking, reading news online). We discuss two potential explanations for such paradox: the fact that some of the data do not reflect real behaviors in the population; and the presence of digital divide (second level of digital divide) – defined in terms of type of digital behaviors, but not in terms of access (first level of digital divide). Consequently, two research lines worth being explored in future research studies are: (1) the adequacy of official statistics to study digital gaps of different groups of population. In this respect, we have recently contributed (see Ivan, 2017; 2018) in understanding the gaps in the national data on digital divide research with focus on older people, opening the discussion of inclusion/exclusion regarding Internet and ICT use: some categories of population (as for example older-old) are systematically under-represented, as the data favors the mainstream individuals, providing little nuanced information about discrete categories of population (ex: older women; parents; grandparents); (2) when we refer to digital divide, several layers should be included: access and use (first type of digital divide); the diversity of digital related behaviors (first type of digital divide) and digital skills (third type of digital divide). Most of the data coming from the official statistics focus on the first type of digital divide and provide little understanding of the other two layers presented here, or of the relations between different forms of digital gaps. Further research should include the inter-

play between the three digital gaps at different categories of population. It might be the case that for rural areas, digital divide in terms of access to technology and Internet use is the main point of discussion, while in urban areas, digital gaps in terms of skills and literacies are more relevant to be analyzed.

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