

EVALUATING THE INFORMATION SOCIETY IN ROMANIA

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ABSTRACT

The Information Society involves intensive the use of information in all areas of activity and has significant social and economic impact. This study aims to measure the information society in Romania and to compare the results with those registered by the other 28 member states. In order to measure the information society in Romania three methods will be applied: first of all we will measure the influence of information and communication technologies (ICT) on GDP, afterwards we will use the indicators from the ICT Development Index (IDI) to compare the results registered in Romania with the average registered in the European Union and in the end we will present the cost and affordability of ICT services using ICT Pricebasket. Even though Romania registered some improvements and followed the EU trend we are still far below the European average being almost in the last place at all indicators investigated. In order to earn a better place, Romania should implement a series of policies, following the directions proposed by the European Commission in 2010.

KEYWORDS:*Information society, information and communication technologies, European Union*

JEL CLASSIFICATION:*D80, H59, O30, O52, N14*

1. INTRODUCTION

We live in an era characterized by continuous changes generated by the emergence of new technologies, the transition to the knowledge based economy and globalization and their impact on the society is never seen before. The basis of this transition was ensured by the development of information and communication technologies (ICT) who brought improvements in manufacturing, services, trade relations, work characteristics and even in the everyday life.

Nowadays we can not imagine society without telephone or internet therefore the knowledge transfer between societies will be almost impossible without these tools. The adoption of information and communication technologies in all fields was the main architect of the transition from post-industrialism to the information society.

The information society is a new form of society in which the access to information is equal and universal and along with the informational and communicational infrastructure it contributes to socio-economic development and improves the quality of life. It involves intensive use of information in all areas of activity with significant social and economic impact.

Romania began the transition to the information society in the mid-1960s when one of the biggest technological programs was started. The program was focused on microelectronics, computers and informatics. Unfortunately, even if the program started to set the basis of information society it was stopped in the mid-1980s by the leader of the country due to fears caused by the socio-political

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consequences of the information revolution (Draganescu, 2001). After 1990s many programs were developed in this direction and although many of them were made by professionals none had the expected success.

This study aims to present three of the most important methods of information society measurements and to perform the evaluation of information society in Romania by showing the influence of ICT on GDP and by using ICT Development Index (IDI) indicators and ICT Price basket (IPB). In order to create an overview on Romania's performances we will compare some of the results with the ones registered in the European Union.

2. THEORETICAL BACKGROUND

The development of the information and communication technologies and the internet led to a new stage of society development – the information society. ICTs are being increasingly used in all human activities and are closely related to economic growth.

Even though the concept of “post-industrial society” was first presented in 1914 by Ananda K. Coomaraswamy and Arthur J. Pentz, the concept of information society first appeared in the early 1960s when the economies of the most advanced countries were moving from manufacturing to services and the role of technologies was raising.

There is no universally accepted definition of the concept, therefore, many scientists or institutions have different opinions about it. In order to have a better understanding of the concept we will present two definitions to be representative:

- A society that organizes itself around knowledge in the interest of social control, and the management of innovation and change (Daniel Bell, 1976);
- A society where work, economic transactions, communications, information sharing, developing relationships, and interactions involving individuals, organizations, governments, and communities are conducted via information and communication technologies (Ramsamy, 2010);

Most of those who have studied the concept talk about the information society as the society in which production and consumption of information is the most important type of activity, information is recognized as a primary resource and information and communication technologies are core technologies.

In Europe, information society first appeared in 1979 when the European Council stated that ICT had important implications in the social, economic and political life of the community. Since then information society won an increasingly important role in the EU agenda, the main goal of any policy or strategy in this direction was to attain competitiveness for EU in the global economy (Tubtimhin, Pipe, 2009). Implementing common policies in the European Union led to similar levels of ICT development and affordable access to ICT within all member states (ITU, 2012). In 2010 the European Commission started to implement the Digital Agenda in order to bring the differences between the member countries close to zero (European Commission, 2010).

One of the main factors that led to the information society is the evolution of technologies in a way never seen before. In only 20 years all the population has access to a wide range of informational reassures and the ICT sector has developed continuously. ICT intervenes in the business environment, underlies the proper functioning of companies, provides an efficient infrastructure to the governments and companies and adds value to all processes (UNESCO, 2002). From a theoretical point of view ICT refers to a wide set of tools used to create, manage, store and disseminate information and to foster the communication (Blurton, 2002).

Due to the fact that there is no commonly accepted definition of the concept, there is no universally system that can measure the information society. Several specialists or institutions proposed different measuring methods: Machlup (1962), Porat (1977), Timmer et al (2010), the Organization for Economic Cooperation and Development – OECD (2002), United Nations – UN (2008), European Union – EU (2009), International Telecommunication Union – ITU (2012), Eurostat (2013) or World Bank (2012).

3. METHODOLOGY

In order to present the actual stage of ICT in Romania we used 3 methods. First of all we will present the share of ICT sector in GDP in Romania and compare it with the EU countries, secondly we will use the indicators from the ICT development index (IDI) to compare the 2013 performance of Romania with the one from 2011 and with the one from Europe, and we will present the affordability of ICT by using the ICT Price Basket.

3.1 Share of ICT sector in GDP

The evaluation of the share of ICT sector in GDP was done using data provided by Eurostat. The latest data available was from the year 2010 and the following graph will exclude Croatia, Cyprus, Greece, Ireland, Italy, Luxemburg, Malta and Netherlands because no data was provided for them. Also a comparison between different years was not possible due to the change of the ICT sector definition as a consequence of change of the underlying classification as Eurostat stated on the official site. The value added at factor cost is defined as gross value added minus other taxes less other subsidies on production.

3.2 ICT development index – IDI

The ICT Development Index (IDI) is a composite index combining 11 indicators into one benchmark measure that serves to monitor and compare developments in information and communication technology (ICT) across countries (International Communicational Union – 2012). IDI can be divided into three parts: ICT readiness (basically referring to ICT infrastructure), ITC intensity (referring to the use of ICT in the society) and ICT skills (referring to the outputs of ICT use);

ICT readiness has five different indicators and presents a view of the present infrastructure that exists in Romania. The indicators are presented below:

- a. Fixed-telephone subscriptions per 100 inhabitants – all voice telephony services using fixed infrastructure;
- b. Mobile-cellular telephone subscriptions per 100 inhabitants – all voice telephony services using cellular infrastructure;
- c. International Internet bandwidth per Internet user – the total used capacity of international Internet bandwidth;
- d. Percentage of households with a computer – the number of houses with a computer as a percentage of total households;
- e. Percentage of households with internet access – the number of houses with internet access as a percentage of total households;

ICT use has three indicators, explained below, and presents the use of the ICT infrastructure in society.

- a. Percentage of individuals using the internet – the number of persons who are using the internet as a percentage of total population;
- b. Fixed/wired broadband subscriptions per 100 inhabitants – all internet subscriptions using fixed infrastructure;
- c. Active mobile broadband subscriptions per 100 inhabitants – all internet subscriptions using mobile-broadband infrastructure;

ICT skills also has three indicators referring to the results of the ICT use:

- a. Adult literacy rate – the percentage of population (> 14 years) who can read and write and can understand a short simple statement (Unesco Institute of Statistics – UIS, 2012).
- b. Secondary gross enrolment ratio – the percentage of population enrolled in the secondary level of education (UIS, 2012);

- c. Tertiary gross enrolment ratio – the percentage of population enrolled in the tertiary level of education (UIS, 2012);

3.3 ICT Price Basket – IPB

The ITU ICT Price Basket (IPB) is a unique global benchmarking tool that provides insightful information on the cost and affordability of telecommunication and information and communication technology (ICT) services (International Communication Union – 2012).

IPB takes into consideration three prices: the price of fixed telephone, the price of mobile-telephone and the price of fixed-broadband services (internet). Using normalization of data all prices are presented as percentage of average gross national income (GNI) per capita. In order to calculate the three indicators we will take into consideration:

- a. For fix-telephone prices: the subscription fee + cost of 90 minutes conversations;
- b. For mobile-telephone prices: the monthly fee + cost of 90 minutes conversations + 100 messages;
- c. For fixed broadband sub-basket: the basic monthly fee;

4. RESULTS

In order to create a complete data set with values regarding the same years there were used several techniques. All values were transformed in the same unit using normalization of data and missing time entries were calculated taking into consideration the indicators from the last 5 years.

4.1 Share of ICT sector in GDP

Taking into consideration the latest data provided by Eurostat in 2010 the average share of ICT sector in GDP of the selected European states far exceeds the share registered in Romania.

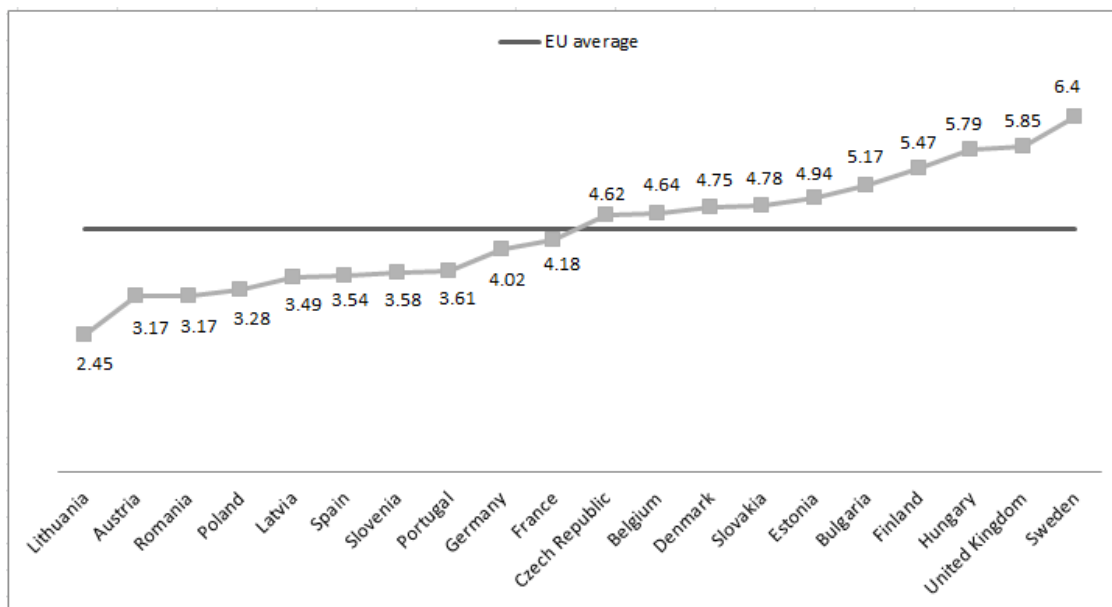


Figure 1. Share of ICT sector in GDP
 Source: own study based on Eurostat data

The lowest share of ICT in GDP was found in Lithuania (2.45%) and the biggest one was found in Sweden (6.4%). The average for the selected countries was (4.38%) and Romania is situated below the average with 3.17% at par with Austria. The best position from the east European countries is

taken by Hungary with 5.79% followed by Bulgaria with 5.17% while Romania has the worst position in this area. All the selected countries should increase the efforts in this area as the ICT sector has a big impact on the economic growth.

4.2 ICT development index – IDI

The data for the IDI method was obtained from the following databases: the International Telecommunication Union - ITU, WorldBank - WB, Unesco Institute of Statistics – UIS and the National Institute of Statistics from Romania – NIS. As the data was gathered from four sources we will not use it to calculate the IDI value but we will use this methodology to compare the performances obtained in Romania with the ones from Europe.

First of all we will compare the indicators from two different time entries for each of the three parts of IDI.

As presented before, ICT readiness is calculated based on five indicators. Between 2011 and 2013 we can see increases at international internet bandwidth per internet user, percentage of households with a computer and percentage of households with internet access but unfortunately we can also see decreases in fixed telephone subscribers per 100 inhabitants and in mobile-cellular telephone subscriptions per 100 inhabitants.

Even though not all indicators have increased no major concern should be raised as the growth and the decrease rates are very low. It seems that the European common policies for the ICT sector and the harmonized telecommunication regulations reached their target. This performance is also a result of the Digital agenda set by the European Commission in 2010 as part of the Euro 2020 economic development strategy.

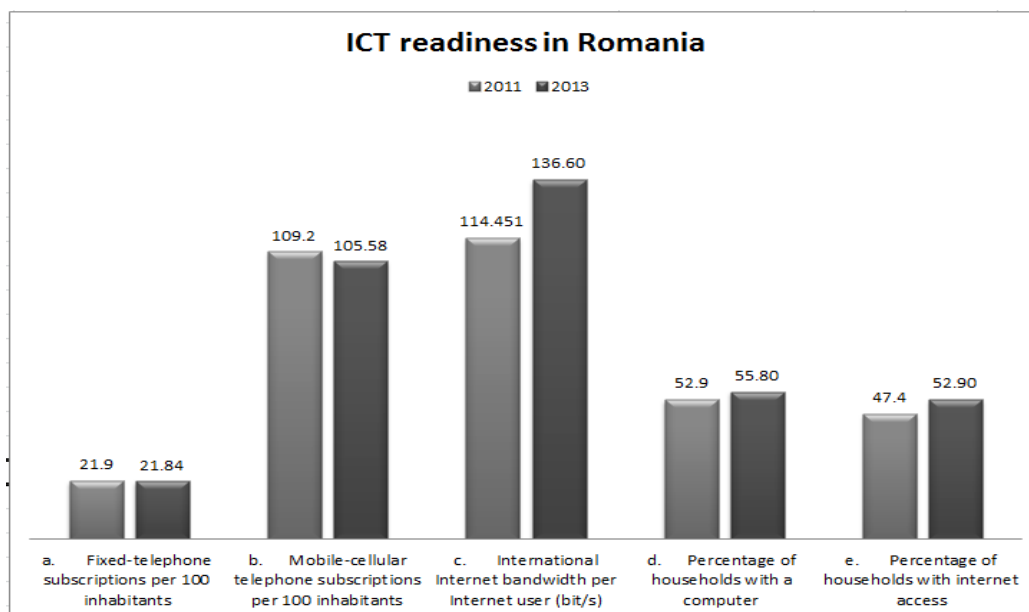


Figure 2. ICT readiness in Romania

Source: own study based on ITU and Worldbank data

ICT use is composed of three indicators and Romania registered increases on all of them. The biggest increase rate was at the active mobile broadband subscriptions per 100 inhabitants indicator with 48% growth followed closely by fixed/wired broadband subscriptions per 100 inhabitants with 42% increase and by the percentage of individuals using the internet with only 13% increase. In this sub-section also, Romania follows the trend set by the European countries demonstrating that the

efforts to align to the European countries are not in vain. This also demonstrates that the homogeneity of European countries increases and the digital divide is lower.

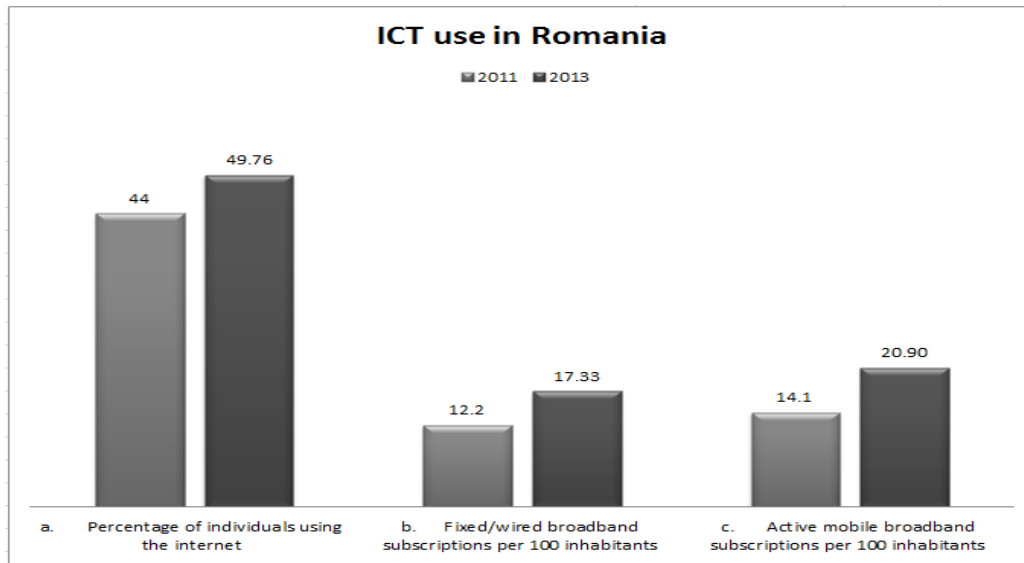


Figure 3. ICT use in Romania

Source: own study based on ITU and Worldbank data

In the ICT skills sub-section we can see a normal stagnation at adult literacy rate and secondary gross enrolment ratio but unfortunately the tertiary gross enrolment ratio suffered a 24% decrease. The stagnation of the first two indicators is normal in the developed countries where high levels were already achieved but the results obtained at the last one demonstrates that Romania should implement a set of policies to stimulate a bigger level of enrolment.

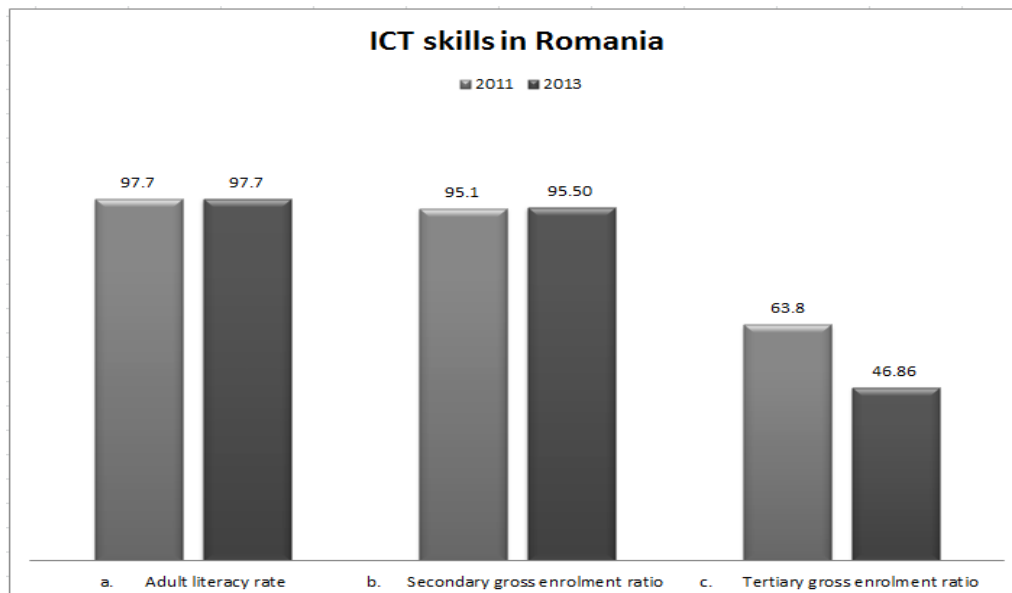


Figure 4. ICT skills in Romania

Source: own study based on ITU and Worldbank data

If we could consider that aligning to the European trend should be a good sign, if we compare the results obtained by Romania with the average obtained in Europe (Table 1) we can actually see that we are below average at all eleven indicators.

The worst situation can be seen at the active mobile broadband subscription per 100 inhabitants where we are at 32% of the EU average. Even though there have been improvements since this indicator raised with 48% it seems that if we want to narrow the digital divide more policies should be taken in this direction.

The best performance was registered on the first two indicators from the third sub-section but unfortunately that doesn't put Romania on a strength position.

The other indicators which registered increases but not enough to reach the European average are: international internet bandwidth per internet user (at 98% of the EU average), percentage of households with a computer (still at 68% of the EU average), percentage of households with internet access (still at 68% of the EU average), Percentage of individuals using the internet (still at 67% of the EU average), Fixed/wired broadband subscriptions per 100 inhabitants (still at 62% of the EU average).

There are some indicators under the European average which registered decreases: fixed-telephone subscriptions per 100 inhabitants (currently at 55% of the EU average), mobile-cellular telephone subscriptions per 100 inhabitants (at 85% of the EU average), tertiary gross enrolment ratio (at 73% of the EU average)

Table 1. Comparison between Romania and the European countries

	RO	EU
ICT readiness		
a. Fixed-telephone subscriptions per 100 inhabitants	21.84	39.65
b. Mobile-cellular telephone subscriptions per 100 inhabitants	105.58	122.85
c. International Internet bandwidth per Internet user (bit/s)	136.60	139.08
d. Percentage of households with a computer	55.80	81.60
e. Percentage of households with internet access	52.90	78.03
ICT use		
a. Percentage of individuals using the internet	49.76	74.75
b. Fixed/wired broadband subscriptions per 100 inhabitants	17.33	27.71
c. Active mobile broadband subscriptions per 100 inhabitants	20.90	63.83
ICT skills		
a. Adult literacy rate	97.7	99.00
b. Secondary gross enrolment ratio	95.50	96.08
c. Tertiary gross enrolment ratio	46.86	70.08

Source: own study based on ITU and Worldbank data

4.3 ICT price basket - IPB

In order to show the affordability of the ICT for Romania's population and to compare it with other European countries we will present the ICT price basket for a selection of European countries.

Romania has the second most expensive access after Bulgaria with a percentage of 2.2 of countries' average gross national income (GNI) per capita at the same level with Hungary. The cheapest access is in Denmark and Luxembourg with 0.5% of GNI per capita and the most expensive

is in Bulgaria at the level of 3.7% of GNI per capita. The European average is at the level of 1.5% of GNI per capita and we can notice that all the countries above the average are from East Europe (beside Poland and Czech Republic).

The below graph shows that the countries with the highest income level have the most affordable ICT services. Even though the prices have decreased in the last few years and we are far below the world average there is still a significant gap to be recovered to eliminate the regional digital divide.

Although Romania does not have a good ranking, the variation from the lowest to the biggest value is not very big showing that the ICT policies imposed by the European Union are leading to affordable and homogeneous access to ICT.

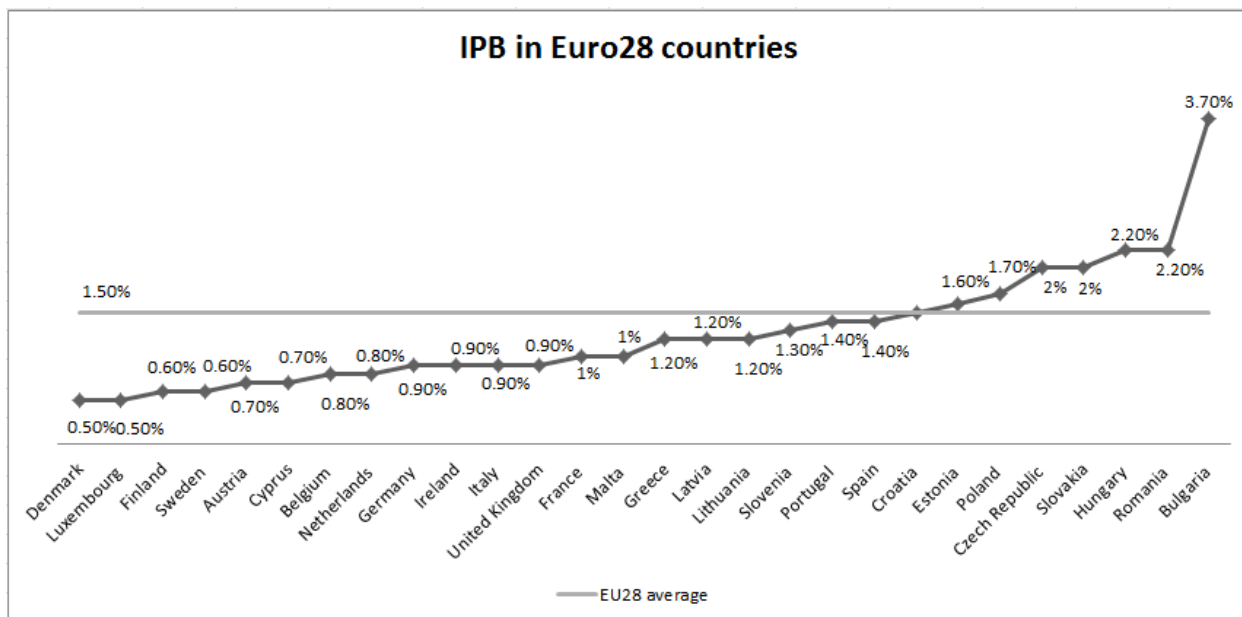


Figure 4. ICT price basket in EU28

Source: own study based on ITU data

5. CONCLUSIONS

Using the data provided by ITU, Eurostat, World Bank and the National Institute of Statistics from Romania we showed that great strides or setbacks (except for the tertiary gross enrolment ratio indicator) towards developing informational society were not made in the last years in Romania. Our country occupies the last places at all indicators analyzed and lost the competitive advantage that we had on some indicators from the ICT readiness and ICT use subsections (ex. international internet bandwidth per internet user).

Analyzing the below research several key ideas can be drawn: the share of ICT sector in GDP is among the lowest in Europe, mobile-cellular and fixed-telephone penetration has reached saturation, improvements should be made in the number of households with a computer and with internet access, a series of policies should be implemented in order to have a higher level of tertiary gross enrolment ratio and if Romania does not invest more in infrastructure the ranking on the international internet bandwidth per internet user indicator will be lower therefore will lose this competitive advantage.

In order to make significant progress toward information society, Romania should implement a series of policies correlated with the ones already proposed by EU in the Digital Agenda. Also some steps in this direction are and will be made by the European Union through the pan-European projects or EU-coordinated policies and regulations but they aim the overall development of Europe and not the development of competitive advantages for some countries.

This study can be very useful to the researchers and practitioners who are interested in the concept of information society. Reusing these models by updating the data can create an overview at any future moment or for any country. The model has, however, some limitations due to the lack of values or their collection from various sources. In order to create a complete data set with values techniques like forecasting or normalization of data were used. Also the methodology developed by IDI is not unanimously accepted at international level, some questions can be raised on the selection of the 11 indicators from the whole list proposed by ITU or on the relevance of the indicators used in the ICT skills sub-section.

This work can be used as a foundation for future researches by analyzing the factors that influence the selected indicators and through a series of comparisons taking into account the current socio-economic situation and the situation in different geographical areas.

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