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The issue of digital divide in rural areas of the European Union

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Summary. The increasingly popular use of ICT in different areas of life results in changes of the situations of individuals and entities. However, along with the new possibilities of socio-economic development, come new risks related to the rise of a new type of inequalities. One of such threats is the digital divide or – in other words – the lack of equal access to the opportunities offered by the Internet and other ICT. The phenomenon of the digital divide applies to both individuals and areas or even countries. The aim of this paper is to introduce the digital divide and the factors influencing the lack of digital convergence with particular emphasis on rural areas of the European Union. In EU's rural areas there is an additional hindrance to achieving digital convergence similar to the urban areas – that is the aging of the population and the progressive depopulation of the countryside.

Introduction

The development of information and communication technologies (ICT) and their widespread use in various areas of life brings changes to the circumstances of individuals and entities. The new opportunities that arise through the development of technology have the potential of being a positive impact, by increasing both the efficiency and competitiveness of the economy and the quality of life. But we need to keep in mind that the progressive development also comes with certain risks. Not all people have the knowledge required to use the potential of the ICT to its fullest.

The aim of this article is to introduce the issue of digital divide and the factors influencing the lack of digital convergence, focusing on the rural areas of the European Union. Due to the vastness of the subject, the paper adopts the analytical and descriptive method. The problem of the digital divide in rural areas also occurs in countries with a high level of economic development, such as the United States and member states of the European Union, having a negative impact on the prospective development of these areas. The factors which influence the phenomenon of digital divide in rural areas are different than in urban areas.

The article describes the phenomenon of the digital divide, the influencing factors and references the issues the European Union faces in this regard.

1. The digital divide

The dynamic development of the Internet and related ICTs allows individuals interested in acquiring information and having the skill necessary for doing so to access a potentially unlimited amount of data. However, with the new possibilities of socio-economic development, appear new risks related to the emergence of a new type of inequality. The phenomenon describing differences in access to the Internet and thus - the information – is referred to as the digital divide.

The digital divide in literature is usually defined on two planes: material and immaterial. The material plane addresses the physical access to a computer and the Internet by the person (first-order digital divide); the immaterial plane encompasses the knowledge, motivations and needs fulfilled by the access (second-order digital divide) (Bednarczyk, 2014). The inequality in the access to digital technologies due to differences in the distribution of resources, both material and temporal, mental, social and cultural has been presented by Dijk (2010), divided into four types of access to the new media (Dijk, 2010):

- a) motivational access – the primary factor in the motivation for using new media because of the possibilities offered by them;
- b) physical and material access – that is, having the possibility to use a computer or other device that allows access to Internet services and an Internet connection;
- c) competence access – the ability to use the hardware and software; there are three groups of digital competence:
 - operational skills – handling equipment and software,
 - information skills – searching, selecting and processing the information obtained,
 - strategic skills – the ability to achieve one's objectives and improve the position of the person by means of ICTs;
- d) utilitarian access – the frequency of computer and Internet use and the variety of the undertaken activities.

The previously mentioned lack of access to various resources can adversely affect the different types of access to new media (see tab. 1), effectively causing the deepening of the digital divide.

Table 1. Resources affecting various types of access to new media

Type of access	Type of resource
Motivational access	<ul style="list-style-type: none"> – time resources – intellectual resources – material resources – social and cultural resources
Material access	<ul style="list-style-type: none"> – time resources – intellectual resources – social and cultural resources
Competence access	<ul style="list-style-type: none"> – intellectual resources – social and cultural resources
Utilitarian access	<ul style="list-style-type: none"> – time resources – social and cultural resources

Source: based on Dijk (2010), p. 250–255.

There are measures which can be undertaken in order to reduce the risk of digital exclusion, and they can be influenced by both the individuals at the risk of exclusion and government entities (Jastrzębska, Jastrzębska, 2012). Namely:

- providing access to quality infrastructure and its modernization,
- reducing the budgetary constraints which hinder or impede access to new technology for potential users,
- providing/gaining qualifications enabling to actively use ICTs,
- motivating potential users to make use of new technologies.

It has been very quickly pointed out that certain groups are more at risk of digital exclusion than others. The groups most vulnerable to digital exclusion are: the elderly, pensioners and the retired, people with low education, the unemployed, farmers and residents of rural areas, the poor and living on welfare, the disabled. Due to the fact that computer and internet access and the ability to use them proficiently may significantly affect the quality of life of individuals, increasing their participation in socio-economic life, the digital divide becomes a significant issue not only for the particular person but for society as a whole (Batorski, Płoszaj, Jasiewicz, Czerniawska, Peszat, 2012). The following section provides an overview of the factors affecting the digital divide and digital convergence on both individual and global (national) levels.

2. What influences the digital divide?

Digital exclusion applies not only to individuals and can be considered on a global level (between continents, regions and groups of neighboring countries), re-

gional (between countries) or local (within a country). In the subject literature the dividing line lies between “developed countries and developing countries” and “urban areas and rural areas.” Typically, in the case of determining the causes of differences between countries, variables such as the level of availability and use of technology are the most prominent, as is the level of economic development or support from the government.

The digital divide can be a serious problem not only from the point of view of social exclusion and increasing inequality, but due to the large impact of ICT on the growth of productivity it can be a significant barrier to economic growth and improvement of the competitiveness of individual countries. The ICT are not only the basis for developing new, creative industries (related to new products and services), but due to their rising popularity, they increase operational efficiency and productivity in the other, more traditional industries. (Park, Choi, Hong, 2015). The lack of adequate competence to use ICT is becoming increasingly not just a problem of the entity affecting their ability to find a better job, but also (if it occurs commonly) is a factor in the development of the region or country’s potential.

Goldfarb and Prince (2008) have already pointed out in their research on the use of the internet by various groups of US users, that education and income positively correlates with Internet literacy, but surprisingly correlates negatively with time spent online. The situation was reversed in the case of low-income participants of the research. This phenomenon was partially explained when the reasons for internet use in both groups have been backtracked. In the case of the first group, the people were mainly maintaining contact and work, in the second – it was mainly entertainment. Despite the fact that much time has passed since that study, the cost of Internet access are lower and what is most important – the consumer’s behaviors might have changed, the implied issue needs to be addressed: the mere possibility of access to the Internet does not necessarily translate into improved quality of life and social inclusion of disadvantaged groups. Also, studies conducted with the use of the Internet Consumption Model have shown differences in the spread of Internet access between the inhabitants of developed and developing countries (due to the amount of GDP per capita). In developed countries, the popularization of the Internet has been more rapid than in the developing countries. The study also showed the importance of factors related to the perception of ease of use and perceived usefulness for individuals, besides the price. Promoting internet access from this angle could accelerate the digital convergence of developing countries significantly (Zhang, 2013).

The research regarding the use of ICT by individual countries (which translates to the size and the scale of the divide) are carried out both at the level of general aggregated indices such as the ICT Development Index (ITU 2016) or the Network Readiness Index (Weforum, 2016) and in other divisions due to e.g. the level of economic development. Research conducted at country level shows a decrease in the digital divide globally (Doong, Ho, 2012), in some cases even suggesting that the dissemination of ICT in less developed countries progresses faster than in developed countries (James, 2009). Park et

al. (2015) have identified three groups of countries because of the level of digital convergence and the speed of digital convergence progression together with the indication that the relationship is the following: the lower the level of digital convergence, the higher the speed of digital convergence. Given the fact that the countries in third group, with the lowest digital convergence, are all very diverse in terms of both cultural and economic potential (e.g. The United Arab Emirates, Japan, Singapore as well as Namibia, Nicaragua and Ghana) there have been attempts to identify the factors with the most impact on reducing the digital divide. The results turned out to be significant due to the fact that they not only allowed to point out the factors having the greatest impact on digital convergence, but also determined the vector and the strength of that impact. And thus, the higher these factors are (the GDP per capita, tertiary education entrance rate and the expenses on education), the greater the probability of the country belonging to a group with a high degree of digital convergence. An inverse relationship can be observed in the case of the ratio of urban population. If the rate is higher, the greater the chance that the country will be accounted into a group with lower levels of digital convergence. Among the factors affecting digital convergence the most flexible are tertiary education entrance rate and education investments (Park et al., 2015).

The research on the factors affecting the digital divide and its convergence, on the differences between both entities and countries, has been conducted for a while now, and allows pinpointing a couple of basic trends and issues. In the case of entities, we can face an actual problem of a digital divide stemming from the limitations in both material and competence access to a computer, the Internet and other modern technologies, but it also might be a conscious decision on the entity's part, depending on their needs and approach to technology (Mitzner et al., 2010; Selwyn, 2006) or their education and wealth (Goldfarb, Prince, 2008). When it comes to global-scale differences between the countries, there are far more factors to be named and among them are i.e.: the level of economic development (usually calculated as per capita GDP), the share of services in GDP, the quality of the infrastructure available and the level of education in the society. Attention is also increasingly drawn to the social and cultural conditions and their importance in preventing digital exclusion (Pick, Nishida, 2015).

In the following paragraphs the differences occurring within countries will be discussed, focusing on the gap between urban and rural areas.

3. Rural digital divide in the European Union

The term "rural areas" refers to those parts, which have been least subjected to urbanization, and thus are associated with a scarcer dispersion of both residents and business. In addition, rural areas are more or less affected (depending on the distance from markets and access to services) by the problem of peripheralization/ marginalization (Grimes, 2000). The problem of the digital divide in the rural areas is a concern not only for developing countries but also for those highly developed, like the United States

(Pick, Sarkar, Johnson, 2015), Japan (Nishida, Pick, Sarkar, 2014), Australia (Park, 2016) or the European Union (Vicente, López, 2011).

The problem of the digital divide in rural areas is determined by factors different than in the case of urban areas and can affect both the supply and the demand side in terms of physical access to the Internet. The issues related to the supply and demand can be closely interlinked and what is worse – they can be mutually supportive, causing a slow rural digital convergence. An example of such interdependence may be higher cost of building the necessary infrastructure due to the population dispersion / distance between potential buyers (supply side) and low interest (or lack of it – the demand side), which will affect the lower profitability of the investment (Rowe, 2003). It should also be noted that merely providing physical access to ICTs will not solve the general problems of development of rural areas and the received benefits will be limited to specific areas and associated with other phenomena (e.g. the migration from urban areas) (Malecki, 2003).

The digital vicious cycle is the growing risk of social exclusion of people not possessing Internet access, as a result of the increasingly widespread use of the Internet as the default communication medium (Warren, 2007). Along with the deepening of the phenomenon, the groups at risk of digital exclusion are becoming disenfranchised by more and more areas of social interaction being moved to a medium to which they have no access to. This threat is particularly evident in rural areas. A major problem is physical access, understood as the availability of ICT infrastructure, especially the usually inferior hardware as compared to urban areas and the so called "mutating divide" (the pace of technological changes in Internet access can result in rural areas being permanently delayed in the implementation of the resources readily available in urban areas). It is not without significance that the potential benefits for the inhabitants of rural areas supplied by ICT are greater than in the case of the residents of urban areas, which is due to the distance barriers and fewer alternatives available. If we outline the problem in that way, the risks associated with digital exclusion and lack of access to ICT in rural areas have more severe consequences for its inhabitants, and can deepen marginalization and social exclusion. An additional obstacle is the fact that the solutions usually used to combat digital exclusion (such as training, public Internet access points) are less effective due to the already mentioned distance barrier and the dispersion of potential beneficiaries (Warren, 2007).

Broadband Internet access in rural areas in the European Union is seen as one of the important areas for action in implementing the policies pertaining to ICT popularization, and the creation of the European Information Society (European Commission, 2010). The studies conducted show a number of factors affecting both the lower level of digital convergence in rural areas and the lower level of Internet adoption. One of the important and already previously mentioned factors is inadequate ICT infrastructure and less efficient measures to compensate for differences in physical access and competence access. In rural areas there are fewer investments made in the broadband infrastructure

(and when they are undertaken, they usually result in a local monopoly) and the actions of government are not always sufficient. An additional issue is the demographic trends occurring in the majority of European Union member countries (and especially in the EU-15). The European society is aging which is especially noticeable in rural areas – young people in search of better opportunities leave their hometowns. This results are, on one hand the slow depopulation of these areas (less reason to invest in infrastructure – difficult material access) and on the other – the remaining older generation usually shows a lower level of Internet adaption (both due to the lack of need as well as a lower level of qualifications needed to use ICT) (Preston, Cawley, Metykova, 2007).

The issue of the digital divide in rural areas is an important issue both as a research problem and from the point of view of decision-makers at various levels (both public administration and companies operating in the telecommunications market). The differences in material and competence access, and the permanent “backwardness” in terms of access to the latest ICT affects the prospects for development and can lead to deepening not only the digital divide but also social exclusion.

Conclusion

The problem of the digital divide is so important because computers and Internet communication can be an immense facilitator in establishing new and maintaining existing relationships, allowing for easier acquisition of education, enabling to work remotely and many more. It needs to be noted that the ability to use ICT is less and less just a convenient tool and became a necessity and requirement in the rapidly changing job market. In addition, the lack of qualifications is no longer a problem only for the affected units – the lack of skilled labor largely affects the lower productivity and poor competitive position of the whole economy.

The problem of digital divide is particularly intensely experienced by residents of rural areas and this is not a phenomenon limited only to countries with a lower level of economic development. The problem of the digital divide in rural areas is also an issue in highly developed countries such as the United States, Japan and European Union member countries.

Due to the barriers of distance and remoteness of rural areas and the lack of available alternatives, the potential benefits of digital convergence to these areas are particularly significant. Unfortunately, to enable a better use of the opportunities offered by ICT for rural population one needs to faces problems both of ensuring the quality of infrastructure and combating the lack of qualifications of the beneficiaries. In addition, the previously mentioned distance barrier, combined with the often high dispersion of potential beneficiaries hinders the effective implementation of ICT policies of the European Union. An additional problem in the case of rural areas for the Member Countries of the EU is the unfavorable demographic situation. The aging population results in the younger generations leaving their hometowns, which causes a slow depopulation, and

older generation usually has neither the necessary skills to effectively use ICT nor (more importantly) do they realize the potential benefits and thus not feel the need of obtaining competences in this area.

Bibliography

- Batorski, D., Płoszaj, A., Jasiewicz, J., Czerniawska, D., Peszat, K. (2012). *Diagnoza i rekomendacje w obszarze kompetencji cyfrowych społeczeństwa i przeciwdziałania wykluczeniu cyfrowemu w kontekście zaprogramowania wsparcia w latach 2014–2020*. Warszawa: Ministerstwo Rozwoju Regionalnego.
- Bednarczyk, D. (2014). Przeciwdziałanie cyfrowemu wykluczeniu (e-integracja) w Polsce. *Biuletyn EBIB, Gromadzenie i zabezpieczanie danych cyfrowych*, 9 (154).
- Dijk, J. van (2010). *Spoleczne aspekty nowych mediów*. Warszawa: Wydawnictwo Naukowe PWN.
- Doong, S.H., Ho, S. (2012). The impact of ICT development on the global digital divide. *Electronic Commerce Research and Applications*, 11 (5), 518–533. DOI:10.1016/j.eelerap.2012.02.002.
- European Commission (2010). Digital agenda for Europe 2010–2020: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Luxembourg: EUR-OP.
- Goldfarb, A., Prince, J. (2008). Internet adoption and usage patterns are different: Implications for the digital divide. *Information Economics and Policy*, 20 (1), 2–15. DOI:10.1016/j.infoecopol.2007.05.001.
- Grimes, S. (2000). Rural areas in the information society: diminishing distance or increasing learning capacity? *Journal of Rural Studies*, 16 (1), 13–21. DOI:10.1016/S0743-0167(99)00027-3.
- ITU (2016). *ICT Development Index 2016*. Retrived from: <http://www.itu.int/net4/ITU-D/idi/2016/> (28.12.2016).
- James, J. (2009). Information technology use among individuals in rich and poor countries: The disappearing divide. *Telematics and Informatics*, 26 (4), 317–321. DOI:10.1016/j.tele.2009.03.002.
- Jastrzębska, A., Jastrzębska, W. (2012). Wykluczenie cyfrowe – przyczyny, zagrożenia i bariery jego pokonania. Studium przypadku. W: *Nierówności społeczne a wzrost gospodarczy. Modernizacja dla spójności społeczno-ekonomicznej w czasach kryzysu*, issue 25 (p. 91–104). Rzeszów: Uniwersytet Rzeszowski.
- Malecki, E.J. (2003). Digital development in rural areas: potentials and pitfalls. *Journal of Rural Studies*, 19 (2), 201–214. DOI:10.1016/S0743-0167(02)00068-2.
- Mitzner, T.L., Boron, J.B., Fausset, C.B., Adams, A.E., Charness, N., Czaja, S.J., Sharit, J. (2010). Older adults talk technology: Technology usage and attitudes. *Computers in Human Behavior*, 26 (6), 1710–1721. DOI:10.1016/j.chb.2010.06.020.

- Nishida, T., Pick, J.B., Sarkar, A. (2014). Japan's prefectural digital divide: A multivariate and spatial analysis. *Telecommunications Policy*, 38 (11), 992–1010. DOI:10.1016/j.telpol.2014.05.004.
- Park, S. (2016). Digital inequalities in rural Australia: A double jeopardy of remoteness and social exclusion. *Journal of Rural Studies*, 1. DOI:10.1016/j.jrurstud.2015.12.018.
- Park, S.R., Choi, D.Y. i Hong, P. (2015). Club convergence and factors of digital divide across countries. *Technological Forecasting and Social Change*, 96, 92–100. DOI:10.1016/j.techfore.2015.02.011.
- Pick, J.B., Nishida, T. (2015). Digital divides in the world and its regions: A spatial and multivariate analysis of technological utilization. *Technological Forecasting and Social Change*, 91, 1–17. DOI:10.1016/j.techfore.2013.12.026.
- Pick, J.B., Sarkar, A., Johnson, J. (2015). United States digital divide: State level analysis of spatial clustering and multivariate determinants of ICT utilization. *Socio-Economic Planning Sciences*, 49, 16–32. DOI:10.1016/j.seps.2014.09.001.
- Preston, P., Cawley, A., Metykova, M. (2007). Broadband and rural areas in the EU: From technology to applications and use. *Telecommunications Policy*, 31 (6–7), 389–400. DOI:10.1016/j.telpol.2007.04.003.
- Rowe, B. (2003). Rural technology deployment and access: successes upon which to build. *Government Information Quarterly*, 20 (2), 85–93. DOI:10.1016/s0740-624x(03)00034-0.
- Selwyn, N. (2006). Digital division or digital decision? A study of non-users and low-users of computers. *Poetics*, 34 (4–5), 273–292. DOI:10.1016/j.poetic.2006.05.003.
- Vicente, M.R., López, A.J. (2011). Assessing the regional digital divide across the European Union-27. *Telecommunications Policy*, 35 (3), 220–237. DOI: 10.1016/j.telpol.2010.12.013.
- Warren, M. (2007). The digital vicious cycle: Links between social disadvantage and digital exclusion in rural areas. *Telecommunications Policy*, 31 (6–7), 374–388. DOI:10.1016/j.telpol.2007.04.001.
- Weforum (2016). *Global Information Technology Report 2016*. Retrived from: <http://reports.weforum.org/global-information-technology-report-2016/> (28.12.2016).
- Zhang, X. (2013). Income disparity and digital divide: The Internet Consumption Model and cross-country empirical research. *Telecommunications Policy*, 37 (6–7), 515–529. DOI:10.1016/j.telpol.2012.12.011.

PROBLEM WYKLUCZENIA CYFROWEGO OBSZARÓW WIEJSKICH W UNII EUROPEJSKIEJ

Słowa kluczowe: wykluczenie cyfrowe, obszary wiejskie, konwergencja, Unia Europejska

Streszczenie. Coraz popularniejsze wykorzystywanie ICT w różnych strefach zmienia warunki funkcjonowania jednostek i podmiotów gospodarczych. Wraz jednak z nowymi opcjami rozwoju społeczno-ekonomicznego pojawiają się również nowe zagrożenia związane z pojawieniem się nowego typu nierówności. Takim zagrożeniem jest wykluczenie cyfrowe, czyli brak równego dostępu do możliwości oferowanych przez internet i inne ICT. Zjawisko wykluczenia cyfrowego dotyczy zarówno jednostek, jak i obszarów czy państw. Celem artykułu jest przybliżenie zjawiska wykluczenia cyfrowego oraz czynników wpływających na brak konwergencji w tym zakresie ze szczególnym uwzględnieniem obszarów wiejskich w Unii Europejskiej. W przypadku obszarów wiejskich UE dodatkowym problemem w osiągnięciu cyfrowej konwergencji na poziomie zbliżonym do poziomu obszarów zurbanizowanych jest starzejące się społeczeństwo i postępujące wyludnienie wsi.

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Cytowanie

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