

**THE INFORMATION SOCIETY IN POLAND –
THE INDIVIDUALS' APPROACH**

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ABSTRACT

An information society as a sociological concept developed in the 1960s by economists Fritz Machlup and Tadao Umesco as a substitute for an economic counterpart known as the knowledge-based economy. The information society is based on creation, distribution, diffusion, usage, integration and manipulation of information which are significant for a social life and economic, political, as well as cultural activities. Specific to this kind of society is a crucial position information and communication technologies (ICT) have for digital communication skills, exchange of information, education, professional careers and business, and recently including politics. In other words, ICT is a tool that has been engendering new ways of living and working together. Therefore, it is worth to examine whether the Polish individuals (households) are ready enough to benefit from socioeconomic growth brought by the usage of ICT in order to alter life and work styles. The subject of the empirical analysis is a percentage of individuals possessing presumed digital skills, self-assessment of them against a background of the European Union's inhabitants (EU-27), as well as the ways of digital capabilities' development. Presented study bases on the hypothesis that the Polish households (individuals) have been making efforts to transform irreversibly their manners of living in virtual reality. Analyzing and concluding are based on the Polish Central Statistical Office reports (GUS) and Eurostat over 2005¹ – 2008.

Keywords: *The Information Society, Information and Communication Technologies (ICT), Individuals, Digital Communication Capabilities (Digital Competencies)*

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¹ 2005 was the first year of gathering the statistical data referring to computers using, internet access and ICT usage in Poland by the Polish Central Statistical Office.

INTRODUCTION

The Polish government is totally aware of the importance of the information society, so having in mind its positive consequences for improving the living conditions of citizens, has been striving to enable the dynamic development of ICT through passing suitable resolutions and reports in which the vision of the information society has been formulated. According to the term adopted by the governmental official documents "information society" is defined as "[...] a society for which the processing of information with the use of ICT solutions creates significant economic, social, and cultural value" (The Strategy, 2008). The Strategy takes into account the priorities of the European information society policy that result from the assumptions of the Lisbon Strategy and the initiatives.

Regardless the concept of the modern society there are two of the central issues, i.e. what kind of society the given nation represents and which role ICT plays in the contemporary society. Taking four theoretical milestones into consideration:

- F. Machlup's (1962) notion of knowledge industry (five sectors: education, research and development, mass media, information technologies, information services),
- P. Drucker's (1969) distinguishing between economy based on material goods and based on knowledge,
- D. Bell's (1976) focusing on the number of employees producing services and information as an indicator for the information character of the society,
- and eventually M. Porat's (1977) distinction between a primary sector (information goods and services directly used in the production, distribution or processing information) and a secondary sector (information services produced for internal consumption by government and non-information enterprises),

the OECD (OECD, 1981) has worked out the definition for calculating the share of the information economy in the total economy. According to the above ideas and formulated indicators, in particular the Porat's index of the total value added by the primary and secondary information sectors to the gross national product (GNP), the information society has been defined as a society where more than half of the GNP is produced and more than half of the employees are active in the information economy.

Neither a real sphere of economy nor a financial one cover thoroughly the essence of the information society, however enterprises, corporations, banks, public administration etc. as various kinds of organizations are the overwhelming topics of scientific disputes considering the knowledge-based economy or the information society. Persons playing their roles as

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consumers, employees, employers, investors, and so on appear in the society and in the market in the capacity of household members whose computer and internet literacy belongs to factors laying foundations of the information society. Therefore, it is worth to conduct researches dealing with individuals' (households') advance in ICT usage to improve their style of life and work.

In order to realize the scientific objective of this empirical article i.e. the evaluation of the Polish individuals' readiness to be included into the European (global) information society, three perspectives have been taken into consideration: types of digital communication capabilities, self-assessment of the digital competencies, methods of skills' development, surveyed against a background of EU-27 countries. Similarly to OECD's definition of the information society the key tool applied to findings is so called inflection point (50-percentage share of individuals as the threshold meeting the requirements of the information society of the given descriptor), that determines a mass criterion to achieve maturity due to ICT implementation. The presented statistical data have been compiled on the basis of generalized results of representative surveys on the ICT usage conducted in the EU according to the harmonized methodology. Data on households cover households (excluding collective housing) with at least one person aged 16-74 and persons from this age living in these households.

POLAND VS THE EU-27 IN ASPECT OF COMPUTERS AND THE INTERNET USAGE

Assuming that ICT is a set of activities that facilitate by electronic means the processing, transmission and display of information (Estavillo, 2004), it is apparent that possessing the computer and the internet access is a *sine qua non* condition to begin taking advantage of the information society, and digital communication skills are necessary to complete performance in a global "village".

Supposing the significant impact of a professional activity on individual's motivation to use both the computer and the internet in everyday life it should be presumed as a descriptor of ICT usage by persons aged 16-74.

Taking five professional activities (including pensioners and professionally passive persons), rising tendencies could be observed as regards all groups using computers regularly (at least once a week), although the dynamics was different. Obviously, students and pupils tend to use computers most frequently (nearly entire population of learning persons in 2008), the percentage share of self-employed persons almost doubled within two last years (84.4% in 2008 vs. 44% in 2007) in spite of the

economic slowdown. The percentage share of employees using computers regularly grew by roughly 16 percentage points over four years, whereas the percentage share of unemployed persons increased by nearly 18 percentage points. However, the rate of change of the latter group is dissatisfactory since the percentage share is far below the inflection point typical for the mature information society. The share of pensioners and professionally passive persons in using computers was less than one fifth in 2008, and changed only by 10 percentage points over the examined years. The mass criterion of the information society's attribute was achieved by students and employees at the earliest, then by self-employed individuals (2008). Neither the group of unemployed persons, nor pensioners and professionally passive people attained the presumed threshold, though percentage shares of both have been augmenting.

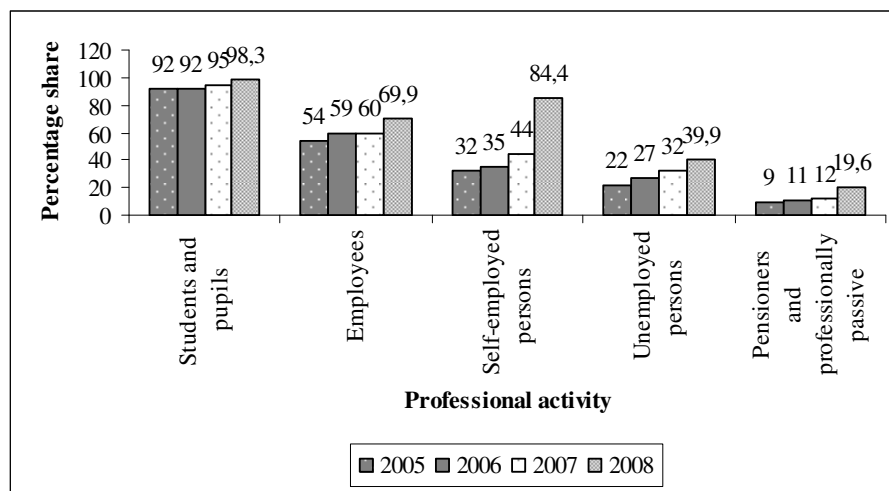


Figure 1: Persons Aged 16-74 Using Computers Regularly According to the Professional Activity

Source: Own compilation based on The Polish Central Statistical Office reports (2006, 2007, 2008, 2009)

Similar relationships have been noted with reference to the internet usage taking the same division into consideration, pointing out however, lower percentage shares of internet users than persons using computers in each group of professional activity. The differences in percentage points share between computer and internet users were not equal (the least amid student -roughly 6 percentage points in 2008, then pensioners and professionally passive persons -slightly over 7 percentage points, self-

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employed – about 10 percentage points, employees – nearly 14 percentage points, and the highest, i.e. slightly over 15 percentage points concerned group of unemployed persons, respectively), because they reflected motivations to the internet access of various strength relating to each professional activity.

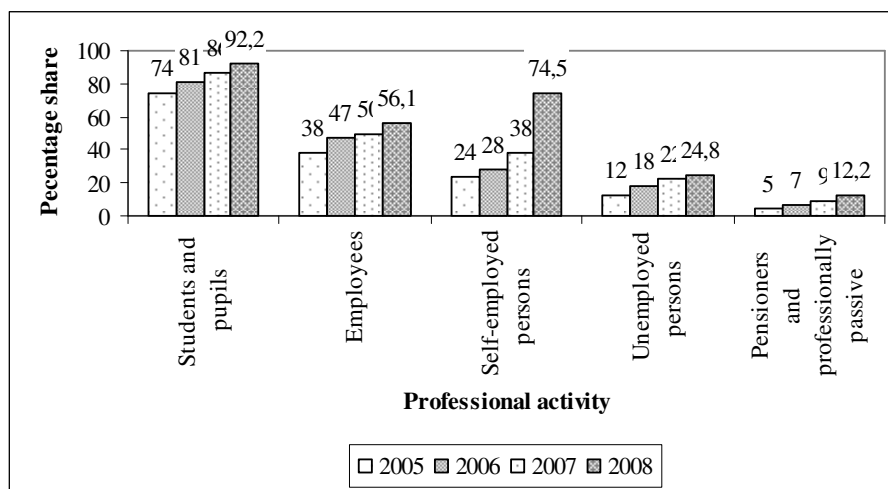


Figure 2: Persons Aged 16-74 Using Internet Regularly According to the Professional Activity

Source: Own compilation based on The Polish Central Statistical Office reports (2006, 2007, 2008, 2009)

The most spectacular rate of growth, i.e. over 50-percentage points was observed among self-employed individuals between 2005 – 2008, and almost double increase over last two years, although the internet usage was most popular with students and pupils, and the percentage share of internet users in this group increased by over 18 percentage points over 2005-2008. Similar rate of growth (18,1 percentage points) was characteristic for in a job people, as well. Diametrically opposed to above described groups were ranked unemployed persons (one fourth percentage share of internet users amidst these individuals), and pensioners with professionally passive people (a percentage share of internet users equalled slightly over one tenth in 2008). Consequently, internet practising considered as an attribute of the information society, students and pupils attained its maturity level at the earliest, employees in 2007, self-employed persons in 2008, and by analogy two others remained far below the inflection point.

Summing up, polar opposites are mentioned, i.e. professionally active individuals who keep pace with technological progress and professionally passive people who might become socio-excluded because of failure to follow ICT development.

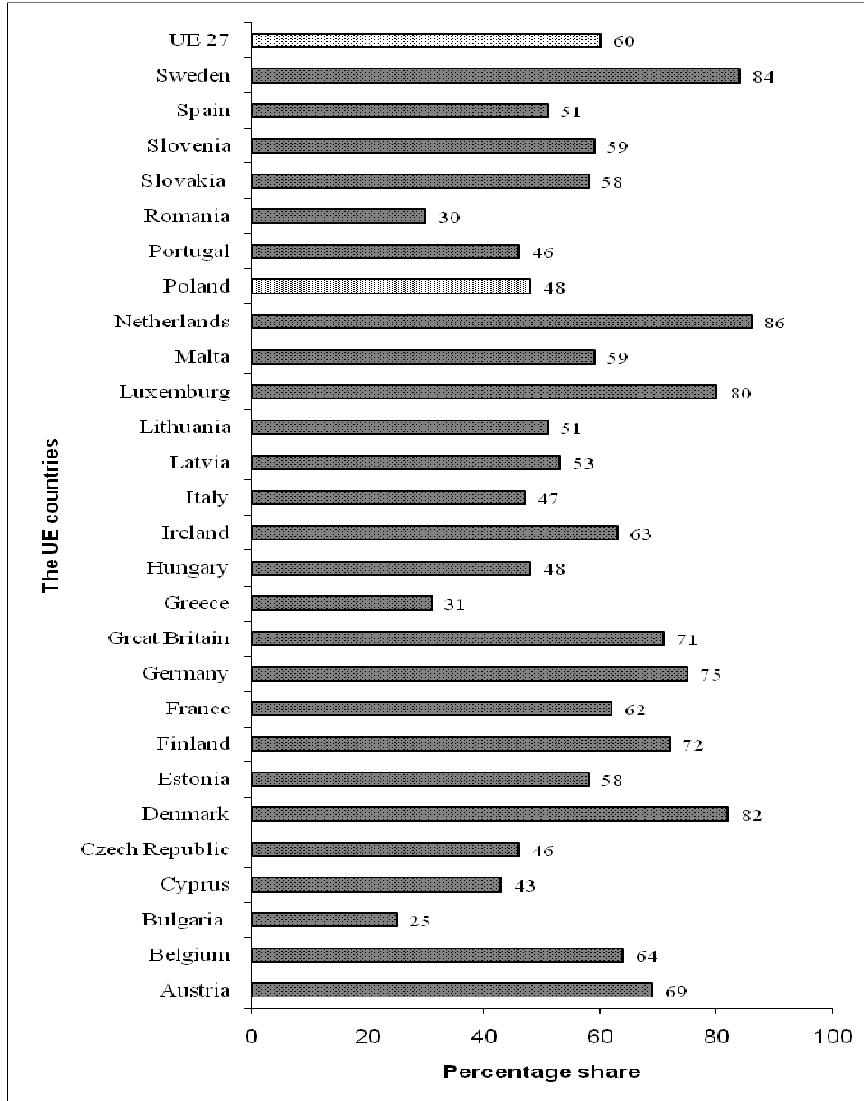


Figure 3: Persons Using Internet Regularly in the UE-27 in 2008

Source: Eurostat

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The EU-27 has attained on average the maturity level as the information society (54% in 2007, and 60% in 2008), however the percentage share of persons using internet regularly in the most advanced countries (the Netherlands) was over threefold higher at variance with the percentage share of the most technologically backward one (Bulgaria). Poland was ranked twentieth (39% in 2007 vs. 48% in 2008), much below the average percentage, but slightly below the maturity level. There were four old EU members (Spain, Italy, Greece and Portugal) and all of new ones below the average level, but six of them attained the inflection point. Poland's rank was a consequence of a low percentage share of internet users coming from the groups of unemployed persons and people professionally passive whose motivation to virtually oriented transformation of their lives is rather faint.

TYPES OF DIGITAL COMMUNICATION CAPABILITIES

A study of digital communication capabilities is based on the assumption that if a person declares having done a given activity using a computer or the internet even once, he or she will be able to do it in the future, so the person has acquired needed digital skills.

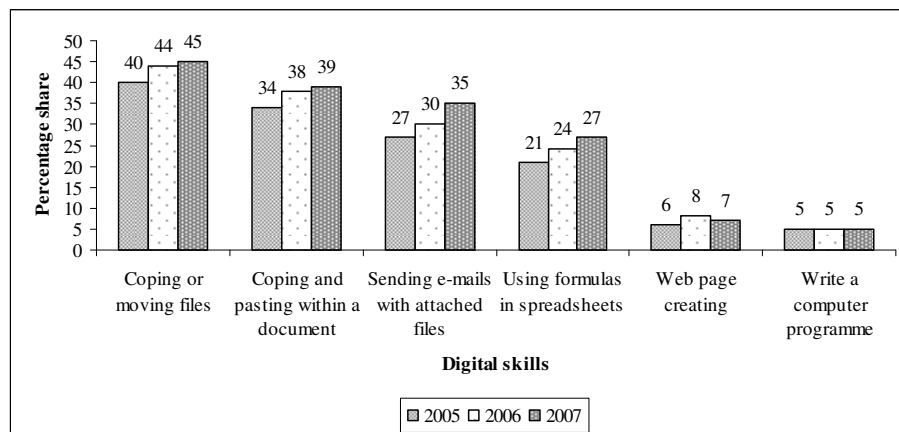


Figure 4: Types of Digital Communication Capabilities among Persons Aged 16-74

Source: The Polish Central Statistical Office Report, 2008

Considering both types of digital capabilities – i.e. simple skills like coping or moving files or folders, coping and pasting to duplicate or move information within a document, sending/receiving e-mails, and more

advanced, e.g. usage of basic arithmetic formulas in a spreadsheet, creating a web page or writing a computer programme using a specialised programming language – a relationship between increasing percentage share of the internet users and rising percentage share of individuals' digital skills, in particular of the simple type, could be observed. Despite a quite fast augment of all capabilities, but programming (still 5-percentage share of persons) neither attained a maturity level. Merely a percentage of persons being capable of coping or moving files was approaching the maturity threshold (45% of computer users declared this skill). The highest rate of growth of basic digital skills was noted as concerns sending e-mails with attached files (increase by 8 percentage points between 2005 and 2007), and the lowest rate as relates to coping or moving files (5 percentage points, respectively). Using arithmetic formulas in spreadsheets was of the highest augment of advanced digital capabilities (increase by 6 percentage points over three years), and the percentage share of individuals being capable to write programmes using a specialised language kept fixed (5% of population aged 16-74).

Sending e-mails with attached files is an extremely useful capability not only for professionally active people so one can forecast the attaining the maturity level in the nearest future. Applying formulas in spreadsheets, in turn, might play as a skill a comparable role amidst professionally active people, so its percentage share may go up quickly.

Taking digital capabilities with reference to computers usage the average percentage share of persons being capable of the selected skills in the EU exceeded the inflection point merely as regards coping or moving files (56%) as well as coping and pasting documents (54%), i.e. the basic and the most useful capabilities. Other percentage shares positioned below mass criterion meaningfully (39% -using arithmetic formulas in spreadsheets, 30% -compressing files, 9% -writing programmes using a specialised programming language). It is worth to mention that there were significant variances between the most advanced countries and the technologically backward ones, however none of the former attained the information society maturity taking all selected capabilities into consideration. Merely Luxemburg attained maturity level of the information society in relation to four digital skills (73% -coping/moving files, 70% -coping and pasting documents, 54% - using formulas in spreadsheets, 56% -compressing files), Austria, Denmark and Germany achieved the inflection point as considers three digital skills (coping files – 70%, 74%, 69% share; coping and pasting – 68%, 71%, 68%; using formulas in spreadsheets – 52%, 60%, 51%, respectively).

The percentage share in none of the EU-27 countries exceeded one fifth of individuals being capable to write programme using a specialised

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programming language (the most advanced in this respect was Luxemburg – 18%, and otherwise Bulgaria and Romania – 3%).

Table 1: Digital Capabilities Connected with a Computer Using in the UE-27 in 2007

Countries	Coping/ moving files	Coping and pasting	Using formulas in spreadsheets	Compressing files	Writing programmes in a specialised language
Percentage share of persons aged 16-74					
Austria	70	69	52	44	12
Belgium	52	53	40	31	8
Bulgaria	30	27	18	19	3
Cyprus	46	43	32	25	7
Czech R.	53	49	33	29	5
Denmark	74	71	60	41	14
Estonia	49	48	43	34	10
Finland	64	62	47	35	19
France	59	58	43	35	13
Great Britain	65	63	47	31	11
Greece	40	39	25	22	7
Germany	69	68	51	34	10
Hungary	54	54	46	33	9
Ireland	52	48	35	25	6
Italy	42	42	29	26	7
Lithuania	48	46	35	30	5
Luxemburg	73	70	54	56	18
Latvia	51	47	35	25	5
Malta	43	44	32	24	6
Netherlands	76	74	49	43	13
Poland	45	39	27	18	5
Portugal	46	43	35	29	7
Romania	27	23	10	13	3
Slovakia	63	58	46	27	5
Slovenia	59	54	47	35	8
Spain	55	54	38	39	11
Sweden	70	70	49	36	11
UE-27	56	54	39	30	9

Source: Eurostat; The Polish Central Statistical Office Report, 2008

In comparison with the EU-27 digital capabilities the Polish individuals' digital capabilities were below the average level. The percentage shares of the latter reflected the former's relations, i.e. the diminishing percentage shares of persons, taking the presented capabilities in turn. The greatest

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difference between the EU-27 and Poland related to coping and pasting documents (15 percentage points), the smallest referred to writing programmes (4 percentage points).

Table 2: Digital Capabilities Connected with the Internet Using in the UE-27 in 2007

Countries	Using search engine	Sending e-mails with attached files	Using of chat sites, on line discussion forums	Phoning by internet	Web page creating
Percentage share of persons aged 16-74					
Austria	68	58	22	17	12
Belgium	66	59	21	12	8
Bulgaria	32	27	20	16	4
Cyprus	37	29	8	9	5
Czech R.	50	49	18	17	9
Denmark	80	72	33	25	18
Estonia	61	59	43	28	18
Finland	79	65	27	22	17
France	59	55	25	29	14
Great Britain	59	62	17	10	10
Greece	36	26	11	6	5
Germany	73	60	28	14	10
Hungary	54	48	27	13	9
Ireland	55	47	12	8	6
Italy	41	38	25	13	9
Lithuania	50	40	25	25	6
Luxemburg	75	70	37	26	16
Latvia	58	48	34	21	7
Malta	45	41	20	8	8
Netherlands	83	75	26	25	16
Poland	48	35	23	15	7
Portugal	42	37	24	11	7
Romania	23	21	12	5	4
Slovakia	62	55	21	16	9
Slovenia	58	49	24	12	12
Spain	55	45	29	9	9
Sweden	76	64	19	12	13
UE-27	57	50	24	15	10

Source: The Polish Central Statistical Office Report, 2008

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The EU-27 accomplished mass criterion of the information society considering the percentage share of persons having skills to benefit from using the search engines (57% on average) and sending e-mails with attached files or folders (50%). Even in the most technologically advanced countries only these capabilities were widespread. None of the other skills regarding percentage shares of persons being digital capable reached one fourth of the population. With reference to basic (search engine usage, sending e-mails with attachments, use the internet to make telephone calls) and more advanced (use of chat sites, web page creating) digital capabilities necessary to the internet usage Poland's rank against a background of the EU-27 was similar to the previous analysis, i.e. below the average level. However, the variances between the percentage shares of internet users referring the given digital capabilities were lower as compared with the computer literacy. In particular, the greatest difference (25 percentage points) concerned sending e-mails with attached files or folders, then using search engines (9 percentage points), web page creating (3 percentage points), use of chat sites (a percentage point). Percentage share of persons making telephone calls by internet in Poland and in the EU-27 was equal.

Concluding, Poland belongs to less technologically advanced countries in the EU-27, but taking the dynamics of acquiring of the most popular and useful digital capabilities into consideration (e.g. using search engines) there is a chance to reach maturity levels of information society in the nearest future.

SELF-ASSESSMENT OF THE DIGITAL COMMUNICATION COMPETENCIES

The analysis of self-assessment has been done in aspect of having sufficient or insufficient digital capabilities with reference to labour market needs. The survey concerned the question whether the respondents' digital competencies were sufficient enough to find or change job within a following year (GUS, 2008). The remarkable was that about 40% of the EU inhabitants had assessed their computer and internet literacy as irrelevant in their current professional situation (pensioners or not willing to change the job). In consequence, inhabitants of the countries described as the most mature information societies were convinced mostly about their digital communication competencies (Denmark, Luxemburg, Sweden and Finland - nearly two thirds of respondents). On the contrary -the least certain were inhabitants in Bulgaria, Portugal and Latvia (much over the half of relevant population). As regards Poland and its inhabitants the self-evaluation did not differ essentially from the average characteristic for EU's. Admittedly, the percentage share of persons described their digital competencies as sufficient

was lower than the average one, and that of insufficient higher than average, but the variances were slight (2 percentage points advantage considering the answer sufficient and 3 percentage points less regarding the answer insufficient).

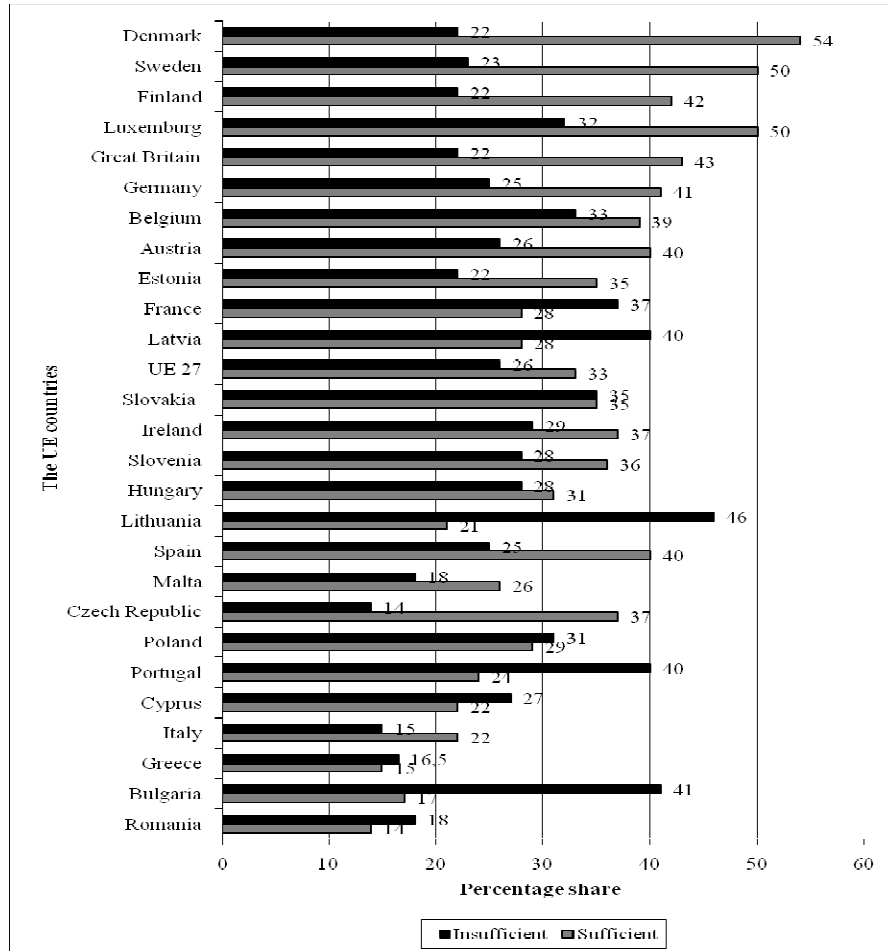


Figure 5: Self-Evaluation of Digital Communication Capabilities In The UE in 2007

Source: Eurostat

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METHODS OF DIGITAL COMPETENCIES' DEVELOPMENT

Having technical infrastructure (computers and communication devices) solved by saturating the households (individuals) with it, progress in other areas is necessary, in particular motivation to develop digital communication competencies. The knowledge-based economy increases the demand for highly qualified labour, which involves investing in people (education) that results in development of both individuals and societies. From economic point of view, the very same person, playing a multifold role in the economy and society, defines the productivity and efficiency on the one hand, and influences social behaviour, organization and progress on the other. Therefore, the key skill is a computer and internet literacy and it should become an important component of every system of education.

Statistical data prove that the Poles acquired and broadened digital competencies with the use of various methods depending on their age, mostly. The most popular were two methods, i.e. introduced to the economic terminology by Arrow as "learning by doing", and with help of their relatives or acquaintances (more or less one third of population as concerns both methods). Worth mentioned is the fact that especially persons aged 45-64 acquired their computer literacy with the use of the latter method. Young people (students and pupils) tend to learn digital communication in schools, colleges and universities (one fourth of population). More or less one sixth of population used manuals and electronic instructions. Only 7% of individuals benefited from courses recommended by their employers, and 5% from courses on their own initiative. What is interesting – the frequency of using given methods did not change significantly over the examined period.

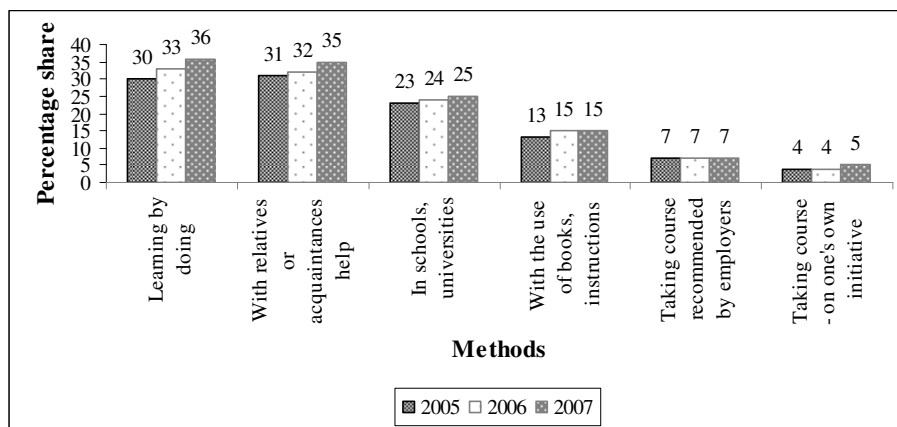


Figure 6: Methods of Digital Competencies' Development

Source: The Polish Central Statistical Office Report, 2008

Table 3: Methods of Digital Competencies' Development in the EU-27

Countries	Learning by doing	With relatives or acquaintances help	In schools, universities	With the use of books, instructions	Taking course recommended by employers	Taking course on one's own
Percentage share of persons aged 16-74						
Austria	60	53	23	25	24	16
Belgium	47	36	19	20	10	10
Bulgaria	24	20	9	14	5	5
Cyprus	38	34	19	25	12	12
Czech R.	33	42	23	22	14	7
Denmark	78	69	29	26	24	12
Estonia	63	57	47	30	9	10
Finland	56	47	28	27	17	9
France	64	62	39	23	17	8
Great Br.	45	35	15	25	18	10
Greece	33	24	8	17	6	12
Germany	64	72	36	27	32	15
Hungary	42	35	34	27	12	13
Ireland	26	18	11	24	6	15
Italy	38	32	23	14	10	11
Lithuania	23	40	25	28	6	7
Luxemb.	66	60	27	27	22	15
Latvia	39	33	9	29	7	9
Malta	37	28	14	19	5	18
Netherln.	72	62	19	16	18	8
Poland	36	35	15	25	7	5
Portugal	45	45	25	22	11	10
Romania	19	15	10	13	2	2
Slovakia	54	58	30	27	14	10
Slovenia	53	51	29	28	14	12
Spain	53	46	22	20	15	18
Sweden	80	74	48	32	42	17
UE-27	50	47	25	22	17	11

Source: The Polish Central Statistical Office Report, 2008

The EU-27 inhabitants developed their computer literacy similarly, taking their favourable methods, however the average percentage share was higher than in Poland apart from learning in schools method (colleges) or universities (a scholarship index in Poland that equals far over 50% belongs to the highest indices not only in the EU). The numbers tend to reproduce Poland's ranking regarding possessing both computers and the internet access by households (individuals) against a background of the entire EU. A majority of the EU-27 population acquires a computer and internet literacy as well as broadens digital competencies benefiting from learning by doing and

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with their relatives and acquaintances help, a minority from courses taking on one's own initiative, however there were 12 countries whose percentage share of persons using the latter method exceeded the average level, and in 5 of them (Greece, Spain, Ireland, Malta, Hungary) even exceeded the percentage share of employees improving their digital competencies in the courses taken on their employers' initiatives.

Summing up, the study indicates that inhabitants of the European community are making efforts to improve their computer and internet literacy but getting a quicken pace may depend on transformation in the economic, social and political environment.

CONCLUSION

A mechanism of the information society development needs a strategic involvement that combines technical resources (computers and telecommunications), human resources (e.g. employees and consumers), law, business environment and information resources (software and information). An improvement in any of these areas separately brings positive results quickly. However, long run progress is not possible until limitations in other areas are removed. Therefore, a harmonious and coordinated development of all areas in question is decisive for a smooth transition into the information society (UNDP, 2002).

The EU-27 an average readiness to benefit from the information society is dissatisfied as a whole since the community achieved the maturity level with reference to the indispensable attributes.

There is a relationship between the level of ICT access and the conviction of individual's digital competencies in the separate EU countries, i.e. the more common ICT access in the country, the higher self-assessment of its inhabitants.

Despite the rapid progress in the computer and internet literacy the Polish individuals were ranked below the EU-27 level because of the apparent dissection according to the professional activity. Motivation lapse accompanying aging, professionally passive persons may become a major psychological brake on a way towards the information society.

Transformation of virtual behaviour was the most spectacular among self-employed group of professional activity, in particular over two last years what might have been caused by the worsening economic standing of plenty of enterprises, climbing rate of unemployment, resulted in the necessity of seeking the ways to get rid of risk to be excluded from a socio-economic growth.

The advancement of the Polish information society in the nearest future depends on the rate of overcoming the economic slowdown, mostly

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since the individuals turned out to be extremely enterprising and highly motivated, in particular people aged 16-40, to change their style of work and life. Not waiting for governmental or European supporting system they applied own recourses to develop their digital capabilities. Emerging economies have plenty of priorities so there is always lack of funds to finance activities being of private and public significance. Therefore, the Polish government under the pressure of initiatives taken by the EU's Parliament and Commission was obliged to implement documents dealing with the expansion of the information society, e.g. "The Strategy for the Development of the Information Society until 2013" (2008) and the report "Poland 2030" (Raport Polska, 2010). The main disadvantage of them is a complete lack of instruments conducive to put the proper objectives into practice what might block or at least slow down indispensable progress of the information society in Poland.

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