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USE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN GORA AREA

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***Abstract*—**Information and communication technologies offer the possibility of a wide multidisciplinary and multisectoral implementation of technology through creative and innovative activity. It is impossible to imagine modern and advanced technology without the support of knowledge, thus it is necessary to increase the number of experts who will be trained in the field of ICT and will impact to digital literacy and digital enhancing awareness among the population of Gora. To improve information security in all forms ICT application is one of the preconditions for the creation of a sustainable information society. ICT development is very rapid and its impact on all spheres of life and changes in the world economy have created more demanding environmental conditions in which we live and do business, forced the necessity of the application and development of information and communication technologies. A large number of individuals is on the wrong side of the digital divide and is not digitally literate to take advantages of ICT, no matter that huge amount of money is invested in infrastructure development and improvement of system. Professional staff is essential at all levels in order to create information literate society.

***Keywords*—**information and communication technologies (ICT), computer, information society.

I. INTRODUCTION

INFORMATION and communication technologies with their development and use have transformed the modern society into „information society“. The most important role in the production and economy and in all spheres in the lives of individuals and society in general, are certainly information and communication technologies.

The importance of these technologies is recognized by all worldwide, and this year for the first time, a group of researches conducted a study on the use of information and communication technologies in Gora. Gora is a municipal unit comprising eighteen villages and a town (small town) Dragaš.

The research was conducted in the period of time from 01 April 2013 to 15 April 2013. The applied type of research was: phone interview, direct or via the Internet (Skype, MSN). The sample size was 200 households, where the number of samples is same with the individuals.

The response rate was 100 %. The same pattern that was used for the households was also used for the survey of people aged 16 to 74 years, individuals who live in the territory of Gora. The response percentage is the same as for the households [2-5, 10, 13].

For households, the target population consists of all with at this one member aged between 16 and 74 years of age.

The type of the sample is a two-phased, stratified sample by size and activity.

The research consisted of a group of questions categorized by modules:

- Module A: Access to information and communication technologies,
- Module B: Use of computers,
- Module C: Use of the Internet,
- Module D: Use of Public Administration,
- Module E: Shopping via Internet,
- Module F: E-skills,
- Module G: General information on examinee.

In 2011, the research was conducted by EUROSTAT regarding the use of information and communication technologies in the households and by individuals, where the data of 27 countries of the European Union were included, including Croatia, Iceland, Norway, Macedonia and Turkey.

The research was conducted by a model of the National Bureau of Statistics, which is regularly conducted on the territory of Serbia. Individuals and households were asked questions used in 2010 and 2012. And, all this is in line with EUROSTAT and the principles of the European Union, so we'll make a comparative analysis with the results of the mentioned Office also with the rest of the countries in the region [7, 12].

The publication is intended to provide users with sufficient information about the current situation in the field of information and communication technologies in Gora area, and will serve as a good basis for planning its future development and development in general of this

sub-region.

II. ICT AS AN ANSWER TO THE MODERN SOCIETY

IT is one of the names which is used for information technologies and in English language it represents an *Information Technology*, and ICT is another name which represents information and communication technologies, and in English stands as *Information and Communication Technology*. Information technologies have emerged from electronics applying knowledge of physics and mathematics. Information technology (IT) is a concept describing parts (hardware equipment) and programmes (software) that allows us to access, download, organize, manipulate and present information electronically. Communication technology (CT) is a concept used to describe telecommunications equipment through which we can send, receive and request information.

The modern world is facing with increasingly frequent periods of economic instability and negative rates of growth. Today, economic theory provides the central role to the growth driver, productivity and innovation, respectively the information and communication technologies and the Internet. Investments in ICT are often called smart investments that enable:

- Creation and retention of jobs and the positive trend of creating new jobs, contemporary technologies and stable economic growth,
- Creation of the basis for sustainable economic growth in the future.

McKinsey Institute estimates that at the global level the growth of GDP of 3,40 % will be experienced in developed countries that achieve 70 % of world GDP, and that achievement will be contributed by the Internet. In the developed part of the world, The Internet contributes to the growth with 21 % of GDP. And, according to data of the EU, ICT sector realizes 5 % of European GDP and contributes to overall productivity growth in Europe by 50 % [7, 12].

One of the most striking global consequences of the revolution of information and communication technologies (ICT) is certainly the development of electronic commerce (e-commerce), respectively the activities of buying and selling of products and services that are carried out via the Internet or other channels of electronic communication. Today, there is virtually no country that has no access to the Internet, and that it does not have any sort of e-commerce, while Europe, with Asia and North America, leads in this trading segment [11]. However, when one looks at the representation of e-commerce in individual European countries, we will observe that the data between countries vary widely.

At the current rate of multiplication of knowledge and discovery, the total sum of the knowledge which will be disposed by humanity will be 4 times greater from a moment when a child which is born finishes a college. When that child should be 50, the total sum of knowledge will be increased by 62 times, and 97 percent of the knowledge will be revealed after his birth [10].

More information has been collected for the last 30 years than in the previous 500 years. Interestingly, the Sunday edition of the New York Times publish more information than a man who lived in the sixteenth century, compiled a lifetime. Total of human knowledge in the period between 1900-1950 was doubled, and since then, doubling every 5-8 years.

The obsolescence period of information in ICT is six months, and the amount of information that today appears in a single day is greater than the total amount of information from the creation of the world until the Middle Ages [5-6].

The information of society in the countries of Europe is based on the initiatives of the EU agenda, so that the countries of the Western Balkans have brought their national strategies with the aim of determining the priorities and guidelines for the development of the information society (table 1). Priorities defined in these strategies relate to the following areas [1, 2-4, 11]:

- Electronic communications,
- e-administration, e-health, e-justice,
- ICT in education, science and culture,
- e-commerce,
- business center of ICT,
- information security.

Table 1: National strategy of the Western Balkans' states [1, 6, 11]

Countries	Strategies
Serbia	Development strategy of informat. society in R.of Serbia until 2020
B and H	Development strategy of informat. society of B-H from 2004 to 2010
Croatia	Programme of e-Croatia from 2009 to 2011
Montenegro	Development strategy of informat. society 2009-2013
B and H/ Rep. of Serbian	Development strategy of informat. society RS from 2008 to 2013
Macedonia	Development strategy of informat. society

III. THE RESULTS OF RESEARCH AND COMPARATIVE ANALYSIS

As we mentioned in 2011, EUROSTAT has conducted research on the use of the information and communication technologies in households and by individuals, as well as in the companies, having examined all countries of the EU and many countries of our region and beyond. So there are some results in order to compare what are the conditions of ICT regarding to households and individuals in Gora area.

Based on the research of the National Bureau of Statistics implemented in 2012 by the methodology of EUROSTAT an analysis is carried out on the use of the Internet in the management of the companies. Research on the use of information and communication technologies in the company is on the representative sample of 1.200 companies, with the rate of response 89 % or 1067 companies. Companies on the territory of the Republic of Serbia use computers in their business. The percentage of computer usage is 98,10 %, which is increased by 0,30 % compared to 2010. The use of computers is lowest in small enterprises and amounts to 98 %, and in medium-sized and large enterprises amounts to 100 %. The use of computers in enterprises varies depending on the territory entirety: in Belgrade it is 99,30 %, in Vojvodina 98,40 %, and in Central Serbia 96,50 %. In 31,90 % of the companies, a quarter of employees use computer at least once a week, while in 35,70 % of the companies 75 – 100 % of employees use computer at least once a week [12].

The use of information and communication technologies in households was conducted in Gora area on a representative sample of 200 households, and the response rate was 100 %. The same pattern is used for the survey of people aged 16 to 74.

In table 2 the number of households is presented by settlements including the level of education, employment status and number of members by households with a separated number of a child younger than 16 years.

Table 2: Households and individuals in Gora area

Settlement	Number of households	Income (€)			Level of education			Employment status			No. of members	
		To 300	300-600	More than 600	Primary	Secondary	Higher and Superior	Employed	Unemployed	Students and others	Total	Younger than 16
Baćka	1	1	0	0	0	1	0	1	0	0	3	0
Brod	14	9	3	1	1	8	4	10	2	2	51	24
Dikance	7	5	1	1	0	5	2	5	2	0	23	8
Donja Rapča	6	3	2	1	1	3	2	4	1	1	19	11
Donji Krstec	5	1	4	1	1	1	3	4	1	0	18	10
Dragaš	24	12	7	5	2	5	17	20	1	1	74	37
Globočica	23	8	12	3	2	8	13	21	0	1	72	42
Gornja Rapča	7	3	3	1	1	4	2	5	1	1	26	16
Gornji Krstec	5	4	1	0	2	2	1	3	2	0	18	8
Kruševo	22	12	9	1	5	10	7	15	4	3	79	29
Kukaljane	7	5	1	1	3	2	2	3	3	1	14	8
Leštane	6	6	0	0	3	2	1	2	3	1	12	5
Ljubovište	8	5	2	1	5	2	1	4	3	1	19	11
Mlike	2	2	0	0	1	1	0	1	1	0	5	0
Orćuša	3	3	0	0	3	0	0	0	3	0	9	4
Radeša	10	9	1	0	6	2	1	3	5	2	24	10
Restelica	28	20	4	4	15	9	4	10	15	3	92	47
Vranište	10	5	2	3	2	2	6	8	1	1	34	13
Zli Potok	10	10	0	0	8	1	1	2	8	0	40	17

In Gora area, the use of TV by households is 88,89 %, where the households possess one TV including the percentage of 61,11 %, with two TV is 22,22 %, with three TV is 5,56 %, while without TV is 11,11 %. Cable TV possess 61,11 % of households (Table 3 and Figure 1).

Table 3: Appliances used in households

Appliances	The used percentage (%)
TV	88,89
Mobile phone	100,00
Cable TV	61,11
Laptop	44,44
Computer	88,89

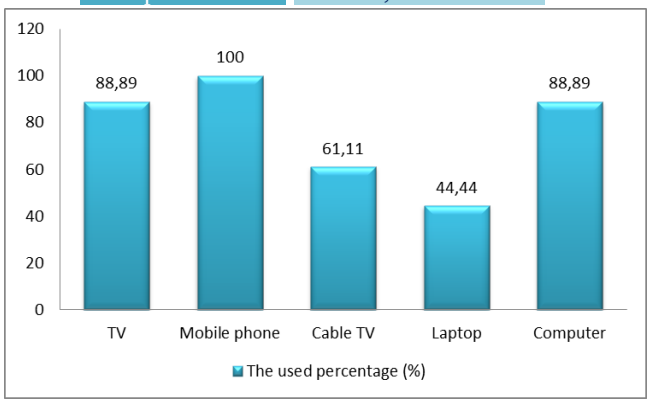

Figure 1: Appliances used in households

The percentage of households possessing computers according to monthly income is presented in Table 4 and Figure 2.

Table 4: The percentage of possessing computers by the income of the households

Monthly income of households (€)	The used percentage (%)
To 300	16,67
From 300 to 600	74,07
More than 600	9,26

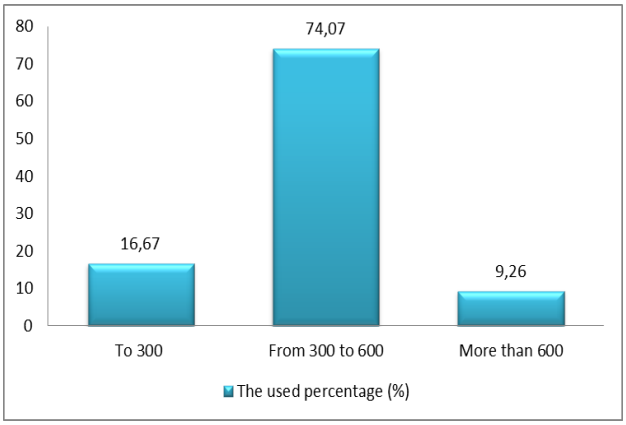

Figure 2: The percentage of possessing computers by the income of the households

Information related to computers is as follows: the usage percentage is of 88,89 %, or 83,33 % have one computer, 11,11 % of households do not have computers, 44,44 % of households possess lap-top. Mobile phones are hundred percent used by households and their average is by 2,94 pieces per households, but the fixed telephones there are only in Dragaš and Brod of 19,00 % (Table 5 and Figure 3). All households with income of more than €300, possess computers.

Table 5: Number of TV, computers and mobile phones by households

Devices	TV (pc)				Computer (pc)				Mob. phone (pc)			
	1	2	3+	no	1	2	3+	no	1	2	3+	no
Usage (%)	61,11	22,22	5,56	11,11	83,33	5,56	0,00	11,11	27,78	22,22	50,00	0,00

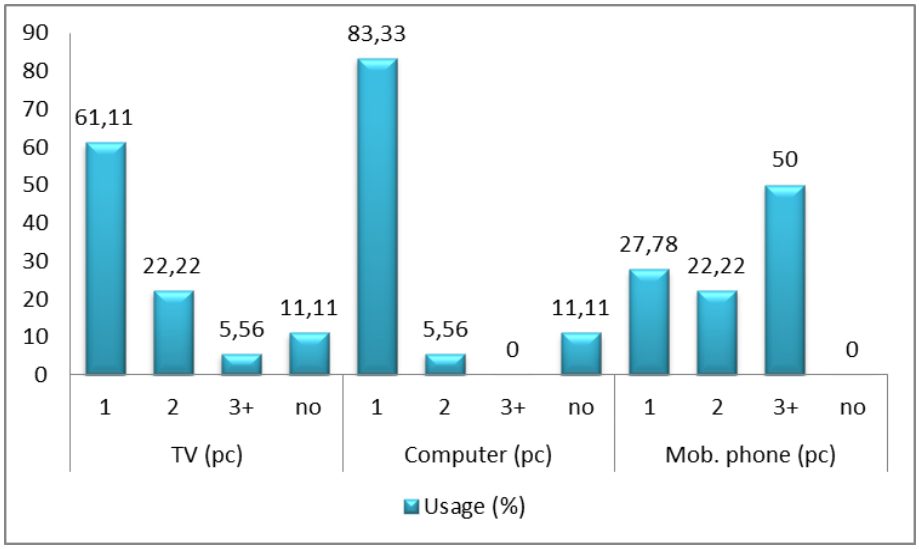

Figure 3: Number of TV, computers and mobile phones by households

Compared with Serbia for 2012, the used percentage of TV is 98,20 %, cable TV of 44,50 %, mobile phones of 83,90 %, computers of 55,20 %, laptops of 21,40 %. One computer is possessed by 89,90 % of households, two computers by 8,80 %, and three computers by 1,00 %. It is worth to mention that there is a difference between of urban and rural part, which is 60,80 % to 39,70 % [10].

Montenegro in its research shows that the number of used computers is 51,30 %, laptop 33,60 %, fixed telephones 59,20 %, mobile phones 93,30 % and TV 99,00 % [13].

The situation in which is Gora area forced the population to be well-equipped with information and communication technologies, in order to have close ties with the members of their families who are located all over the world. Much influence is caused by security situation in which are the citizens of Gora area. It is worth to note that the most advanced technology mainly emerged after the war, respectively in 1999. The Internet, mobile phones and cable television (terrestrial) are new in these areas.

The population of Gora area is rural; the only exception is the town of Dragaš which is located in a very poor state of infrastructure and urban.

The main conclusion is that 88,89 % of households have computers, which is significantly beyond the average of the developing countries. Compare with the percentage in Belgrade which stands 61,00 %, in Vojvodina of 53,00 %, then we come to the great differences in the use of the computers [10].

However, if someone who does not know the situation in which Gora area is located, analyzed the results of research, he would come to the conclusion that it is a highly developed area with highly developed advanced technology, but the truth is quite different. Namely, information and communication technology is used as a means of communication between family members, relatives and friends. These data show that the households do not have a TV (11,11 %), but they are 100 % equipped with mobile phones, or averagely there are 3 mobile phones per household, and this is concern and constant liaising between members of households in both Gora area and beyond. The use of mobile phones is a daily activity.

In table 5 the comparative analysis of the use of information and communication technologies with certain countries of the region is presented.

Table 5: The use of devices in the households [authors of the study and 10, 13]

Devices	The use percentage (%)		
	Gora area	Serbia	Montenegro
TV	88,89	98,20	99,00
Mobile phone	100,00	83,90	93,30
Cable TV	61,11	44,50	12,80
Laptop	44,44	21,40	33,60
PC	88,89	55,20	51,30
Fixed telephone	19,00	51,00	59,20

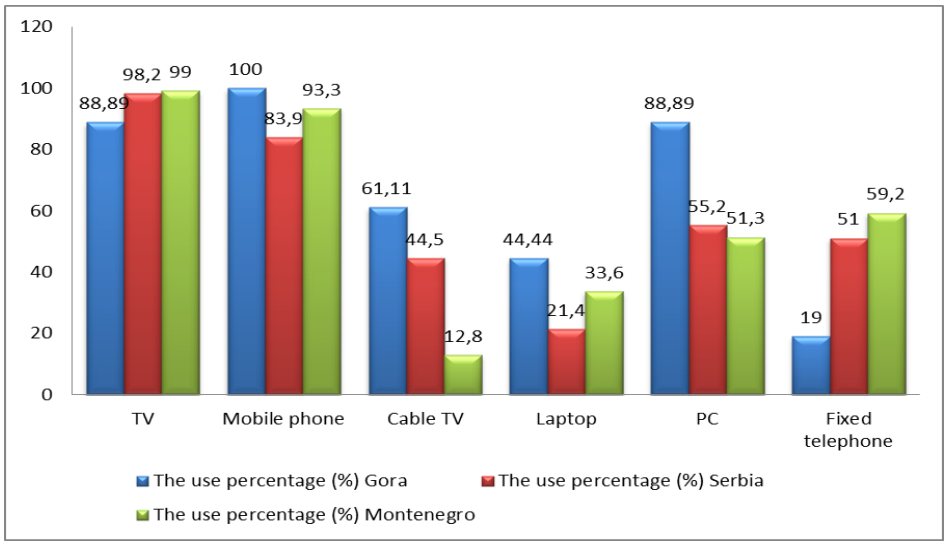

Figure 4: The use of devices in the households [authors of the study and 10, 13]

If you look at the survey data related to computers by individuals it is very interesting in the last three months, which is almost hundred percent. Each day individuals use about 76,47 %, weekly 17,65 %, and monthly 5,88 %. The largest use of computers is at home 88,24 %, at home by others of 47,06 %, at work is 29,41 %, and in education institution it is 41,18 % of the respondents.

More than three months but less than one year the computer was used by 5,88 % of individuals but none of the respondents did not respond to the use more than a year, as well the answer that they never used a computer. From the mentioned data it is seen that the computer is often used. From free conversation almost all respondents stated that they have no other form of entertainment and opportunities to go to the movies, theater, concerts and other manifestations or sport games and so on. Thus, almost every day they are socialized with their computers and contact their intimates who are out of Gora area.

If we compare the use of computers by individuals in Serbia, which is presented for the 2012 and is 55,00 % in the last three months, 2,00 % of individuals used a computer for more than three months, and 4,1 % more than a year. But, 38,90 % of individuals have never used a computer. More than 3 million of people have used a computer in the last three months. Mostly the computer was used by 99,5 %, followed by employees with 79,20 %, while 46,90 % by unemployed persons. The use of a mobile phone is almost a daily activity [10].

The use of computers in the last three months in Montenegro is 58,80 %, more than three months 3,00 %, more than a year 4,00 %, and 34,20% of the respondents have never used computers [13].

The most striking data for all three territories is the percentage of the respondents who never have used a computer is very high and there is a strong aversion to information and communication technologies, particularly in aged layers of the population. Motivation and digital awareness is necessary and essential in solving of problems and with the support of digital literacy is possible to change the attitude towards ICT in information society.

IV. CONCLUSION

Research has shown that Gora area is at the beginning of development of information society and there is a need to overcome a number of obstacles, commencing from infrastructure development, improvement of hardware and software potentials and the necessary education.

It is almost impossible to make the change at personal, organizational and national levels, democratization of society, free flow of information without the development of new knowledge and advanced technologies. Within the competences the future is reflected in the acquisition of the necessary knowledge of the entire population of the e-business, e-skills, or digital awareness and digital literacy.

The process of building the information society is essential. The European Union has adopted the European strategy for sustainable and comprehensive development under the name of Europe 2020, which is reflected and based on seven pillars: interoperability and standards, trust and security, fast and high speed of the Iinternet access, improvement of digital literacy, skills and inclusion.

The digital gap has hit Gora area, as well as Central and Eastern regions, especially the South-Eastern Europe, which reflects the difference in the use of ICT. The solution would be reflected in the implementation of appropriate ICT infrastructure, available and inexpensive Internet access, generalized ability to use information technology and the availability of useful contents.

A good example of the success are the former developing countries such as South Korea, Malaysia and Singapore, where the programmes of massive information education of the whole society are implemented. Digital awareness in the developed countries is nearly 100 %, and digital literacy is 70-80 %, while in developing countries the digital awareness is 20 % and digital literacy is 10 % [7, 12].

This research can help to contribute to the quality of life of elderly people that in addition to communication with the intimates enable fast and efficient assistance in case of need, which leads to reduction of anxiety as a result of the subjective feeling of loneliness. And not only the elderly, but also other members of the household.

The possibility of improving the modern technologies can greatly help communication and automatic sending of alarm signal massages in case of medical and other problems that require urgent solution. Some new systems that will be based on the use of modern mobile phones, devices or sensors, which are very favourable at the moment, combined with wireless sensors.

A mobile that has software adapted to elderly and chronic patients or others, would allow activation of the basic functions, for example, dialing of important numbers is very easy, without the knowledge of modern user interfaces.

In the same way it is possible to offer a solution for computers and some custom software, or the Internet access. Something similar to what is used in smart houses, but that would be acceptable for household or individual.

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