

Application of the Digital Opportunity Index to Bulgaria

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Money matters, but other drivers have no less impact in generating a high DOI ranking. An open economy and real competition are essential for improvement in the DOI.

BULGARIA is located in South East Europe (SEE), at the crossroads between Western and Central Europe and Middle East, Russia and Africa. Its neighboring countries are Turkey, Greece, Macedonia, Serbia, and Romania.

POPULATION: 7.72 million (about 3 million households)

GDP: \$28 billion

ECONOMY: ~75% private

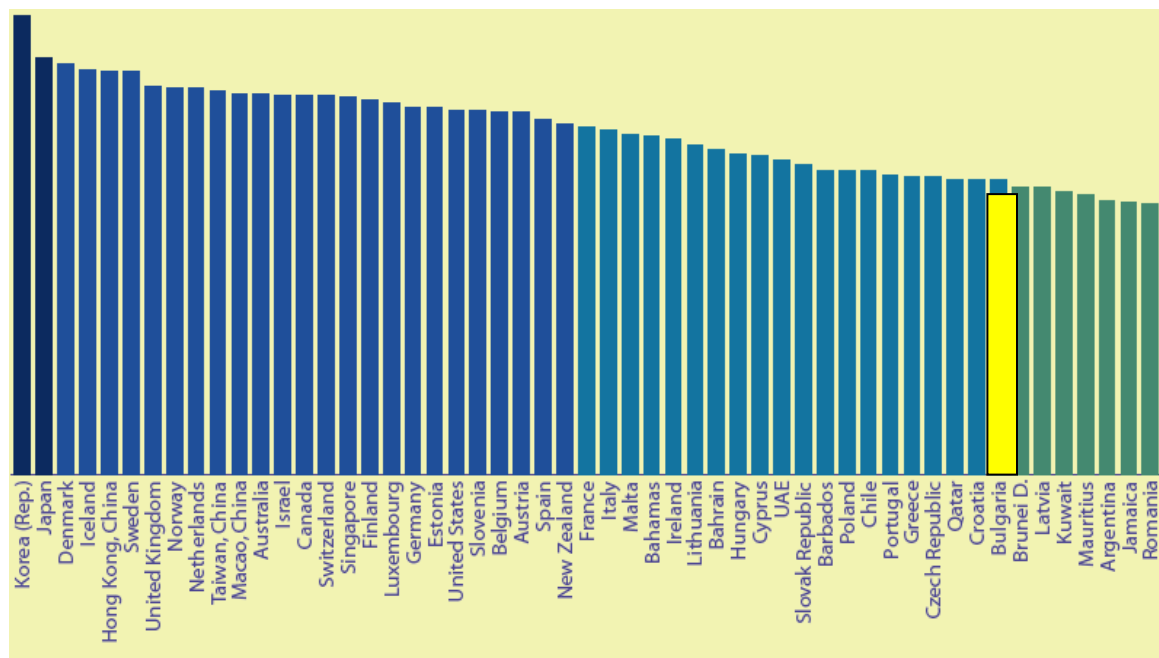
Expected EU membership from year 2007, free trade agreements with EU, EFTA, CEFTA, Macedonia, Turkey, Estonia, Lithuania, and Israel

GDP GROWTH: more than 5% for the last 5 years

INFLATION: about 4%

With a Digital Opportunity Index (DOI) of 0.50, Bulgaria holds 46th place in the ranking in the 2004/2005, developed by ITU and KADO. The country is in the group with DOI above 0.5. From its neighboring countries only Greece (EU member country) is slightly ahead, with an index of 0.51. Its other neighboring countries have substantially lower rankings. The newest available data may change the current DOI of Bulgaria for better.

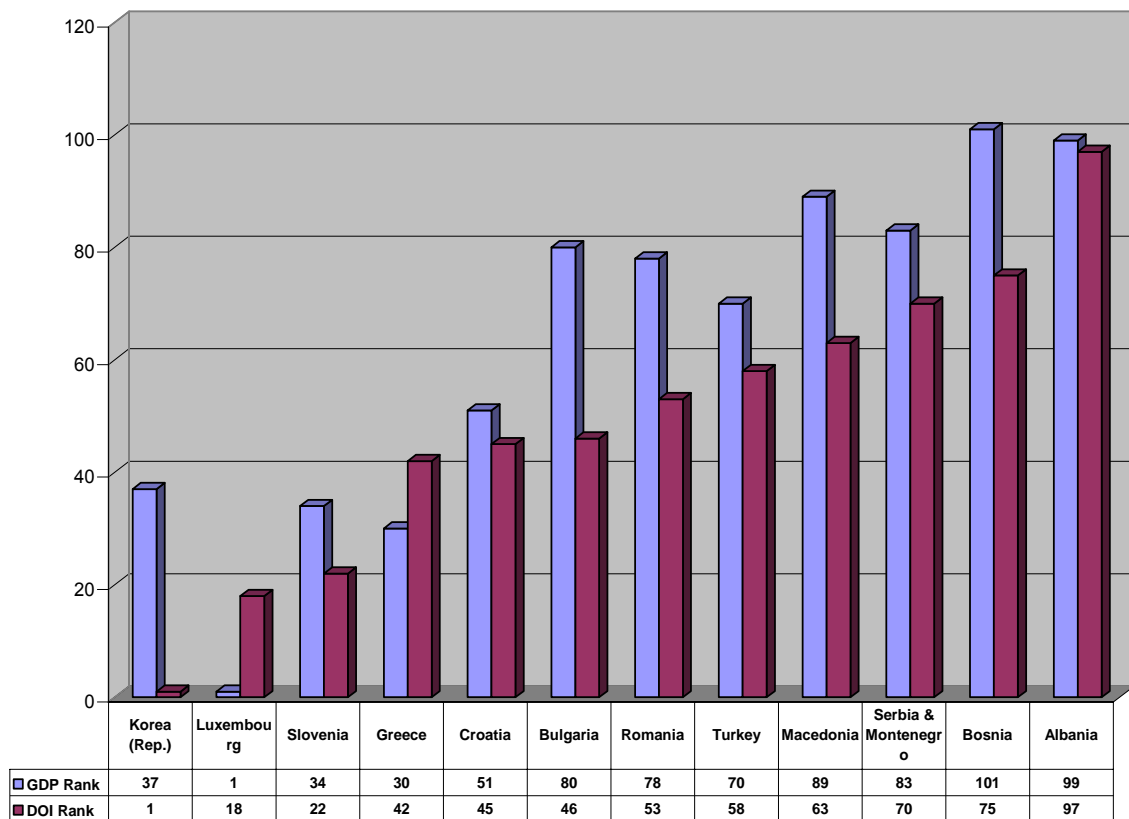
Figure 1: ITU ranking (World Information Society Report 2006, ITU, May 2006)



DOI and GDP Analysis

A comparison of DOI rankings and GDP rankings shows that a higher GDP ranking does not automatically mean a higher DOI ranking. For example, Luxembourg has the highest GDP ranking - 1 (\$56 230 per capita) but only achieved a DOI ranking of 18 (0.64), while Korea has a GDP rank of 37 (\$13 980 per capita) and a DOI ranking of 1 (0.79). Looking at Bulgaria and the other countries of South-Eastern Europe, it is clearly visible that these countries have in general higher DOI rankings than GDP rankings. In particular, Bulgaria is 46th in the DOI ranking, while it is 80th (\$2 740 per capita) in its GDP ranking. Only Greece shows the opposite pattern - DOI rank of 42 (0.51) versus GDP rank of 30 (\$16 610 per capita).

Figure 2: Comparison of DOI and GDP rankings



Source: ITU/KADO

In general, a higher DOI score/ranking means more ICT investment by government, companies and citizens. Why should countries with lower GDP achieve a better DOI ranking?

In a country like Korea, ICT development has been given a consistently high priority in government policies in the recent years. Therefore, the Korean government creates an environment for ICT development and services to thrive. Holding this event here in

Seoul is just another evidence of its high priority policy. Other, richer countries, such as Luxembourg and Greece, have other priorities and therefore their DOI rankings are lower.

SEE countries have relatively low GDP per capita. In most of them, ICT development is not the highest priority. For example, in Bulgaria, the government declares that ICT development is one of its top priorities, but the share of the budget for ICT is not so big. The driving forces here are the development of the economy, historical development of the ICT industry in the country, a good level of technical education, and enormous effort by Bulgarian private ICT companies to attract foreign investors. Another very important factor is the demolition of the monopoly of Bulgarian Telecommunication Company (BTC) in the land line communications and the opening of the competition in mobile communications. The demand from end-users to escape from the highly-priced and poor services of BTC stimulated companies from other businesses to enter Bulgarian telecommunications market. Cable TV operators started to offer cable Internet and now are moving to deliver triple play service – TV, Voice (IP telephony) and Internet. Also utility companies started delivery of voice and data transfer using the infrastructure that they already have built for other purposes. The answer of BTC was the introduction of a long awaited ADSL and a severe defense of this new monopoly. A new opportunity to improve communication services will open when HDTV licenses will be tendered.

As a result of the competition between BTC and alternative telecoms, almost 30% of the population already has access to the Internet. These results would be much better if the state worked proactively to create a real competition in the area of fixed telephony.

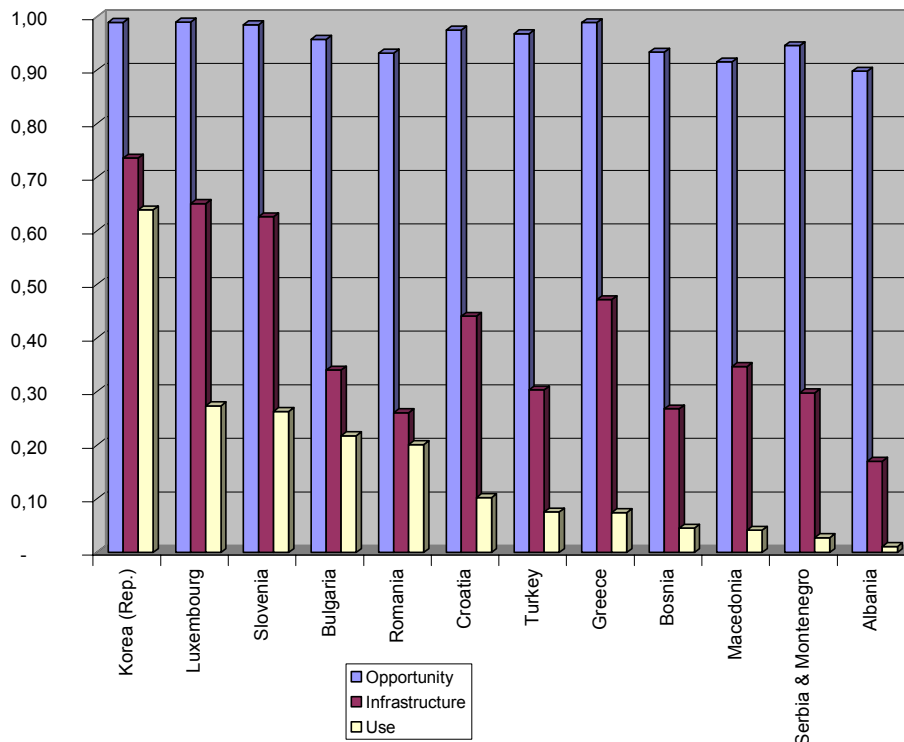
Figure 3: Mobile DOI ranking versus Fixed DOI ranking in the SEE countries

Country	GDP Rank	DOI Rank	Mobile DOI Rank	Fixed DOI Rank
Korea (Rep.)	37	1	1	1
Luxembourg	1	18	17	18
Slovenia	34	22	8	27
Greece	30	42	23	48
Croatia	51	45	40	44
Bulgaria	80	46	49	43
Romania	78	53	58	58
Turkey	70	58	54	63
Macedonia	89	63	60	78
Serbia & Montenegro	83	70	65	74
Bosnia	101	75	74	70
Albania	99	97	72	102

Source: ITU/KADO

It is clearly seen that the development of mobile communications contributes to a better DOI ranking in all SEE countries, excluding Bulgaria and Bosnia. Historically, fixed communications were very well-developed in Bulgaria. Currently, 83% of households have a land line phone. More than 46% of these phone lines are digitalized (in Sofia and other big cities – up to 80%). With the penetration of mobile phones, some of households have decided to give up fixed telephony. Mobile operators are planning to deploy fixed telephony services. BTC acquired license and launched the third mobile operator Vivatel last year. It is expected that the quality of land lines will improve with the competition and that with the lowering of prices, its fixed DOI ranking will improve. Most of the new fixed telephony service providers are expected to use VoIP.

Figure 4: DOI components - digital opportunity utilisation



Source: ITU/KADO

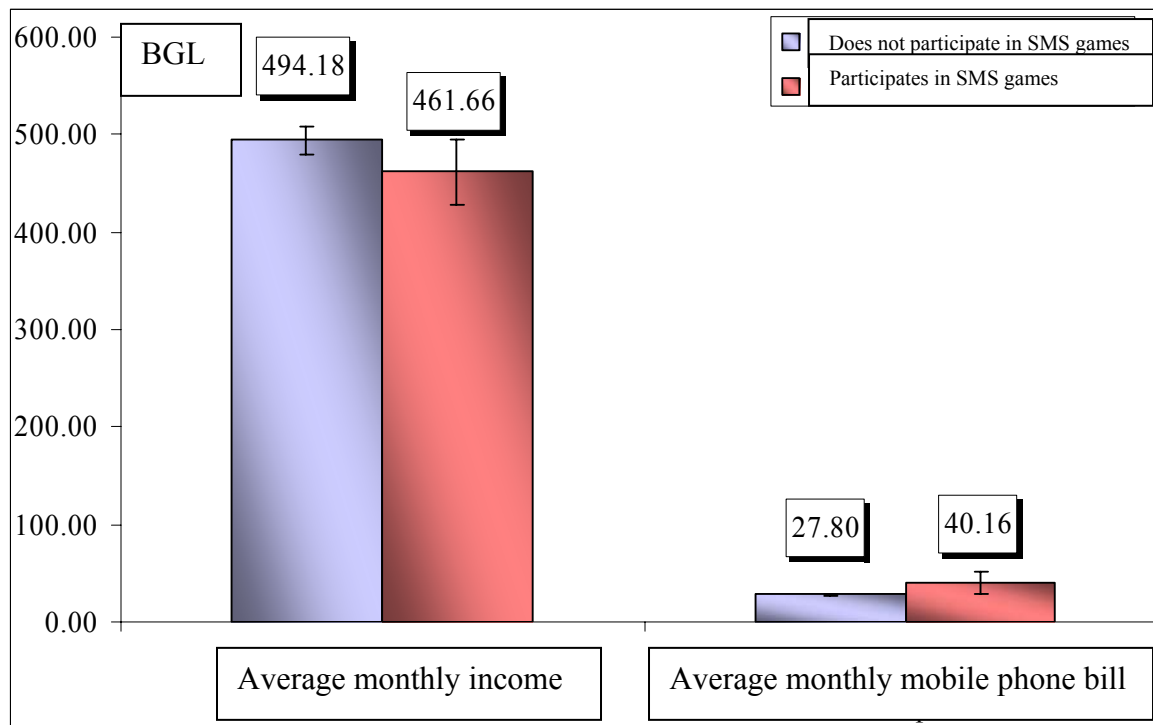
The opportunity to have access to ICTs is widely in place. The affordability and geographic coverage of ICTs in all countries in SEE are close to that of the leading DOI or GDP countries. Infrastructure is still comparatively under-developed, however, in Bulgaria and some other countries in the region. Slovenia, Greece and Croatia have relatively well-developed infrastructure, but their utilization of existing opportunities and infrastructure is relatively low. Bulgaria and Romania (like Korea) use their existing infrastructure better and more than other countries in the region. In Bulgaria, there is strong demand from businesses and citizens to use and develop the infrastructure. Still, the monopoly in telecommunications remains a major impediment for further development of infrastructure and internet usage. Government policies that stimulate the

use of computers, Internet, telecommunications, and e-services should result in improvement of DOI.

Mobile Services

Mobile communications were priced relatively highly, with a limited list of services. With the entrance of a third mobile operator, the picture started to change rapidly - prices went down and the available services were enriched. Therefore, one can expect that the Mobile DOI ranking of Bulgaria will improve in the future.

Figure 5: Average monthly income in Bulgaria and average monthly mobile phone bill - \$1 is approximately equal to 1.5 BGL



Source: Vitosha Research, 2006.

Higher mobile phone penetration creates new business opportunities. For example, the range of value-added SMS services available is constantly expanding. Over recent years, SMS games and/or voting became an important part of many TV shows and deliver a high profit margin. The price of an SMS for a game varies between 30 cents and \$1.5 without VAT, while the price of a regular SMS is 7-10 cents. The number of participants in SMS games is estimated to be around 230,000 or 10.9% of all subscribers using SMS.

Motivation for sending value added SMS-s is mostly financial, because every game promises fast and easy rewards. The average monthly mobile phone bill of a regular SMS games participant is more than 1.5 times higher than the average monthly phone bill of a non-participating person. At the same time, the average monthly income of participants is lower than the average monthly income of non participants. The lower living standard could be seen as a reason for SMS gambling.

Figure 6: Bulgarian mobile phone users dynamics

Year	Prepaid		On contract	
	Number	%	Number	%
31.12.2004	3 085 348	65%	1 644 383	35%
30.06.2005	3 444 324	66%	1 783 965	34%
31.12.2005	4 188 801	67%	2 055 892	33%

Source: Commission for Regulation of Communications.

Most of the mobile phone users in Bulgaria prefer prepaid services. This proportion is growing over the time. This is a clear indication of the high price sensitivity of customers. They perceive mobile services as overpriced and do not want to enter in a long term (usually 1 or 2 years) relationship with an operator with a fixed payment plan. Expectations are that the prices will go down and users want to take advantage of the best (lowest) price. Prepaid services allow low income citizens to use mobile phones without commitment and are one of the main reasons for the growth of usage of mobile phones in Bulgaria. Bulgaria is rapidly closing the gap with EU countries in the area of mobile phone penetration. Over just one year (Fig. 7), the gap narrowed from 25% to 12%. From 2007 portability of phone numbers is planned to be introduced in Bulgaria. It is expected to induce changes in mobile operators' market shares that will result in better conditions for mobile service subscribers. Lower prices and increased subscription base will improve DOI.

Figure 7: Mobile phone penetration in Bulgaria and in European Union

	Bulgaria	EU-15	EU-25
31.12.2004	61 %	86%	83%
30.06.2005	67%		
31.12.2005	80%	92%	91%

Source: Commission for Regulation of Communications.

Mobile services in Bulgaria brought in just under 55% (about \$750 million) of the total revenue from telecommunication services in 2005. Mobile services like data transfer, internet access etc. are marginal with unbearable high prices – up to \$3.5 for 1MB of data transfer using GPRS (with a speed of 33.6 kbps it can hardly compete with the land line transfer) and \$2 using conventional CSD transmission at 9.6 kbps. Services like EDGE (mobile data transfer at up to 236 kbps) finally started in August 2006 at the same price like GPRS. But still, one can see only advertisements for improved value, rather than real improvements in the financial terms and conditions for such services.

The entrance of the third mobile operator Vivatel (owned by BTC) in November 2005 resulted in a 50% decrease of the prices of mobile telephony, although Vivatel gained only 3% of the mobile subscribers by the end of the year. At the same time, services have not advanced considerably in terms of their technology, since 2004/2005. Even MMS is rarely used. There are a lot of phones with MMS capability, but the price of a MMS is 30-35 cents while the SMS price is 7-10 cents. On the other hand, mobile operators do not advertise MMS widely and there is no viable business model to exploit this service. The mobile operator Mtel launched 3G services at the beginning of the year, but the effect is hard to evaluate yet.

The state opened a tender for radio-frequency licenses in the 3.5GHz range. Licenses are for the “point - multiple points” networks using WiMAX technology. Characteristics of the technology make it a viable alternative of the optical cable. It is a good solution for locations where laying optics is expensive or difficult. If the WiMAX services are priced at affordable rates, its deployment will improve the mobile DOI by increasing the number of internet and broadband internet subscribers.

e-Government Services

In 2003, the Bulgarian government adopted an e-Government strategy. Following EU policies, 20 groups of administrative services (8 for businesses and 12 for citizens) were prioritized for deployment as e-Government services by the end of 2005.

Figure 8: e-Government Services

Service Category	2003	2004	2005
To Citizens (12 types of services)	43.9%	58.0%	47.06%
To Businesses (8 types of services)	34.0%	43.0%	80.56%
Total (20 types of services)	39.4%	51.0%	58.65%

Source: CCICMT, e-Government Report, December 2005.

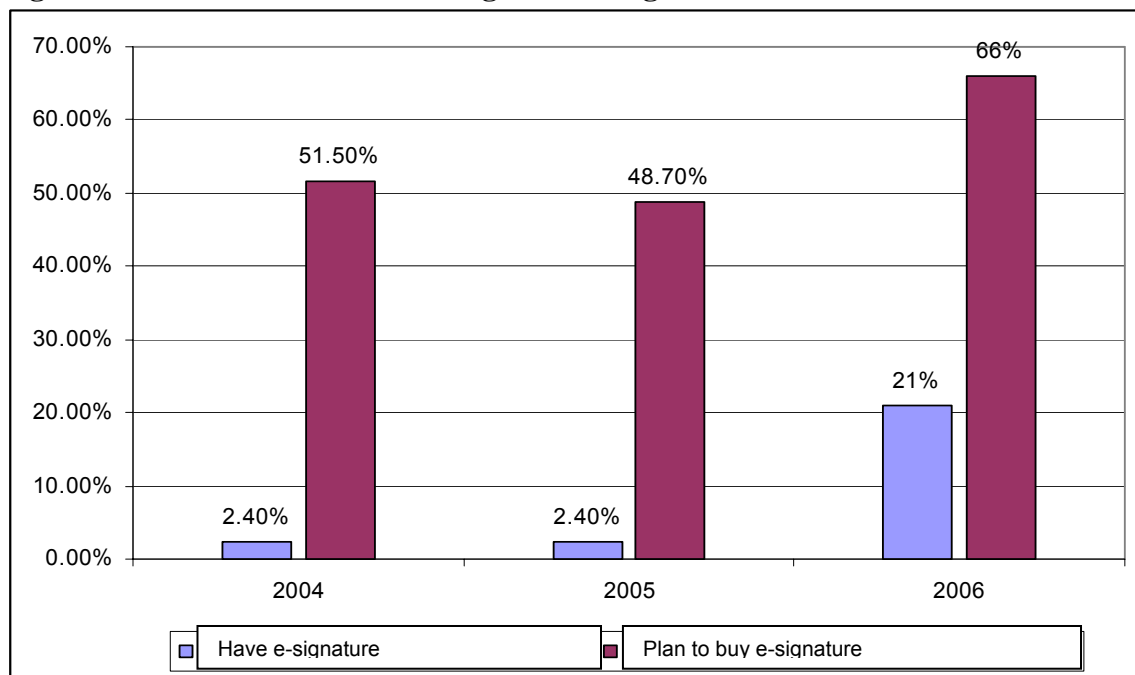
In 2005, the provision of 8 on-line priority services for the business increases to 80.6%, from 43% in 2004. According to the Tax administration, in June this year, 25,000 companies submitted their VAT documentation signed electronically using Internet. This is 25% of all Bulgarian companies that are VAT-registered. For the first 6 months of 2006, almost 2000 payments of taxes and social security contributions were paid to National Revenue Agency over the Internet.

By November 2005, 9 of these services were fully available – 5 for citizens and 4 for businesses. At the level of local government, a few successful projects had been completed. The good practices of the Varna, Stara Zagora, Dobrich, Yambol and Gabrovo regions could be very helpful for the development of other regions in Bulgaria. Provision of administrative services from central and local governments through Internet could lead directly to an increase in the DOI, because citizens and businesses will have economic incentives to buy PCs and to connect to the Internet – saving time, money and troubles.

People and businesses need to have electronic signature (an electronic certificate) to be able to use the 20 services provided by the state administration. At the beginning of 2006, already 21% of the companies owned electronic signatures. The motivation is to save time and hassles in communications with the state administrations – tax administration and National Social Security Institute. Benefits of the use of electronic signatures defused criticism from skeptics from 2003 and 2004. At the beginning of 2006, the hardcore of skeptics remain only at about 10% - mostly companies that have not invested in computers and/or Internet access.

Universal electronic signature (as defined in the law of electronic document and e-signature) is applicable only to administrative services provided by the government. Therefore, the Ministry of State administration and Administrative Reform purchased this year more than 2000 electronic signatures. In the B2B and B2C segments currently the universal electronic signature has no use. One of the reasons is that the court does not recognize it as a tool to sign contracts electronically. The trade legislation still recognizes only contracts on paper and oral agreements, but not electronically signed ones. A step forward is the use of electronic certificates for user identification in online banking.

Figure 9: Business and electronic signature usage



Source: Estat, January, 2004, February-March, 2005 and Alfa Research, January, 2006.

Access to Computers and Internet

About one third of the population in Bulgaria had access to a computer at the beginning of 2006. Kids play a key role for computer penetration in the households. There is a PC in almost 40% of the households with children, while only 13.5% of the households without children own computers. The tendency will hold also in this year – 11% of the families with children plan to buy PC versus only 3% of households without kids.

The expected growth in the household computerization might not automatically lead to increase of connection of these PCs to the Internet. For example in some locations LANs and cable TV are not widely available.

According to a survey conducted by the Center for Control and Quality Assurance of Education at the Ministry of Education and Science, in January 2006 among 900 11th grade students, 58.5% claimed to have a PC at home. It turns out that the share of the students with computer at home is the highest in Plovdiv, and lowest in Sofia.

In another survey conducted by Vitosha Research among the 10th grade students, more than 80% of the respondents claimed to use the Internet. At the same time, the share of Internet users in different types of schools is almost the same. This is evidence that the school type and the perceived better school ranking are not essential for the students' access to the Internet. New technologies are a priority in communication between youngsters, but not a kind of extravagance.

Figure 10: Locations where people use computers

	<i>IV 2000</i>	<i>IX 2000</i>	<i>VI 2001</i>	<i>X 2001</i>	<i>V 2002</i>	<i>X 2002</i>	<i>V 2003</i>	<i>VII 2003</i>	<i>X 2003</i>	<i>X 2005</i>
At home	2,6	4,4	5,3	7,5	4,8	5,2	6,2	6,5	6,9	19,8
At work	6,3	7,5	7,2	7,0	9,1	7,3	8,5	8,3	7,9	13,3
Other place	3,1	2,1	6,5	4,1	2,5	2,5	6,1	7,3	7,7	8,0
Respondents over 18 years old	<i>1161</i>	<i>1158</i>	<i>1066</i>	<i>971</i>	<i>1170</i>	<i>1079</i>	<i>1107</i>	<i>1054</i>	<i>1098</i>	<i>948</i>

Source: Vitosha Research.

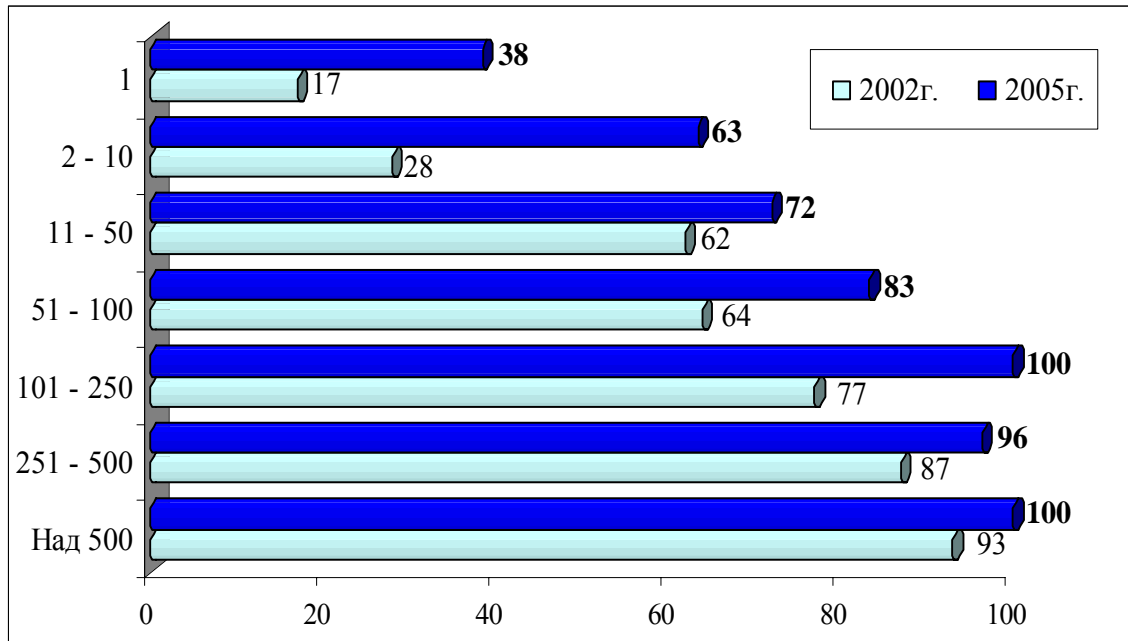
It is worth mentioning that alternative places to get Internet access are Internet cafés, schools, universities, friends, etc.

According to a national representative survey of Vitosha Research conducted in December 2005, 17% of the population in Bulgaria above 18 years has access to computer at the job. 9.1% of population uses computers linked to the Internet at their everyday work, but only 1.6% of Bulgarian citizens above 15 years shop on-line.

Companies in Bulgaria understand how important it is to be connected. There is a significant growth in the number of companies linked to the Internet, spatially for the small ones. Larger numbers of companies understand that Internet is not only another

line of communication, but also a sales and marketing platform, particularly in the global economy.

Figure 11: Businesses with Internet access



Source: Vitosha Research.

The number of companies with less than 10 employees with Internet access has increased each year over the last two years and reached 62% in 2005. Companies with 51 to 100 employees linked to the Internet amounted to 83% in 2005. Almost all companies with more than 100 employees were connected at the end of 2005.

The share of the companies that sell their products and services to other companies using Internet market places increased from 12.2% in 2004 to 19% in 2005.

Figure 12: Broadband access

Per cent of households or individuals with broadband access to the Internet	10,6 %
Per cent of companies with broadband access to the Internet	44 %
Per cent of public administrations with broadband access to the Internet	100 %

Source: Vitosha Research

Broadband Internet access achieves a larger and larger penetration. 100% of the state administration has broadband connections, while only 10.6% of households have broadband access.

How do individuals use the Internet? - Most use it to download/listen music, to browse the Internet, and download/watch movies. Games and Internet games are also popular.

Figure 13: How people use computers at home

Activity type	Use of Internet %	Average weekly usage %			
		Up to 8 h	8-21 h	21-40 h	More than 40 h
Music listening	60,3	62,4	19,7	4,1	13,8
Internet (browsing)	54,3	60,3	15,3	8,1	16,2
Watching movies	53,7	73,7	20,4	5,8	0,0
Games	48,1	80,9	12,8	4,7	1,6
Chat, e-mails, Internet phone calls	43,8	73,5	15,3	7,8	3,4
Study related (school, university), job related	40,1	56,9	14,2	14,1	14,8
Processing of photos and videos, digital imaging	16,4	89,1	6,7	4,2	0,0
Software development/Web design	8,4	15,5	24,8	0,0	59,7
CAD, computer arts	6,7	44,4	23,2	16,3	16,0
Others	7,7	71,2	19,9	8,9	0,0

Source: Vitosha Research.

It is interesting to mention that more than 8 % of users work intensively in software development. Almost 60% percent of them spend more than 40 hours per week. It is an indication that these people work remotely in most of the cases on international software development projects.

More than 40% of the users use home computers for education purposes or for job-related activities. One can assume that most of the people spending more than 20 hours per week in front of their home computer are doing this to earn money and/or to improve their knowledge/qualification.

Figure 14: Household Internet access

	(11.2004)	(10.2005)
Dial-up (phone and modem)	22.7	15.2
Leased line	3.1	5.3
Cable modem	52.7	36.9
Mobile phone	1.3	2.2
LAN	13.7	25.8
ADSL	2.9	4.2
Total broadband access	72.4	72.2
Don't know – No answer	3.6	10.3

Source: Vitosha Research.

In October 2005 the share of home users with a broadband Internet access reached 10.6% from the whole population (or more than 70% of Internet users at home). This is almost

22% growth in comparison with the previous year. The percentage is close to the average of 10.8% in the EU in July 2005. There are differences in broadband definitions. In this article, dial-up and Mobile phone Internet access does not constitute broadband. Although in Bulgaria, the broadband access is closed in the LANs or in the territory of the country, international access speeds are limited and there is a definitely clear tendency for decrease of dial-up.

Another survey in Sofia, conducted by Gfk Bulgaria, shows that about 60% of households in Sofia have Internet access and more than 35% of the households without Internet access are planning to connect. Most often 45% of subscribers use LAN, 38% - cable modem and only 8% dial-up connection.

Conclusions

- ◆ DOI can be used as an instrument to measure the efficiency of the governments' policies to develop the Information Society.
- ◆ Working to improve DOI will result in higher rates of GDP growth because ICT services provide higher added value.
- ◆ Almost all technical innovations are available in Bulgaria
- ◆ Needs and innovativeness of businesses and individuals combined with open competition are the driving force for development of Information Society.
- ◆ In the state and local administrations there are islands of excellence but the political will of the ruling majority is essential for the success of e-Government initiatives.

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