

# Informational society- a comparative analysis in the candidate countries

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*Abstract:* Given the close integration of Romania and Bulgaria into the European Union at the beginning of 2007, each of them must bring its contribution to implementing the required standards into each domain. In this article we develop a comparative analysis about the competitiveness of candidate countries in the ICT domain, and their level of alignment to the incumbent EU nations, using four indicators.

*Key-Words:* informational society, indicators, candidate countries.

## 1. Introduction

EU enlargement is a process in course and its economic impact is significant for new and also for old members. The newcomers stand to benefit from investments from firms based in Western Europe and from access to EU funding for their regional and social development [11].

Romania and Bulgaria as candidate countries have to align to EU policies and strategies in all domains. One important domain is informational technology and its result is the informational society.

In March 2000, Europe's heads of state and government met in Lisbon, Portugal, and declared their intention to make the European Union (EU) “the most competitive and dynamic knowledge based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion.” To achieve this goal by 2010 they adopted what is now called the Lisbon Strategy of economic and structural reforms [11].

Several researches have focused on evaluating the e-Readiness of countries. For instance, the Cap-Gemini study on Online Availability of Public Services focuses on benchmarking the progress of online public services of 18 countries in Europe. The Economist 2003 e-Readiness Ranking, on the other hand provides a benchmark to compare and assess the e-business environments of 60 countries worldwide. Similarly, the Networked Readiness Index, a joint study by INSEAD, the World Economic Forum and Infodev of the World Bank benchmarks the level of ICT development of 102 nations worldwide. The e-Europe study 2005 covers the subset of EU-15 countries, the ten New Member

States and the 3 candidate countries and it was the first research stream to address the problem of alignment of NMS on the basis of the e-Europe action plans, and in accordance with the guidelines of the European Union. [5]

By our study we intend to determine the degree of similarity between the European Union countries and the candidate countries using some well-known indexes. The indexes allow us to benchmark the country ICT performance, and determine the effectiveness of policy.

## 2. Methodology

As the Informational Society extends to all aspects of social and economic life, it is important to develop and use good indicators to track its evolution and its impacts. The informational society, important element of Lisbon Strategy will be analyzed followed by a comparative approach between candidate countries and the EU average and between the candidate countries.

For our research we use general indicators like:

- *Lisbon index* of competitiveness and the informational society sub-index,
- *networked readiness index*, measures the degree of preparation of a nation or community to participate in and benefit from ICT developments.
- *e-Europe 2005 index* assesses countries on the basis of their ICT development and Internet usage
- *ITU indicators for Informational society* part of Digital Access Index (DAI) measure the overall ability of individuals in a country to access and use new ICTs.

We use these indicators in order to determine the degree of similarity between the candidate countries Romania and Bulgaria and between them and European Union averages.

### 3. General data about Romania and Bulgaria

The Lisbon Strategy includes eight distinct dimensions, considered to be critical for national competitiveness[11]:

- a. Creating an information society for all
- b. Developing an European area for innovation, research and development
- c. Liberalization: completing the single market, state aid and competition policy,
- d. Building network industries: in telecommunications, in utilities and transportation
- e. Creating efficient and integrated financial services
- f. Improving the enterprise environment: for business start-ups, in the regulatory framework,
- g. Increasing social inclusion: returning people to the workforce, upgrading skills, modernizing social protection
- h. Enhancing sustainable development

The country overall Lisbon score is calculated as an average of the individual scores in the eight dimensions. The scores are on a scale from 1 to 7, with larger values representing stronger performance. Table 1 presents the scores for Romania and Bulgaria. For comparison, we have also included the EU average for each element in a separate column and at the bottom of table the average score for EU Romania and Bulgaria.

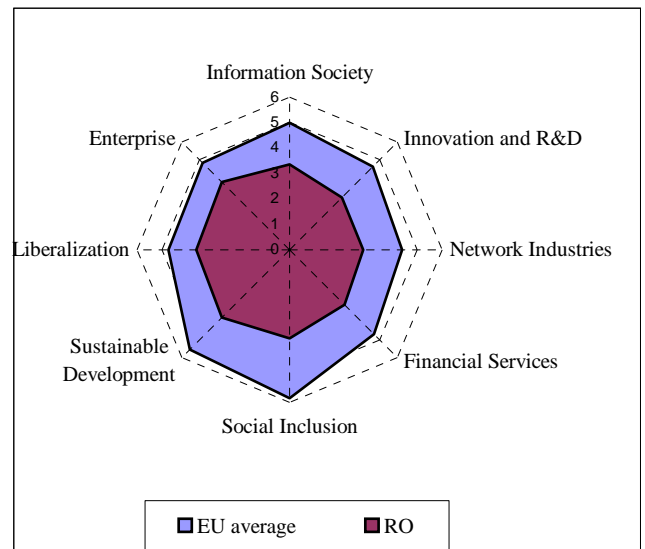
Indicators	EU	RO	BU
Information Society	4,97	3,35	3,25
Innovation and R&D	4,61	2,91	2,66
Network Industries	4,41	2,88	2,94
Financial Services	4,69	3,04	3,26
Social Inclusion	5,81	3,48	3,54
Sustainable Development	5,52	3,77	3,64
Liberalization	4,74	3,65	3,81
Enterprise	4,81	3,74	3,07
<b>Average</b>	<b>5,16</b>	<b>3,33</b>	<b>3,08</b>

Table 1: Scores of Potential Accession Countries  
 Source: The Lisbon review- 2004 an assessment of policies and reforms in Europe –world economic forum

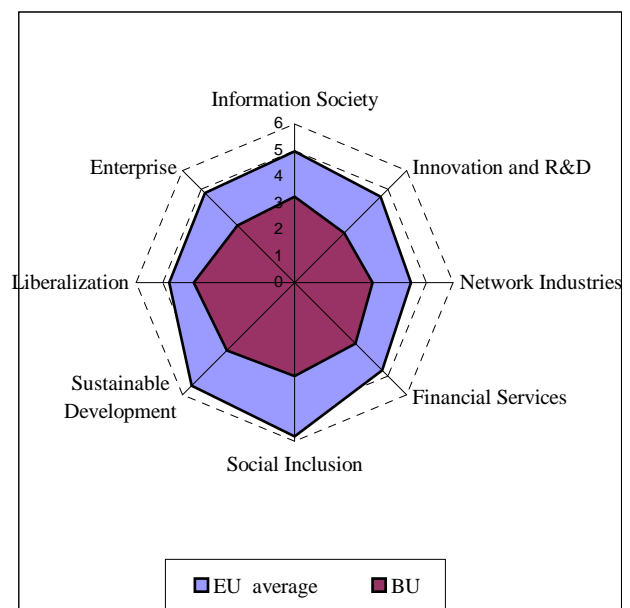
These two countries receive the lowest Lisbon scores among the members' states. Analyzing each from

eight components we can see there are minor differences between the analyzed countries as we can see in the following two graphs and major differences more than 1 in each dimension comparing with EU average.

Comparing the candidate countries, Bulgaria receives lower scores than Romania in four out of eight Lisbon dimensions (information society, financial services, social inclusion, sustainable development) and Romania receives lower scores than Bulgaria also in fours out of eight Lisbon dimensions (innovation and R&D, network industries, liberalization, and enterprise ).



Graph 1: Lisbon index of Romania



Graph 2: Lisbon index of Bulgaria

The two candidate countries perform comparatively poorly across all eight dimensions.

It is difficult to point out specific areas of strength or weakness between these two countries as they score fairly low across the board, when compared to both EU average, as well as the other acceding countries. As reference we take the first place in Europe Finland with 5,80 score, the last position from EU15 Greece with 4.00 score, and from the last enlargement group Hungary 4,12, Slovak republic 3,89 and Poland 3,68.

It is clear from the scores that much have yet to be done in candidate countries, across all dimensions, in order to bring them to the level of competitiveness intended by the Lisbon.

Overall, our analysis suggests that reaching the Lisbon goal will, indeed, require continuous efforts to improve the competitive environments of the accession countries.

In the area of information society we can conclude that between Romania and Bulgaria is a minor difference (0,10) but the difference is significant between candidate countries and EU average. (1,67)

#### 4. Networked Readiness Index

The **Global Information Technology Report** has become since it was first launched in 2001, a valuable and unique benchmarking tool to determine national ICT strengths and weaknesses, and to evaluate progress. It also highlights the continuing importance of ICT application and development for economic growth. The 2005 Report uses the **Networked Readiness Index** (NRI), covering a total of 115 economies, to measure the degree of preparation of a nation or community to participate in and benefit from ICT developments.

The NRI is composed of three component indexes which assess [6]:

- the environment for ICT offered by a given country or community
- the readiness of the community's key stakeholders - individuals, business and governments
- and the usage of ICT among these stakeholders.

Countries	Rank 2005	Rank 2004	Rank 2003
Romania	58	53	61
Bulgaria	64	73	67

Table 2 : Networked Readiness Index 2003-2005

In 2003 the difference between the candidate countries was 6 points, in 2004 the difference grew up at 20 points and in 2005 the difference came back at 6 points due to the different evolution of Romania and Bulgaria in the period 2003-2005. In the period 2004-2005 Romania lost 5 points and Bulgaria gained 9 points.

The candidate countries Bulgaria and Romania have relatively lower ranks on the Networked Readiness Index for analyzed period.

#### 5. Information society (e-Europe index)

In the light of the importance of the development of the Information Society, the EU has elaborated e-Europe action plans that provide a framework in order to benchmark member states. The e-Europe Action Plans aims at facilitating the ubiquitous access to the benefits of the Information Society by European citizens.[5]

The e-Europe 2005 action plan follows the e-Europe 2002 action plan, and aims to help member nations tap the vast potential of an Information Society, to improve productivity and quality of life. While e-Europe 2002 focused on creating a knowledge economy by extending Internet connectivity in Europe, e-Europe 2005 aims to translate increasing levels of connectivity into economic activity and thus generate growth.

The e-Europe 2005 Index computed assesses 28 European Countries on the basis of their ICT development and Internet usage. The Index is a composite of 5 key indicators:

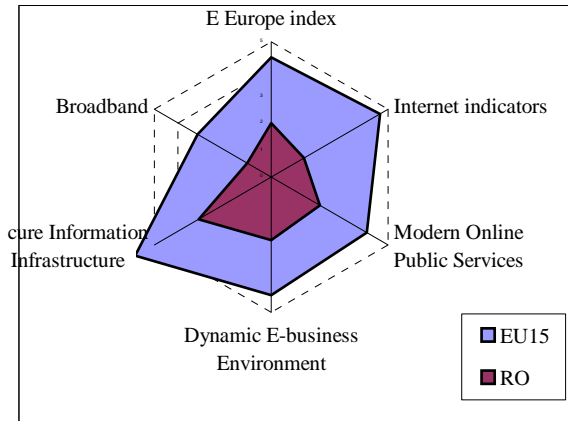
1. Internet Indicators
2. Modern Online Public Services
3. Dynamic e-Business environment,
4. Secure Information infrastructure
5. Broadband

This has been used to assess the comparative progress of the member countries and the candidate countries and the relative ranking of nations based on their degree of alignment to the EU-15 countries.

Indicators	EU15	RO	BU
Internet indicators	4,67	1,41	2,68
Modern Online Public Services	4,09	2,07	1,72
Dynamic E-business Environment	4,36	2,33	2,14
Secure Information Infrastructure	5,81	3,11	1,34
Broadband	3,14	1,02	1,19
<b>E Europe index</b>	<b>4,42</b>	<b>1,99</b>	<b>1,82</b>

Table 3: 2005 e-Europe index for Romania and Bulgaria Source: INSEAD 2004

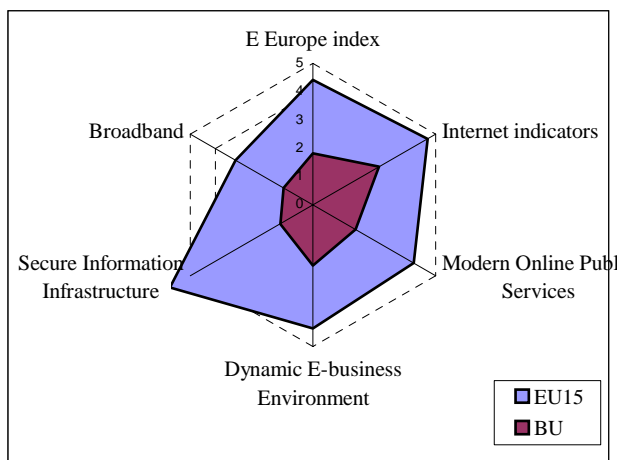
Based on the performance of the countries on the above 5 dimensions and their resulting e-Europe 2005 Index, the nations are divided into 4 categories: global leaders, totally aligned, partially aligned and development required. Candidate countries are the latest two in group IV - of countries needing to make some progress in order to align with the current 15 European member nations. In the same group are Lithuania, Hungary and Turkey.



Graph 3: E-Europe index for Romania

The differences between candidate countries and EU 15 average are high, over 2 points if we look at e-Europe index and each component. High differences between the candidate countries as we can see in graph 3 and 4, are in the following domains:

- internet indicators, where Romania with 1,41 score ranks the last position (28) whereas Bulgaria with 2,68 score ranks the place 24. The Internet indicators capture the degree of access to the Internet by individuals. It is composed of 3 main categories, namely citizens' access to and use of the Internet, enterprises access to and use of the Internet, and Internet access costs.
- secure information infrastructure where Romania with a 3,11 score ranks 20 position and Bulgaria with a 2,34 score ranks 24 position. The secure information infrastructure aims to evaluate the level of security of Internet access and of online commerce across different European countries.



Graph 4: E-Europe index for Bulgaria

### 6. ITU indicators of informational society

ITU indicators-Digital Access Index (DAI), are part of the global statistical system of the UN. ITU provides a set of indicators to benchmark the introduction of new technologies into everyday life. The index measures the overall ability of individuals in a country to access and use new ICTs. The DAI has been calculated for 181 economies and provides a transparent and globally measurable way of tracking progress towards improving access to ICTs.[11]

The DAI is built around four fundamental vectors that impact a country's ability to access ICTs:

- infrastructure,
- affordability,
- knowledge and
- quality and actual usage of ICTs.

Indicators at 100 habitants	RO	BU	EU28
fix phone lines	19,7	35,4	44,7
subscribers of mobile phone	45,9	60,4	89,5
internet users	20,2	28,1	43,2
PC	11,0	5,9	36,9

Table 4: Indicators of Informational Society in 2004

Source: International Telecommunications union [www.itu.int](http://www.itu.int)

At the first three of the four indicators Bulgaria is ranked better (rank 20,25,21) than Romania, who at the first two indicators is placed in the last position (rank 28,28,26).

The number of fix phone line per 100 habitants in 2004 is more under the EU28 average (44,67) in Romania (19,7). There is the same situation about the number of subscribers of mobile phone per 100 habitants. Both countries are in deficit at the number of PC at 100 habitants.

Despite some registered improvement, Bulgaria together with Romania continues to be lagging behind of the EU 28 average.

### 7. Conclusion

Comparing Romania and Bulgaria with EU 15 countries average in any field, there are significant differences. Recalculating the averages for the future EU structure with 28 countries, (including Romania, Bulgaria and maybe Turkey) the average is diminished and the differences between candidate countries and EU28 average are moderate in some domains but in the majority of them are still high. For example we recalculate for e-Europe index 2005 the averages for EU 28 countries.

Indicators	EU15	EU28
Internet indicators	4,67	3,91
Modern Online Public Services	4,09	3,58
Dynamic E-business Environment	4,36	3,54
Secure Information Infrastructure	5,81	4,34
Broadband	3,14	2,66
<b>E Europe index</b>	<b>4,42</b>	<b>3,64</b>

Table 5: 2005 e-Europe index for Romania and Bulgaria  
Source: INSEAD 2004

Bulgaria and Romania are countries which still have some way to go before they are aligned with the EU countries in respect to their in general and in particular in Information and Communications Technology. This can be seen from the plot of the degree of Bulgaria's and Romania's alignment with respect to the weighted average EU-15 value across the 5 key indicators of the E-Europe 2005 framework.

In Bulgaria the internet usage is constrained by an underdeveloped and outdated infrastructure, and many people still share telephone lines. In order to meet requirements of accession to the European Union, and in order to further the economic development of the country, the government is making efforts to develop communications and high-technology industries.

According to Sibis [12], some of the key objectives identified by the government are:

1. To promote investment in the ICT sector
2. To create a competitive, export-oriented software industry
3. To encourage small and medium sized businesses to compete in the ICT sector
4. To encourage young graduates to start their own businesses in Bulgaria

ICT is one of the most sought after areas of study by technical students, and currently the country benefits from a good supply of trained personnel. Nevertheless, the country suffers from a brain drain, and according to the National Statistical Institute, over 300,000 professionals have left the ICT sector in the last 10 years.

Romania has historically shown leadership amongst the East European countries in the ICT domain, and was a significant exporter of both hardware and software in Eastern Europe during the 1990s.

Internet Usage is low and Internet Access is extremely expensive. Several programs are in place in order to develop the e-Society in Romania in areas of e-Government, e-Health, ICT skill, and PC penetration and Internet access in schools.

Due to the late liberalization of the telecommunications market, low and unbalanced connectivity across the country is a barrier for an acceptable level of e-readiness in Romania. From the inclusive perspective of the Lisbon Strategy this fact is reflected in an underdeveloped Information Society. The Romania's accession to EU in 2007 has implicitly brought its active engagement towards the Lisbon objectives. In all the aspects considered to be critical for the national competitiveness, Romania is showing an obvious vulnerability against the globalization trends.

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