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CHARACTERISTICS OF THE E-DEVELOPMENT POTENTIAL OF LOWER SILESIAN VOIVODESHIP

Abstract: The paper argues that the present transformations of regional systems are determined by forming the information society and technological changes. An efficient policy of the region development ought to be facilitating the cooperation among particular elements of its innovation system. Thus, an important factor from the point of view of mobilizing the local authorities to act in favour of information society is their ability to make independent initiatives in this matter, resulting from the possessed endogenous potential. The paper offers new reading of this potential, which when taken together constitute the basis for thinking about regions, society and space through the lens of 'new e-development'. It further suggests that the higher the value of the e-development potential indicator – the bigger is the ability of counties to prepare programs and projects regarding e-development, the financing and realisation by their own efforts.

Key words: regional e-development, information society, e-development potential indicator, Lower Silesia

JEL codes: R110, R580, O330

1. Introduction

The modern transformations of regional systems are, inter alia, a consequence of forming the information society and technological changes, in particular the progress in terms of informatics and telecommunication (ICT sector), as well as tendencies to localize the high-tech industries in regions offering beneficial conditions of development. Determinants facilitating the growth of innovation of regions are stimulated by: intense development of industry, educational system, existence of highly qualified work and the activity of local authorities (Domański, 1997, p. 29). An efficient policy of the region development ought to be facilitating the cooperation among particular elements of its innovation system. The consequence of such

an action is faster dissemination of knowledge resulting in stimulation of innovation, the positive effect of which on creating new relations in spatial socio-economic development is invaluable (Brown, 1968, pp. 13–17). Taking into account the abovementioned contemporary conditions of development of regions the main aim of the elaboration was identified as characteristics of the e-development potential of Lower Silesia in counties section. The paper offers new reading of this potential, which when taken together constitute the basis for thinking about regions, society and space through the lens of 'new e-development'. Measurement studies related to the e-development potential indicator were carried out in the years 2009–2011.

It ought to be underlined that raising the competence level in terms of planning the economic development among the representatives of units of local government should take place basing on the modern ICT tools. However, it is not a sufficient condition. As it was clearly shown in "Social diagnosis 2009" (Czapiński, Panek, 2009, p. 30), the development of the Internet usage by citizens is only partially dependent on the increase of the Internet accessibility in households – there are other, strongly influential factors not connected with the physical access (*e.g.* demographic, cultural, economic). They make that, in the examined regions, the gain of the percentage of households having the Internet access is causing strongly diversified effect of gain of the percentage of users in these regions. Additionally, analysing the results of available research (Głomb, Czerniawska, 2010, p. 45), serious evidence has been identified to introduce a thesis that the strongest obstacles in using the Internet by citizens of neighbouring voivodeships are: lack of competence, motivation, skills and needs. The aforementioned conditionings set the necessity of implementing a new formula in managing the regional resources. Thus, an important factor from the point of view of mobilizing the local authorities to act in favour of information society is their ability to make independent initiatives in this matter, resulting from the possessed endogenous potential (compare Rodríguez-Pose, 2013, pp. 1034–1047). That ability on the level of counties is measured by the so called e-development potential indicator. The higher the value of the indicator – the bigger is the ability of counties to prepare programs and projects regarding e-development, the financing and realisation by their own efforts.

2. Information society in the socio-economic space of regions

The building process of information society is strictly connected with the development of ICT sector. It is a new society system forming in countries of high level of technological progress, where the information management requires using new techniques of gathering, processing, passing and utilizing the information (Kraska, 2006, p. 376). The influence of ICT on the development of spatial units can adopt many forms. First, through the fact of a constant growth of the number of computers in the world, it is possible to gather and spread the data on a scale that has never been observed in the past yet (UNCTAD, 2015). This fact results in increasing amount of information implicating the formation of new knowledge (compare Roberts, 2000, p. 434) that, being one of the modern factors of regional development,

also determines the shaping of a new structure of economic region. Moreover, in particular by using the achievements of e-learning, the ICT significantly facilitates the transfer of knowledge not only by the exchange of data itself, but also gives a possibility of an access to information and limit the individual cost of training (compare OECD, 2001, p. 114). Therefore, the opportunities brought by ICT are able to and are more frequently used to a greater degree and on different areas. Promising is the fact of undertaking the activities on the highest grade, which is the country and the region, and not only by the enterprises that directly serve the development of information society on a given area and prevent the digital exclusion of this specific society. ICT is a factor that highly stimulates the economic growth and the employment rate. It is responsible for one fourth of GDP increase and 40% of productivity increase in the European Union (OECD, 2004, p. 2). The differences of economic results between the industrial regions can be explained to a greater space by the amount of investments in ICT, the level of research on the aforementioned and the range of its usage, as well as the level of competition of economic sectors connected with the information society (*European Commission Report*, 2005). It ought to be clearly underlined that the momentum of the technological diffuse is selective, both socially and functionally. The time diversity of the access of nations, countries and regions to the might of technology is a key reason of the inequality in society. The excluded regions are scattered culturally and spatially: they exist in poor, rural regions of China and India, in African slums, in downtowns of American cities or in French *banlieues* altogether (Castells, 2008, p. 47). No matter on the geographical location, though, the formation of the information society cannot be comprehended without taking under consideration the interactions of two relatively independent trends: the development of new information technologies and the efforts undertaken by the old society to reorganize itself using the strength of technology in such a way that it would serve the technology of strength. The results of the interactions between the technology and the society are basically undetermined, because they are dependent on stochastic relations of a huge amount of quasi-independent variables (Castells, 2008, p. 71).

3. Methodology of the e-development potential indicator construction

To get an actual picture of the innovative differentiation of the socio-economic development in Lower Silesian voivodeship, a measurement involving the so called e-development potential indicator (Kuflowski, Przanowski, 2009) has been suggested, which was measured on the level of units of county local government. To construct the aforementioned, three fragmentary indicators have been used: the indicator of educational, economic and innovative potential. Within each of the indicator, the received values have been standardized, granting them points of range between 0 and 4, where the maximum value has been granted to the highest scores, apart from the unemployment rate and the amount of students attributed to one

computer, for which the most beneficial values are the lowest ones. Additionally, each of the mentioned indicators has been attributed an importance in the following way (Kuflowski, Przanowski, 2009):

a) the indicator of educational potential – 0.3;
b) the indicator of economic potential – 0.3;
c) the indicator of innovative potential – 0.4.

The potential of e-development of Lower Silesian region has been described by executing desk research, as well as a questionnaire research, that have been commenced in all the counties of the Lower Silesian voivodeship using the CATI method. The range of the desk research has been the following:

1. To calculate the e-development indicator (Wr= 0.3*We + 0.3*Wg + 0.4*Wi)
2. To calculate the educational potential indicator (We=0.4*(e1)+0.35*(e2)+ +0.25*(e3)) on the basis of:
   (e1) – the amount of students attributed to one computer
   (e2) – the percentage of schools having own website
   (e3) – the amount of high school students in relation to the number of inhabitants
3. To calculate the economic potential indicator (Wg=((g1)+(g2)+(g3))/3) on the basis of:
   (g1) – the average monthly salary in PLN per capita
   (g2) – the amount of economic entities registered in REGON per 1,000 inhabitants
   (g3) – the unemployment rate
4. To calculate the innovative potential indicator (Wi=(i1+i2+i3)/3) on the basis of:
   (i1) – the amount of ATMs per 10,000 inhabitants
   (i2) – the percentage of territorial local government units having own website
   (i3) – the amount of enterprises of ICT sector per 10,000 inhabitants.

In order to perform a complex analysis of the Lower Silesian potential of e-development, the desk research has been enriched with questionnaire researches conducted by the author in County Offices and City Halls of Lower Silesian voivodeship. In this way, valuable, often unmeasurable and hardly obtainable information has been possessed, that is difficult to get in other mode. The questionnaire form has been divided on five problem areas, describing the issues connected with the functioning of information society in spatial structures of territorial units. The analysis of the results has contributed to defining the level of awareness among the representatives of local societies in terms of the necessity of realizing the assumptions of the innovative economy development concept, including the ICT sector in particular, an appropriate attitude in terms of implementation of the innovative region policy, indicating the desirable paths of socio-economic development and expected actions aimed at meeting the corporate needs of society.

4. Diagnosis of the Lower Silesia e-development potential

The Lower Silesian voivodeship is characterized by a high level of e-development potential and relatively harmless differentiation of this phenomenon on the scale of counties – in comparison to other Polish voivodeships (see more Miszczak, 2012). Analyses conducted basing on the hereinbefore defined methodical claims have enabled the author to calculate the e-development indicator, in consequence creating the Lower Silesian voivodeship map depicting the e-development level of each of 29 counties lying within its borders (Fig. 1 – Abbreviation "pow." used in this map refers to the term "county").

The highest value has been reached by Wroclaw, Jelenia Gora, Legnica and Lubin counties. To the group of counties of high e-development potential have also been included Zlotoryja county, as well as those localized on the zone of socio-economic activity stretching from the south-west towards north-east, i.e. Walbrzych, Swidnica, Wroclaw, Olawa and Olesnica counties, and the neighbouring from the west and north-west with the Lubin county – Glogow and Polkowice county. These are territorial units that exist in the direct surrounding of the development centres of Lower

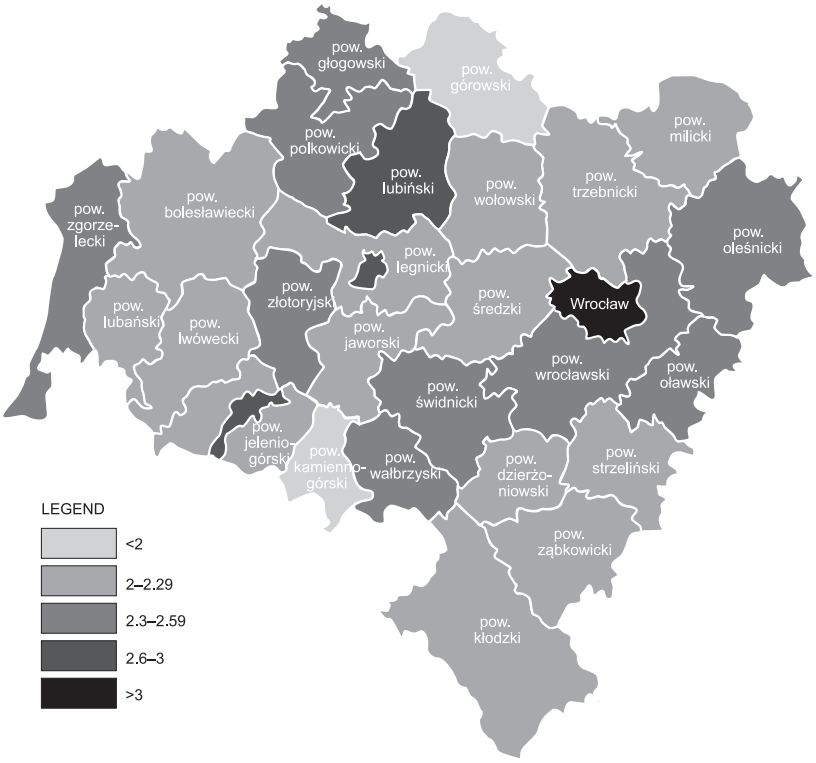

Fig. 1. The e-development of Lower Silesian voivodeship according to counties for the years 2009–2011
Source: Own elaboration.

Silesian region which are Wroclaw, Legnica and Lubin county, which have achieved the highest results in the research. It is an evidence of the influence strength of these potential growth polarities on their closest milieu, and states for a determinant of increasing the socio-economic and spatial cohesion. Over-an-average level of e-development potential of Zgorzelec county which is away from strict zones of influence of Lower Silesian cities can be resulting from benefits coming from the cross-border cooperation with Germany (inter alia the access to German educational system) and Czech Republic (numerous trade contacts of local entrepreneurships with Czech partners), as well as the functioning of large economic entities of fuel-energetic sector, which in turn enables the existence of potential investment capital resources on the territory of the county.

Noteworthy is the fact that definitely a small area, not exceeding the 8% of voivodeship territory is in possession of counties for which the result of the indicator is very low, and yet they are situated on two ends of Lower Silesian voivodeship: southern – Kamienna Gora country and northern – Gora county (Miszczak, 2012, p. 250). In these territorial units it is hard to point out strong sides of e-development potential, if it is possible to talk about e-development in these areas at all. The dominating economic sector of Gora county is agriculture based on small agricultural holdings and the agri-food processing. The significant problem here is the land ownership. On the territory of Kamienna Gora county, Special Economic Zone of Small Entrepreneurship has been created, however it does not collect the entrepreneurships from the modern technologies or services sector, thus not stating for a sufficient magnet for foreign investors.

In the conducted questionnaire research, 55% of all county local government units in Lower Silesia have declared having or planning the realisation of Information Society Development Strategy in their counties. These results are satisfactory only partially, especially when considering the matter of coming up with a question containing the information of planned – if not yet realised – actions towards improving the innovation and support of e-development of local economies. It is further interesting why, when all interviewed local government clerks (apart from the representatives of Zlotoryja county) during the last two years have been taking part in the trainings/seminars regarding the possibilities of implementing the IT solutions in order to improve the effectiveness of the office and local government units' work, they do not actually use the possessed knowledge to construct stable foundations for innovative economy in form of even creating appropriate planning strategic documents. The answer gives an inducement to undertake even more intense and efficient activities in terms of spreading the knowledge about the benefits coming from the effective implementation of innovations within the Lower Silesian voivodeship soon. It is even more significant, taking under consideration the fact that the lack of strategy is not localised, as it might have been guessed, in the sphere of finances because only 6 out of 29 counties have stated that they do not utilize the European Union funds to develop the innovation economy on their territories.

It is further worth to mention that only three (Walbrzych, Zgorzelec and Gora counties) among all the respondents have admitted that during the last year (in relation to the year of commencing the research) no IT investments have been

performed in their territorial units, and also no such actions are planned for the upcoming year. Despite that 79% of county local governments in Lower Silesian voivodeship have mentioned the investment expenses in ICT sector in their budgets of 2010, only two years later, in 2012, only 55% of them have done so (Miszczak, 2012, p. 251).

The results of the questionnaire research from the point of view of strengthening the innovation priority and creativity in managing the units of territorial local government are only partially satisfactory and they lead up to the conclusion that the chances for development of Lower Silesian e-region shall be sought in improving one's own qualifications, in particular among the clerks and the development of modern sector Information and Communication Technologies in local and regional economies.

5. Perspectives of e-development of Lower Silesian voivodeship

The received answers in terms of the questionnaire research, as well the previously commenced desk research allowing to estimating the e-development level of Lower Silesian voivodeship show, according to the author, that positive perspectives of shaping the e-region in this part of south-west Poland are actually existent.

Lower Silesia will be developing even faster. On the one hand it already is and will be connected with the upcoming external investments – direct foreign investments (shaping the automotive cluster within the Lower Silesia). On the other hand, an increase of the regional economic entities activities will take place (*e.g.* Euro Championship 2012, European Capital of Culture Wroclaw 2016), operating on the terms of limiting the investment risk, inter alia thanks to the UE donations or the expansion of market.

The facilitations of conducting own economic entity are also contributing to the situation, as well as creating a new quality of the customer service by public figures, promotion of Wroclaw Functional Area, and hence the whole region, the expansion of tourism and holiday infrastructure, and most of all the reliance of economic processes on the rules of healthy competition and the 'invisible hand of the market'. These conditionings lie in the sphere of interest and possibilities of public sector units.

New investments in new branches and mostly innovation entities will be realised by the native capital. The leader of these undertakings has been and will remain to be: KGHM. The most spectacular is the functioning of the holding capital on the ICT market in form of Netia network. It is sure, though that the spectrum of its activity will keep expanding. Moreover, the sector of small and medium entrepreneurships will still have a significant meaning in investment and innovation processes, putting an emphasis on the medium companies. The latter are considered to be carriers of the technical, technological and organizational advancement.

On the other hand, the predicted decrease of the global amount of the citizens of Poland (including Lower Silesia) will happen at the cost of settlement in countryside and small towns. The ongoing processes of metropolisation will cause the

increase of population, concentration of settlement and economic activities in suburban zones of large cities (Wroclaw, Jelenia Gora, Legnica, Walbrzych, Lubin). The network of medium-sized cities will remain stable, meaning the constantly polycentric character of settlement and providing spatial continuity and permanence of settlement of the territory of the country, including the depopulated regions, as well as specified standards of spatial accessibility of inhabitants to public services. However, the dynamics of the rank increase of the capital of region – Wroclaw, will be bigger in comparison to other Lower Silesian cities, and in the result of intensification of connections with regional networks of metropolitan centres in Europe (in particular in Germany and Czech Republic) Wroclaw metropolitan area will weigh heavily in accordance to the claims of threshold theory of B. Malisz more in the direction of our southern and western neighbours. However, with fulfilling the condition of maximum four-hour mutual accessibility of the centres of main Polish cities, it is possible to form a common investment market in the border of Central Hexagon based on everyday direct economic contacts, and also a significant expansion of the cultural goods and creative industries market range (compare Sleuwaegen, Boiardi, 2014, pp. 1508–1522). It will additionally facilitate the development of metropolitan functions of Wroclaw, functions competitive in relation to the functions played by big cities of other European countries (*e.g.* Prague or Berlin), with simultaneous limitation of internal growth costs (transport, environmental, social), characteristic for intensively developed, multimillion city agglomerations (Miszczak, 2010, p. 77).

Moreover, the author predicts that in the effect of the succession process, and in some cases the mutation one in functional structure of the settlement units localised in the range of Sudety, there will develop places of Spa and holiday functions, offering comfortable conditions of life for the local population. However, in the zones surrounding the big cities of Lower Silesia, functional specialization of smaller towns will take place, where the development of part of them will be connected with fulfilling the residential function. Thus the areas offering the high quality human resources, infrastructures supporting the research and entrepreneurship, reliable transport and telecommunication transport, competent public administration, attractive sphere of leisure services and decent conditions of life (Miszczak, 2010, p. 77) all together will gain in the economic sense.

The presented perspectives of e-development of Lower Silesian voivodeship simultaneously are a form of guidelines for local and regional decision-makers and societies regarding the directions in which the activities in terms of socio-economic development ought to be taking place on their territories, so as these regions deserve for the title of European regions of growth.

6. Conclusions

Basing on the results of the conducted research and undertaken deliberations, it shall be stated that the following entities will have increased chances (resulting from higher resilience) for survival of current and potential socio-economic-political crises:

- Learning themselves, which will put an emphasis on knowledge and development of people (human resources);
- Efficiently implementing the concept of multiband and evaluative management (multi-level governance);
- Connecting the strategy of many areas of management with a main strategy of the entity (intellectual asset of the entity);
- Caring about the trust (trust capital) and communication (relation capital) between the employees and cooperating units in the case of an enterprise, and among the particular stakeholders of regional and local development in the case of units of territorial local government;
- Innovative, changing its profile in order to reduce the costs and find new sources of benefit.

These are the paths of development thanks to which the economic entities will be able to increase their chances for the market success, and the spatial units will be able to expand their competitive advantage in the context of new challenges connected with building the innovative economies of knowledge, and when facing the another slowdown of prosperity. Such entities ought to be encouraged to locate their investments on the territory of the voivodeship, in the same time increasing the changes of such a voivodeship to become a new economic region, which means a region where dissipative structures of network character will form, creating the biggest possibilities to form creative economic structures based on knowledge with simultaneous limitation of conflicts with the existent natural environment. It allows to keep the constant areas of powering the ecologic system of the region, provided that the endogenous factors and natural resources will be involved for the development compliant to the reserve predisposition of the given area and the principles of suspensory development. Such a form of settlement system provides territorial consistency and competitiveness of the Lower Silesian space and the economy in European Union.

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