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SOCIAL DETERMINANTS OF DIGITAL EXCLUSION IN AN AGEING SOCIETY. THE CASE OF POLAND

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Abstract. The aim of the article is to identify and analyze the social determinants of digital exclusion in an ageing society on the example of Poland. The ageing of societies is nowadays a process recognized as a common trend in the world. Demographic changes cause serious socio-economic transformations. Contemporary social and economic systems are dependent on new technologies. Full participation in a technical environment is possible only for individuals with specific technical, social and psychological competences. The ability to use new information and communication technologies becomes a life necessity. In this context questions about the endogenous and exogenous determiants of digital exclusion in ageing societies, as well as about the impact of the digital technology on the emergence of new dimensions of digital exclusion have been raised. The methodological basis of the study are the theories of social and digital exclusion, as well as science and technology studies. The information bases for the study were the GUS (Central Statistical Office in Poland) reports, Eurostat data base and several statistic reports of non-government organizations in Poland. The analyzed period includes 2015-2019 years in cases where the development trends are discusses and 2019 to show the implications of new technologies impact on polish society. The forecasts reach up to 2060. The theoretical study is based on the analytical and semantic method. It has been shown that the analysis of the effects of digital exclusion in an ageing society should cover a much wider range of factors causing negative consequences. Exogenous factors, i.e. barriers preventing Internet use combined with lack of access to new technologies and lack of digital competence should be treated equally to endogenous factors. Motivation to develop and acquire new skills related to individual life strategies of the elderly plays an equally important role in the process of social self-exclusion. Authors also identifies the main dimensions of digital exclusion and presents them as a multi-factor model: Market - trust - economy; Information policy; Marketing - information - knowledge; Electronic democracy; Quality of life - health. The article provides a theoretical framework for the analysis of new dimensions of digital exclusion in ageing societies. It situates the assessment of new technologies in the social context of the progressing demographic changes implications. It points to new categories of social divides in technologically developed societies.

Keywords: ageing society; digital divide; digital exclusion; new technologies; sustainable development

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Additional disciplines: sociology

1. Introduction

There is a general consensus among researchers dealing with the problems of an ageing society that modern demographic processes imply many negative social and economic effects. Transformations of elementary social structures, which seem to undermine the classical assumptions about the natural rights of social development, force us to reflect on the challenges faced by societies in the XXI century (Kozubikova, Kotaskova, 2019; Niemczyk, Trzaska, Borowski, Karolczak, 2019, Korauš, Dobrovič, Polák, Backa, 2019; Borimdesouza, Zanoni, Janchiba, Borinelli, 2019; Ślusarczyk, Tvaronavičienė, Ul Haque, Oláh, 2020; Tvaronaviciene, Burinskas, 2020).

One of the most serious is the widening scope of digital exclusion of the elderly. The mechanism of social exclusion is closely connected with structural analysis - the structural configuration influences: the way knowledge is exchanged, access to material and non-material resources in the society, the possibilities of expansion of social communities, or the probability of stagnation and decline of certain social entities. The most stressed dimensions of social exclusion in contemporary concepts are: economic, political and social ones. The effects of social divides are primarily diverse opportunities for people to participate in social and economic life (Menshikov, Lavrinenko, Sinica, Simakhova, 2017; Korauš, Dobrovič, Rajnoha, Brezina, 2017; Javaria, Masood, Garcia, 2020; Androniceanu et al., 2020). Limited participation in consumption, unemployment, reduction of social contacts, disappearance of elementary social bonds connecting an individual with the social environment, limited participation in public life, inability to define social and economic reality by means of changing meaning systems, and finally loss of ability to recognize and understand market game rules are the most frequently mentioned practical consequences of social stratification.

The set of very well known problems of ageing societies should be accompanied by new issues, such as the question of threats to the practical implementation of sustainable development principles. Developmental disparities are becoming apparent in a situation of increasing the percentage of elderly people (aged 60/65 and over), while reducing the number of young ones. The implications of this situation are the processes that may lead to a demographic disorder of the system. Sustainability development refers to the case when it meets the needs of the present without compromising the ability of future societies to meet their own needs. The unbalanced proportions of society result in the unsustainability of society. From the point of view of the relationship between the implementation of sustainable development objectives and the processes of ageing, apart from life expectancy and health, the way of functioning in society, i.e. the degree of social integration is also important (Adamczyk, 2017; Androniceanu, Tvaronavičienė, 2019). Social enterprises have an important role in social integration as well (Rey-Martí et al. 2020).

The analysis of the notion of old age can refer to many aspects, which results from the very way a person is perceived from the perspective of different areas of his/her life. The central position in the considerations conducted on the basis of various theories is the relationship of an individual to the natural world, the social world, the world of culture, as well as to technological development. The global expansion of new technologies makes them an indispensable element of everyday life, including the elderly. The development of information and communication technologies, Internet of Things, artificial intelligence systems can be one of the most serious factors of social disintegration of the elderly in this context. Many social reports and forecasts also highlight the positive impact of market developments in new technologies on the top-down stimulated inclusion of excluded people in society. In the EU debates, the potential of new technologies in eliminating traditional social divisions is stressed. The works of futurologists and technoenthusiasts have repeatedly referred to the technological theme of the equality society. It is definitely more frequently confirmed that the fast pace of development of the new

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technologies market and the progressing processes of ageing societies will lead to the crystallization of new social divides, whose scale and scope of impact will be incomparable to the known, sociological categories mentioned before.

In these considerations context have been raised important questions: What are the endogenous and exogenous social determiants of digital exclusion in ageing societies? What social challenges are caused by the development of new technologies in ageing societies?

2. Literature Review

The literature on the subject refers to the concepts of digital divide and digital exclusion. The first term was promoted by the American journalist Gary Andrew Poole in 1996 (Pool, 1996). In the 1990s, the issue of access to new technologies was a major interest. Being connected, having a computer or being able to use it at school, in the workplace, etc., was supposed to determine an individual's position in the structure of chances in the labour, educational and business markets (Dutton, Reisdorf, 2019; Androniceanu, 2019). In the literature conceptual divides into information rich and information poor began to appear. The concepts of informational and telecommunications poverty became popular. Digital exclusion is defined as a result of elimination of an individual, a social group from the mainstream of social activity, caused by lack of access and/or inability to use new technologies (Helsper, Van Deursen, 2017). The technological gap between different interactive contexts of social activity, offline and online is the source of the most difficult to overcome developmental disproportions in ageing societies. Sources of digital inequalities are sought at many levels of human activity (Kryszczuk, Green, 2015; Haseeb et al., 2019):
-an unequal access to information and communication technologies and the Internet;
-differences in the quality of used information and communication technologies;
-a speed of adaptation to new technologies;
-an amount and quality of time spent on using the network;
-IT skills and abilities of particular categories of users;
-a degree of adaptability to change and the users' willingness to take risks;
-differences in the knowledge resources needed to skillfully using network resulting directly from the level of education, income, place of residence, age of users;
-an individual differences in the ability to search and evaluate information on the network, degree of network control.

Digital competences could be analysed as the abilities to use information and communication technologies (or more broadly digital). They include skills in operating hardware and software, searching and processing information in different sources. The term therefore refers to IT, information, communication and relational skills in the digital environment (Kačerauskas, 2015). However, there are significant differences in the American and European understanding of this problem. In the United States the phenomenon of digital exclusion is primarily analysed as digital divide - systematic differences in access to and use of computers and the Internet between people of different socio-economic status (education, income, occupation) at different stages of life, sex and different regions. In Europe the term e-inclusion is more popular. The European approach takes into account two extremely important areas of this phenomenon. The first one is the domain of activities that build digital cohesion by delivering the benefits of the Internet and other technologies to all groups of society. The second is based on the recognition that digital exclusion is more than just a digital divide and that it is not only about differences in access, skills or usage, but about all that lead to social and economic exclusion (Betlej, 2017). E-inclusion refers to the effective participation of individuals and communities in all dimensions of the knowledge-based society and economy through access (also understood as removing barriers and facilitating use) and use of information

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and communication technologies (ICT). Moreover, e-inclusion also refers to the extent to which ICTs contribute to equalize and promote participation in different spheres of social life (Wenzel, Kryszczuk, 2019). If we accept the definition of digital exclusion which assumes that the notion of digital exclusion refers to the differences between those who have regular access to digital and information technologies and are able to use it effectively and those who do not (Adamczyk, 2017) and take into account a number of factors that influence the occurrence of this phenomenon, then digital exclusion of elderly people turns out to be a phenomenon conditioned not only by exogenous factors but also by endogenous ones. We can therefore analyse many dimensions of digital exclusion of elderly people. The definitions of digital exclusion become the same way of explicating social exclusion. The rationale for this are similar social, economic and psychological effects of these phenomena. However, e-exclusion seems to cover a wider range of problems, as it is composed of more diverse factors that determine the inclusion of people at risk (Androniceanu A.-M et al, 2020). Not only physical access to the Internet, but also many other psychological and social factors determine individual strategies of new technologies usage (see the Table 1). Complexity marks customers affection excluding buyer's willingness to accept a drain in their attention having impact on digital exclusion as well (Phillips, 2020). Labor integration, particulary in young population in risk of social exclusion, is an important determinant of social divides (Aránega et al. 2020).

Table 1. Social divides in developed societies. Traditional variant

Social divides - traditional variant	
Connection to the network: - access to new technologies, - technical competence, - social competence, - technological education, - The pace of adaptation to changes, - age of users, - individual abilities.	Unconnected to the network: - novelty and type of technology used, - low technical competence, - slow adaptation to changes, - low income, - place of residence, -a number of users, - individual abilities.

Source: Authors, based on Betlej, 2020, p. 235.

The performative potential of individuals seems to be this key factor for future social change. Technological development does not eliminate classical social divides. It rather gives them new content or as a result introduces new principles of social stratification. The role of cultural factors in these processes is increasing. In new concepts of digital exclusion different ways of interpreting human relations with new technologies appear. They include the concept of the connected excluded - the users of new technologies who have the appropriate technical competences but their social competences and knowledge of the challenges and risks of participation in the network is very low (Betlej, 2014; Gondek, 2017), see the Table 2. The problem of new power elites in the network is also being addressed.

Table 2. Excluded connected

Digital exclusion - ambivalent variant	
Excluded connected: -alternative exchange of information resources, - informal cultural circles, - cyberactivity, - alternative network spaces, - individual, - social groups, - social networks, - of society, - naive cyber-consumers.	Elites - Unconnected to the network: - networks of knowledge, - power networks, - classic change actors (e.g. mafia- -oligarchic), - creators of new technologies, - individuals, - new social movements, - arrangements, - the digital fugitives.

Source: Authors, based on Betlej, 2020, p. 235.

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These problems considering the pace of ageing of modern societies in the near future will affect more and more groups of people. However, there are visible divides of societies in the European Union, resulting from the cultural and socio-economic conditions of countries' development (Helsper, Reisdorf, 2017; Mazzanti, Mazzarano, Pronti, Quatrosi, 2020). Radicalization in youth population, as is the case in Bosnia and Hercegovina, also appears to be an important determinant of social exclusion (Oruc, Obradović, 2020).

Nowadays more importance is attached to the development of social competences, cultural adaptation of new technologies to the needs of recipients, sustainable development of the new technologies market, digital inclusion, intelligent technologies used to create a sustainable digital environment to meet social needs and improve the quality of life (Adamczyk, 2017, Bernardi 2019).The ageing of modern societies is an important social, political, economic and business challenge. The effects of social disintegration make it necessary to search for ways to eliminate the adverse implications by introducing changes in the form and quality of e-services (Korczak, 2019). The economy responding to the needs of an ageing society should be defined in terms of an impulse for appropriate direction of development (Betlej, Leśniak- Moczuk, 2017). The change in the structure of the population's needs as well as the increase in their activity should become the sources of progress and sustainable economic growth. These aspects have been presented in many strategic documents in Poland, especially in those that referred directly to the concept of smart, sustainable and inclusive growth. This is indicated by the names of its main priorities: development of an economy based on knowledge and innovation, sustainable development, inclusive development.

3. Ageing society in Poland

The demographic ageing of the population of Europe and some highly developed countries is a global process (Betlej, Leśniak-Moczuk, 2017). It is predicted that this trend will intensify over the next 4 decades and consequently will lead to significant changes in the proportions between the elderly and the young. As demographers emphasize, Poland is one of the countries where this change will be particularly severe. According to forecasts from one of the youngest countries of the European Union, it will become one of the oldest in 2060. According to the forecasts, Poland is the country in which the increase in the share of the elderly will be the fastest among all the European Union countries (Jedlińska, 2018). According to the projections, by 2050 there will be significant changes in the population size and demographic structure. In 2019 the population of Poland was over 37 887 771 people and is expected to decrease in 30 years by nearly 4 million people.

In 2050, it is estimated to be about 33 950 000 people. From the point of view of demographic changes, it is also important to note that there will be a decline of over 23 percentage points in the working age population. Interestingly, the population of mobile working age is projected to decrease while the number of people of non-mobile working age will increase. The ageing of the population results in many consequences for the implementation of sustainable development objectives in Poland (shrinking labour resources, increasing number of inactive people). In 2050 the number of seniors in the so-called fourth age will increase among nearly 40% of people aged 60 and more, as illustrates the Graph 1 below.

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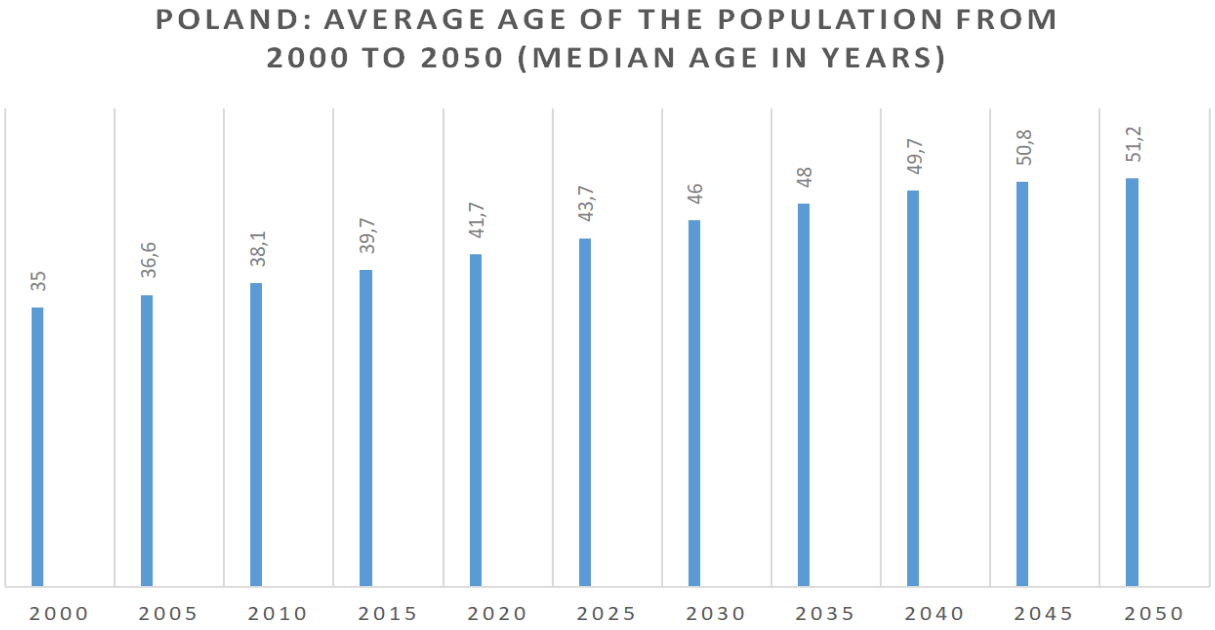

Graph 1. Poland: Average age of the population from 2000 to 2050 (median age in years).
Source: Authors, based on: Eurostat data base
https://ec.europa.eu/eurostat/statisticsexplained/index.php/Digital_economy_and_digital_society_statistics_at_regional

The aforementioned double ageing will be based on a faster than general rate of growth of the percentage of population aged 80 and over.In cities the projected number of people aged 80+ will be 2 143 087, 9 which will already constitute 6.3% of the Polish population. In the countryside, in 2050 the number of people in this age group will be 1 394 411, or 4.1% of the population. The elderly will therefore constitute a very numerous and important group of recipients of new technical solutions (Gacka, 2017). In the context of the discussion on the challenges of social integration in a sustainable society, that commonly uses new technologies in everyday life, the problem of e-services becomes an important issue. Elderly people seem to be an overlooked group of recipients by enterprises and public administration implementing new forms of mobile services. The expansion of e-services market brings new challenges for sustainable social participation of all age categories of recipients.

In 2019, 78.3% of people aged 16-74 used the Internet at least once a week in Poland. In 2018 in the European Union this percentage was 83%. Poland's distance to the EU average remained at 8 percentage points. In 2019 in Poland 97.3% of those who have used the Internet in the last 3 months used it regularly. The percentage of people who connected to the Internet every day or almost every day was 84.8%, and 2.7% using the Internet less frequently than once a week.

Taking into account the type of professional activity in 2019 the highest percentage of regular users was among schoolchildren and students (99.6%), the self-employed (95.5%) and the lowest among retired and other inactive persons (48.3%). The share of regular Internet users increased in all age groups. In 2019, compared to 2018, the largest increase in the share of regular Internet users occurred in the group of people aged 55-64 by 9.5 percentage points (see Table 3 below).

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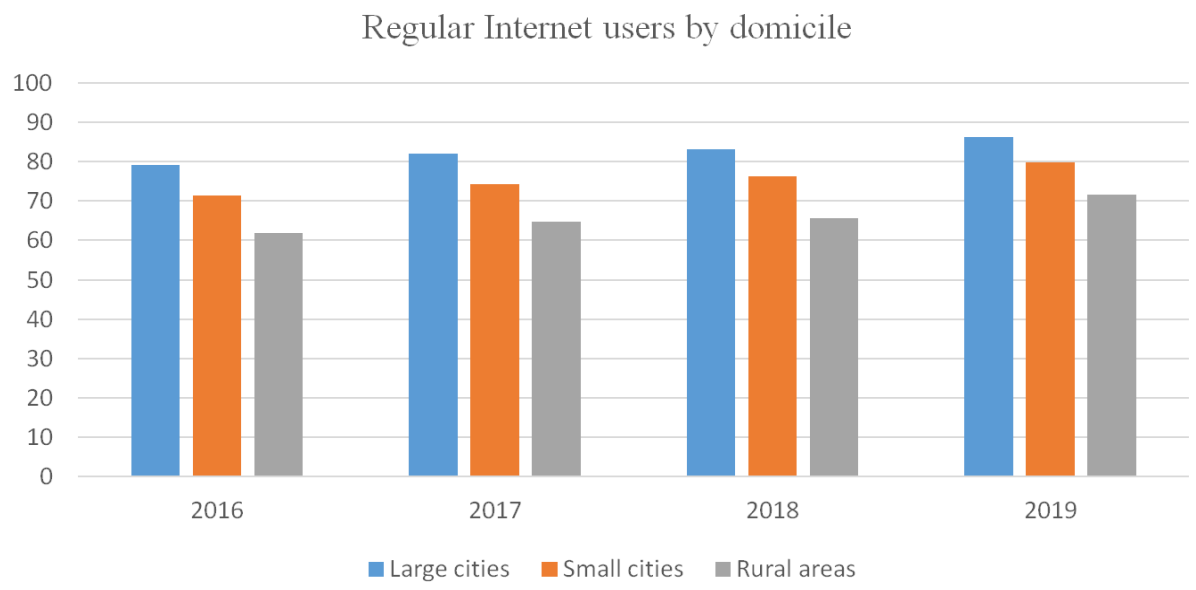
Table 3. Regular Internet users by age groups

Specification	2015	2016	2017	2018	2019
	Regular Internet users by age groups in % of total individuals in a group				
16–24 years	97,1	97,7	99,0	98,8	99,3
25–34 years	91,3	92,3	94,5	96,5	97,0
35–44 years	79,6	84,1	87,5	90,6	94,5
45–54 years	61,2	62,9	67,7	73,4	78,1
55–64 years	41,5	45,4	47,5	50,4	59,9
65–74 years	19,5	23,1	26,0	29,8	33,3

Source: Authors, based on GUS data base (GUS, 2019: 185)
http://stat.gov.pl/en/topics/science-and-technology/science-and-technology

The most common reason for no Internet access at home was the lack of need to use it (68%). A smartphone is becoming a much more popular tool for using the Internet. The research shows that elderly people in Poland have low digital competences (Garwol, 2020, pp. 47-68). In the 45-54 age group the share of people with low digital competences oscillates around 39%. Similar situation is observed among 55-65 aged where 31.2% people also have such low IT skills. The highest percentage of people using the Internet on a regular basis was recorded among inhabitants of large cities, while the lowest percentage was in rural areas. In recent years this indicator has been increasing regardless of the place of residence. In the last five years the highest increase in the percentage of people using the Internet regularly was observed in rural areas (by 15.5 percentage points), see Graph 2.



Graph 2. Regular Internet users by domicile in Poland
Source: Authors, based on: Eurostat data base
https://ec.europa.eu/eurostat/statisticsexplained/index.php/Digital_economy_and_digital_society_statistics_at_regional

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Among people with higher education there is the highest share of people using the Internet regularly (in 2019 - 97.5%). In the group of people with primary or secondary education, this indicator remains at the lowest level, despite the fact that over the last five years it has increased by 13.6 percentage points.

Among Poles aged 55-64 there are 40% of Internet users, and only 11% in the group of 65 years and more. Only 16% of pensioners are network users (Garwol, 2020, pp. 47-68). In terms of Internet use by elderly people, Poland ranks last in the European Union.The spatial diversity of rural and urban municipalities in terms of the number of Internet users is also visible. The main reasons for this phenomenon can be seen in the differences in access to ICT infrastructure and the Internet, the wealth of the municipalities, the level of education of the inhabitants (Adamczyk, 2016, pp.5-13).The size of the place of residence has a large impact on the degree of computer and Internet use. This indicator also influences the way computers are used. 47% of inhabitants of the largest cities use computers primarily for work. The smaller the town, the more often the computer is used for entertainment.

In examining the level of e-exclusion in Poland, the Central Statistical Office adopted four basic indicators - total e-exclusion (persons aged 16 and over who have never personally used a computer); - e-exclusion to a significant extent (persons aged 16 and over who have personally used a computer but are not Internet users); - e-exclusion to a moderate degree (persons aged 16 and over who have personally used a computer and the Internet, but the scope of this use was relatively small); - e-exclusion to a limited extent (persons aged 16 and over who have used the Internet at work and elsewhere, but not at home). According to the GUS and Eurostat data, the phenomenon of digital exclusion mainly concerns the elderly, pensioners, disabled people, farmers and residents of rural areas, as well as poorly educated people. The main dimension of digital exclusion in Poland is age.

4. Discussion

The phenomenon of digital exclusion of elderly people in Poland is very often addressed in public documents as well as in scientific works. It is confirmed that elderly people do not use the Internet as often as young or very young people. However, we are dealing here with a cultural phenomenon. When writing about digital exclusion of elderly people, it should be remembered that this social group is characterized by the high degree of inhomogeneity (Adamczyk, 2016). A very important factor influencing the attitude to new technologies, including remote-controlled services, is the fact at what stage of old age the individual is. The process of human ageing is a sum of changes taking place in three fundamental spheres of human life: biological, psychological and social. The change within one of these spheres entails changes in the other two, but the process of ageing does not affect individuals in the same way.

Ageing is not a homogeneous process, there is a fundamental difference in health, intellectual and physical fitness between people aged 60-75 and the group of people aged 75-85 and the oldest, i.e. over 85 (Gonzales, Ems, Suri, 2016). For conscious and effective use of modern technologies, the so called third (60-75 years old) and fourth age (75-85 years old) is important. This results from changes in the human body, the need to provide care and support especially in old age. It is connected with deepening symptoms of physiological and mental ageing: gradual reduction of psychophysical fitness and independence, reduction of the possibility of social adaptation - so-called social ageing, intensification of dependence on others. The age between 60 and 75 (the so-called third age) is a period characterized by much greater activity, independence and efficiency than the fourth age (75-85), in which dependency on others and the need for care appear much more often (Adamczyk, 2017). In the fourth age, the incidence of various somatic and mental illnesses increases significantly. The risk of dementia with its' rich and at the same time burdensome symptomatology is growing (Adamczyk, 2017, pp.66-77)). Therefore, it should be remembered that seniors do not constitute a homogeneous group (Wenzel, Kryszczuk, 2019) and there is a difference of one generation between people aged 60 and 80, although they all fall into the category of seniors. As a consequence, there is also a significant difference in health and fitness, and thus in the

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area of needs and activity (Wachowicz, Kossecki, 2012). We can therefore consider many dimensions of digital exclusion.

The basic issue in the case study of digital exclusion is the motivation to use new technologies. It is the motivation to buy a computer, a network connection and to acquire the necessary skills to use the right applications. Another issue is an access to computers and the Internet at home, at work, at school or in any other place, as access does not have to mean the real use (especially if there is no motivation). According to GUS data, 22.2 million people in Poland in 2019 used a computer (1.6% more than a year ago and 12.5% more than in 2015), 21.3 million of whom used it regularly (2.5% more than the previous year). In 2019. 78.3% of people aged 16-74 used the Internet regularly (GUS, 2019: 25). However, according to the analyses contained in the report, there are differences in Internet use depending on age, economic activity, level of education and place of residence.

The highest percentage of regular users was recorded among pupils and students (99.6%), self-employed (95.5%), people with higher education (97.5%), and residents of large cities (86.3%). In central Poland the share of regular Internet users was higher than in other parts of the country (GUS, 2019: 25). Are we dealing here only with exogenous factors that make it impossible to use the Internet or on the contrary with endogenous factors related for example to motivation? In order to identify endo and exogenous barriers to the use of new technologies, different attitudes towards them must be traced (Gitlow, L. 2014, pp. 271–280). In the literature there could be found references to four levels of access to new media:
-motivation to use new technologies,
-physical access (computer ownership, Internet access),
-skills (strategic, informational, operational),
-usage (different ways of using) (van Dijk, 2006).

If we look at these attitudes, it turns out that in the case of older people there is the necessity to deal with other attitudes resulting not necessarily from a physical lack of a computer or a problem with access to the Internet, but with weakening skills and weakening motivation. This state of affairs seems to be confirmed by the Central Statistical Office (GUS) data from the report "Information Society in Poland" in which the most common reason for no Internet access at home given by households is lack of such need and in 2019 it amounted to 67.6%. Only the second most frequently mentioned reason for no Internet access at home was the lack of appropriate skills - 52.0%.

In recent years the percentage of households with no Internet claiming the Internet aversion as the reason has been increasing. The high access costs are not pointed at the main factors of the exlusion (GUS, 2019: 152). Of course, if we analyze the data of the Internet use, it turns out that younger people are the main new technologies users. In the context of the conducted deliberations, the new problem has emerged. How to deal with the process of self-exclusion progressing along with moving to the next older age groups? This is confirmed by data from the above mentioned GUS report. Comparing for example the level of Internet shopping in 2019 in two age groups: 55-64 and 65-74, it turns out that 27.3% of people from the younger group in general made such purchases and only 13.2% of the older ones (GUS, 2019: 176). Even greater differences can be observed in more advanced new technologies use, as illustrates the Table 4 below.

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Table 4. Persons who performed selected software activities in the last 12 months in 2019

Data in %	Total	Age 55-64	Age 65-74
Copying or moving a file or folder	51,3	26,8	12,7
Use of word processors	39,2	18,9	8,6
Creating presentations or documents combining text, images, tables, charts	23,6	7,9	3,1
Use of spreadsheets	27,9	12,2	5,3
Using advanced spreadsheet functions	13	4,6	1,4
Using photo, video or audio editing software	25,6	4,5	0

Source: Authors, based on GUS data (GUS, 2019: 185)
http://stat.gov.pl/en/topics/science-and-technology/science-and-technology

Data from the Central Statistical Office or Eurostat clearly indicate a close relationship between age and access to the global network and the level of Internet skills. However in-depth research allows us to learn about older people's behaviour on the new technology market from a different perspective. The subjectively perceived usefulness of new technologies, their degree of adaptation to the lifestyle of an elderly person, as well as the influence of the nearest environment and self- image shaping (based on identity) are also very important. The new technologies market in the senior citizens' segment does not differ much from other market segments in this respect. It is internally differentiated. The age criterion is one but not the only distinguishing feature of the market.

We can also consider e-services in a broader problem context as important elements in information society, knowledge society or network society development. These are new forms of service delivery through new technologies, reflecting the global social changes brought about by technological development. The digital transformations of modern countries have a micro-scale effect on the change of certain business models, the way of communication and democratic processes. In public administration we have been observing a tendency to increase the share of e-services in relation to traditional services. In Poland the importance of introducing standards of e-services in terms of their simplicity of use (ease and intuitiveness), originality, personalization, mobility, openness, socialization is emphasized. The social effects of digital exclusion in ageing societies seem to broaden the range of individual problems of excluded people. However the effects of technological changes not adapted to social needs seem to reach much further and concern the entire economy (Helsper; Van Deursen, 2017). The effects of digital exclusion cause many negative phenomena, among which could be mentioned for example unsustainable economic development. Participation in social life, civic activity, access to health care requires the ability to use new digital tools (Adamczyk, 2016).

Conclusions

Age is only one of the possible categories of social determinants taken into account in analyses of the causes of digital exclusion. People can be threatened with digital exclusion both 45+ and 60+. New technologies can be applied in everyday life practice of older people at several levels of their activity referring to pre-defined levels of digital exclusion. Advanced information and communication technologies, especially social technologies, should be adapted to the special needs of older people, among which they should be mentioned:
-a possibility of contacting medical and social assistance by means of special applications,
-a possibility to use system solutions (detailed instructions for specific situations) dedicated to activities related to bank accounts, electronic offices, electronic services commonly available on the market,

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-a possibility of supporting social activation, maintaining ties with family, friends, other social media user groups can help eliminate the feeling of alienation, exclusion, lack of contact with other people on a daily basis.
Modern developed societies are constituted by such factors as: universal access to computers, ability to use them effectively, developed and relatively common knowledge of information and communication technologies. A very important factor is also the positive assessment of these factors by conscious and not accidental users. Technology has never before been as human friendly as it is today. Technological novelties such as new phones and computers are becoming easier to use for the elderly. The tools are more and more adapted to the needs of the recipients, however, due to the growing reluctance towards technological innovations older people often exclude themselves from society. What are the reasons for this situation? The answers can be sought by analyzing the dimensions of digital exclusion of older people:
Market - trust - economy: The digital exclusion of older people is very often due to a lack of trust in new services such as e-banking. Despite the ability to use technical tools (phone, computer), many people do not want to adapt to the changing economic environment (Wachowicz; Kossecki, 2012). There are many reasons for this, including concerns about the lack of privacy and security of online transactions. On a national scale, the losses to the economy associated with the expansion of this area of exclusion are very high. The financial aspects of digital exclusion and its importance for the further development of a sustainable economy are less and less frequently discussed today. This is an extremely important problem area.
Marketing - information - knowledge: Digital exclusion resulting from a lack of knowledge and competence makes older people a category of people who are particularly exposed to the techniques of marketing propaganda. The thoughtless treatment of information appearing on the Internet, as well as information transmitted through new technologies, exposes elderly people to material, psychological and social losses.
Information policy: A separate range of new quality services creates another area of contemporary digital exclusion of older people - limited access to public services: electronic offices, electronic libraries, e-footprint, virtual deans.
Electronic Democracy: A consequence of and at the same time an area of digital exclusion are also limited rights of elderly people to key civic information, as well as a reduced scope of political exercise and civil rights.
Quality of life - health: New technologies, such as cell phones, are becoming tools in the fight for the health and life of the elderly. Health monitoring applications, fast localization, robotization of medical services, electronic tools supporting the work of human organs are only selected examples of solutions for improving the quality of life in the ageing European societies. Lack of willingness to use these solutions by elderly people, despite their knowledge and technical competence, may constitute another area and factor of digital exclusion.

How to design solutions that can be dedicated to many age categories of people? The key to understanding the problem is to know the essence of the needs of digitally excluded people. It seems reasonable to say that the defined new areas of digital exclusion of older people will be a great challenge for social economy entities in the near future. The most effective programs in the fight against digital divides will be those dedicated to shaping attitudes and motivation of older people, which will be able to effectively counteract emotional, psychological and motivational barriers through group education - through experience and interaction. Socio-economic changes related to the progressive process of ageing of modern societies require a new approach to the use of digital technologies and innovative actions. Technology assessment should become a key factor of the assistance system for elderly people. The needs of activation and social integration of the excluded or threatened by digital exclusion require in-depth research. A quantitative analytical approach prevails in statistical studies. Digital exclusion is analysed through a global set of similar factors which do not always take cultural differences into account. This is well illustrated by the example of Poland. Older people are not a homogenous social category. The analysis of social trends shows that in the future, smart cities will be the main service functions for the population. The inclusion of rural areas in regional smart networks is also being discussed. New technologies will therefore be easily accessible. Another issue that needs discussion is the assessment of digital and social competences. Younger recipients of new technologies also become excluded if one considers new threats, such

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as dependence on electronic gadgets, inability to evaluate the e-information, vulnerability to marketing and propaganda messages and, finally, inability to use increasingly advanced mobile devices. Technological progress seems to be ahead of social development. Therefore, the assessment of internal determinants of social exclusion in ageing societies should include an analysis of changes in older people's lifestyles and their expectations of technological devices. The main problem still seems to be the lack of knowledge about the social potential of new technologies.

References

Adamczyk, M. 2016. Education in late adulthood as a form of social participation of older people, in: Mensikovs V. (ed. by) Proceedings of the International Scientific Conferences of Faculty of Social Sciences of Daugavpils University. The materials of the International Scientific Conference, Daugavpils Universites Akademiskais apgads "Saule", Daugavpils: 5–13.

Adamczyk, M. 2017. Active and Healthy Aging as an Element of Social Integration of Older dults, in: Kinal, J.; Guz, (eds. by) W. Społeczne aspekty zdrowia: wybrane zagadnienia. (Social aspects of health: selected issues), Rzeszów: Stowarzyszenie Naukowe Przestrzeń Społeczna i Środowisko: 66–77.

Androniceanu, A.-M., Georgescu, I., Tvaronavičienė, M., Androniceanu 2020. A. Canonical Correlation Analysis and a New Composite Index on Digitalization and Labor Force in the Context of the Industrial Revolution 4.0., Sustainability 12 (6812).

Androniceanu, A., Tvaronavičienė, M. 2019. Developing a holistic system for social assistance services based on effective and sustainable partnerships. Administratie si Management Public, 33: 103-118. https://doi.org/10.24818/amp/2019.33-06

Androniceanu, A. 2019. Social responsibility, an essential strategic option for a sustainable development in the field of bio-economy, Amfiteatru Economic, 21(52): 347-364. In EN: pp.503-519

Androniceanu, A., Kinnunen, J., Georgescu, I. 2020. E-Government clusters in the EU based on the Gaussian Mixture Models. Administratie si Management Public, 35: 6-20. https://doi.org/10.24818/amp/2020.35-01

Aránega, A.Y., Sánchez, R.C., & Pérez, C.G. (2020). Labour integration of young people at risk of social exclusion through the development of key competencies. Economic Research-Ekonomska Istraživanja. https://doi.org/10.1080/1331677X.2020.1836991

Bernardi, A. 2019. The capability approach and organizational climate as tools to study occupational health and safety. Insights into Regional Development, 1(2), 155-169. https://doi.org/10.9770/ird.2019.1.2(6)

Betlej, A. 2020. Społeczeństwo sieciowe- potencjały zmian i ambiwalentne efekty. (Translated by authors: Network society - potential for change and ambivalent effects), Wydawnictwo KUL. = KUL Publishing House.

Betlej, A. 2014. Non-knowledge, Risk and Technology in Networked World- Towards the Future, Transformacje (Transformations) 3-4 (82-83), 2-17.

Betlej, A. 2017. Peril and Promise of Internet Technology for Future Social Order. In: Zacher, L. W. (ed. by). Technology, Society and Sustainability. Selected Concepts, Issues and Cases. Springer: 117-128.

Betlej, A.; Leśniak-Moczuk, K. 2017. Technology and an aging population in Network Society. Towards Virtually-based Communities. Roczniki Nauk Społecznych Vol. 9(45), Issue 2: 61-72.

Borimdesouza, R.; Zanoni, B. L.; Janchiba, J. H.; Borinelli, B. (2019). Organizations and sustainability: a field of knowledge. Management of Environmental Quality: An International Journal, 31(2), 365-384.
https://www.emerald.com/insight/content/doi/10.1108/MEQ-09-2019-0203/full/html

Dutton, W.H.; Reisdorf, B.C. 2019. Cultural divides and digital inequalities: attitudes shaping Internet and social media divides. Information, Communication & Society 22(1): 18–38.

Eurostat. https://ec.europa.eu/eurostat/statisticsexplained/index.php/Digital_economy_and_digital_society_statistics_at_regional_level

Gacka, J. 2017. Polscy seniorzy w sieci: wirtualna złota jesień? Korzystanie przez osoby dojrzałe z internetu i nowych technologii. (Translated by authors: Polish seniors online: a virtual golden autumn? Using the Internet and new technologies by mature people). Konteksty społeczne, = Social Contexts, 5-1(9): 84-91.

Garwol, K. 2020. Stopień umiejętności korzystania z technologii cyfrowych a wykluczenie społeczne na przykładzie osób niepełnosprawnych, starszych i ubogich. (Degree of digital literacy and social exclusion, with the example of disabled, elderly and poor people). Nierówności Społeczne a Wzrost Gospodarczy (Social inequalities and economic growth), 58, 47-68.

Gitlow, L. 2014. Technology use by older adults and barriers to using technology. Physical & Occupational Therapy in Geriatrics 32(3): 271–280.

Gondek, J. 2017. Sign- Technology- Simulation. Reflections on the Project of Jean Baudrillard's Research Method. Transformacje (Transformations), Vol. 3-4 (94-95): 87-98.

Gonzales, A.L.; Ems, L.; Suri, V.R. 2016. Cell phone disconnection disrupts access to healthcare and health resources: a technology maintenance perspective. New Media & Society 18(8): 1422–1438.

GUS, Information society in Poland Results of statistical surveys in the years 2015–2019. http://stat.gov.pl/en/topics/science-and-technology/science-and-technology

Haseeb, M., Hussai, H. I., Kot, S., Androniceanu, A., Jermsittiparsert, K. 2019. Role of Social and Technological Challenges in Achieving a Sustainable Competitive Advantage and Sustainable Business Performance. *Sustainability*, 11(14), Article Number: 3811

Helsper, E.J.; Reisdorf, B.C. 2017. The emergence of a "digital underclass" in Great Britain and Sweden: changing reasons for digital exclusion. New Media & Society 19(8): 1253–1270.

Helsper, E.J.; Van Deursen, A.J.A.M. 2017. Do the rich get digitally richer? Quantity and quality of support for digital engagement. Information, Communication & Society, 20(5): 700–714.

Javaria, K.; Masood, O.; Garcia, F. 2020. Strategies to manage the risks faced by consumers in developing e-commerce. Insights into Regional Development, 2(4): 774-783. http://doi.org/10.9770/IRD.2020.2.4(4)

Jedlińska, R. 2018. Wykluczenie cyfrowe w Polsce na tle krajów Unii Europejskiej. (Digital exclusion in Poland in comparison with European Union countries). Ekonomiczne Problemy Usług (Economic Problems of Serrvices), 131(2/2): 225-236.

Kačerauskas, T. 2015. Technologies in creative economy and creative society, Technological and Economic Development of Economy, 21(6): 855-868.

Kozubikova, L.; Kotaskova, A. (2019). The Impact of Technological Factors on the Quality of the Business Environment. Transformations in Business & Economics, Vol. 18, No 1 (46): 95-108.

Kryszczuk, M., D.; Green, B. E. 2015. Digital Divide in Poland: An Exploration of Some Sociological Impacts of Personal Computer Possession, Internet Use and PC Proficiency. Central European Management Journal, 23(3): 2-19. https://doi.org/10.7206/mba.ce.2084-3356.147

Korauš, A.; Dobrovič, J.; Rajnoha, R.; Brezina, I. 2017. The safety risks related to bank cards and cyber attacks, Journal of Security and Sustainability Issues 6(4): 563-574. https://doi.org/10.9770/jssi.2017.6.4(3)

Korauš, A.; Dobrovič, J.; Polák, J.; Backa, S. 2019. Security aspects: protection of people in connection with the use of personal identification numbers. Journal of Security and Sustainability Issues, 8(3): 319-330. https://doi.org/10.9770/jssi.2019.8.3(3)

Korczak, K. 2019. Wykluczenie cyfrowe w ochronie zdrowia z perspektywy pacjentów oraz personelu medycznego. (Translated by authors: Digital exclusion in healthcare from the perspective of patients and health professionals). Polityka Społeczna (Social Polictic), 8 (545): 24-29.

Mazzanti, M.; Mazzarano, M.; Pronti, A.; Quatrosi, M. 2020. Fiscal policies, public investments and wellbeing: mapping the evolution of the EU. Insights into Regional Development, 2(4): 725-749. http://doi.org/10.9770/IRD.2020.2.4(1)

Menshikov, V.; Lavrinenko, O.; Sinica, L.; Simakhova, A. 2017. Network capital phenomenon and its posibilities under the influence of development of information and communication technologies. Journal of Security and Sustainability Issues 6(4): 585-604. https://doi.org/10.9770/jssi.2017.6.4.(5)

Niemczyk, J.; Trzaska, R.; Borowski, K.; Karolczak, P. (2019). Scalability 4.0 as economic rent in Industry 4.0. Transformations in Business & Economics, 18, No 2B (47B), 824-838.

Oruc, N.; Obradović, N. (2020). Drivers of radicalisation of youth in Bosnia and Herzegovina. Economic Research-Ekonomska Istraživanja, 33(1): 2559-2573. https://doi.org/10.1080/1331677X.2020.1772094

Phillips, F. (2020). Does complexity belong inside the firm, or out?, Economic Research-Ekonomska Istraživanja, 33(1): 2397-2409, https://doi.org/10.1080/1331677X.2019.1625796

Poole, G. A. 1996. A new gulf in American education, the digital divide. The New York Times, January 29, 1996.

Rey-Martí, A., Díaz-Foncea, M., & Alguacil-Marí, P. (2020). The determinants of social sustainability in work integration social enterprises: the effect of entrepreneurship, Economic Research-Ekonomska Istraživanja, https://doi.org/10.1080/1331677X.2020.1805348

Ślusarczyk, B.; Tvaronavičienė, M.; Ul Haque, A.; Oláh, J. 2020. Predictors of Industry 4.0 technologies affecting logistic enterprises' performance: international perspective from economic lens. Technological and Economic Development of Economy, 26(6): 1263-1283. https://doi.org/10.3846/tede.2020.13376

Tvaronaviciene, M.; Burinskas, A. 2020. Industry 4.0 significance to competition and the EU competition policy: A literature review. Economics and Sociology, 13(3), 244-258. https://doi.org/10.14254/2071-789X.2020/13-3/15

Wachowicz, J.; Kossecki, P. 2012. Zaufanie starszych użytkowników Internetu na tle zagrożenia wykluczeniem cyfrowym. (Trust of older Internet users in the risk of exclusion). Handel Wewnętrzny (Internal Trade), tom 3: 266-276.

Wenzel, M.; Kryszczuk, M. 2019. Od przypadkowości do bezradności. Aktywność poznawcza internautów w sprawach publicznych. (From randomness to helplessness. Cognitive activity of internet users in public matter). Kultura i Społeczeństwo (Culture and Society), 63(3): 203-224. https://doi.org/10.35757/KiS.2019.63.3.10

Van Dijk, J. 2006. The network society (2nd edition), Sage Publica- tions, London.

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