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Quantitative Estimates of the State of the Information Society in Bulgaria

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In the last decade the concept of the information society (IS) gained wide currency related most of all to the intensive usage of the information-communication technologies (ICT) in all spheres of production, services and social practice.

The development of the IS as a whole and of the ICT in particular became a prime task for many governments because the level of them determines to a great extent the innovative potential and the state of the economy of every country.

Being a country in transition and also as a candidate for membership in the European Union (EU) Bulgaria is obliged to realize considerable reforms in the whole socio-economic structure. The results from these reforms depend considerably on to what extent the country has made a progress in building the contemporary information society.

During the past years lots of indicators were suggested and tried that allowed some qualitative estimates about the information society as a whole and about some sides of it in particular. The valuation of the information society in Bulgaria will be based on the following three indicators [2, 3, 4].

1. Technical certainty indicator (TCI). It reflects the proper production for the ICT branch and also the condition of the resources that are used to realize this production. In this indicator there are integrated five most widespread partial indicators of the technological production: personal computers (PCs), mobile phones, INTERNET-hosts, faxes and TV sets.

The methods for estimation of the influence of every such indicator is elaborated, tested and successfully used by R o d r i g u e z, W i l s o n [2] from the University in Maryland (USA). The proof of the reliability of the technical certainty indicator (TCI) also belongs to them.

In accordance with these methods TCI is calculated for more than 150 countries. For comparability with Bulgaria the present paper includes six countries with different degrees of TCI: USA, Ireland, Bulgaria, Romania, Russia and Pakistan. The range of

variation for the indicator is from zero up to one hundred; the maximal value is assigned to USA.

Table 1 contains the TCI data of these six countries. The leftmost column is the rank of the countries and the rightmost one – the TCI indicator. The other columns resent the five specific indicators. In accordance with the ranks and the TCI indicator the chosen countries are ranked as follows: USA, Ireland, Russia, Bulgaria, Romania and Pakistan.

Table 1

Rank	Country	TV sets per 1 000 men	Faxes per 1 000 men	PCs per 1 000 men	Internet hosts per 10 000 men	Mobile phones per 1 000 men	Technical certainty indicator (TCI)
1	USA	808.38	55.28	320.23	293.92	116.40	100
21	Ireland	365.63	23.65	156.14	54.20	53.91	40.19
53	Russia	380.96	0.34	16.50	2.84	0.95	11.93
58	Bulgaria	329.03	1.32	17.46	3.00	3.00	11.18
74	Romania	205.84	0.71	4.86	1.78	2.04	6.44
96	Pakistan	47.90	0.80	3.05	0.03	0.34	1.62

2. Indicator for transparency of communications (ITC). It is proposed by the National Science Foundation (NSF) of USA [3]. It is determined based on the estimate for bleakness of the organizations' activity and also for the level of interactive reciprocal action between them.

This indicator is intended for estimation of the public and local self-government and it shows the usage of ICT first of all by the executive. ITC depends to some extent on the TCI indicator.

Table 2 includes data about the ITC values for the same countries from Table 1. The leftmost column contains the ranks of the respective countries ranked according to the increase of their meanings. The ranks are related to the position of any country in the total of the compared countries. The rightmost column contains the respective meanings of the indicator for transparency of communications (ITC) according to the level of decrease of its values.

Table 2

Rank	Country	Total number of national Web sites	Percentage of ministries with own Web sites	Average transparency of ministries	Average interactivity of ministries	Sum of indicators for transparency and interactivity	Indicator for transparency of communications (ITC)
4	Ireland	26	1.00	11.50	5.00	16.50	16.50
6	USA	205	1.00	10.33	5.64	15.96	15.96
63	Pakistan	29	0.75	3.50	0.00	3.50	2.63
74	Russia	6	0.20	6.00	2.10	8.10	1.62
76	Bulgaria	2	0.20	5.50	2.00	7.50	1.50
84	Romania	13	0.12	5.50	1.00	6.50	0.75

The remaining five columns contain the meanings of the respective indicators: total number of the national Web sites, percentage of ministries with own Web sites, average transparency of ministries, average interactivity of ministries and sum of the indicators for transparency and interactivity.

Due to the generalized ITC values the countries are ranked in the following way: Ireland, USA, Pakistan, Russia, Bulgaria and Romania. There is some difference in the ranking of countries in Tables 1 and 2 but the first countries are one and the same and they lead for the TCI and ITC indicators tearing away from the other countries.

3. The World Times publishing house and the IDC company have jointly elaborated an index of the information society (ISI) to determine the state of the information society [4]. It ranks the rates of growth and usage of ICT and also the state of the information society as a whole. It allows the estimation also of the participation of every country in the realized information revolution taking under consideration the global processes in ICT and in the economy as a whole. This index points to some frames to determine the possibility separate countries to access and use ICT. About 20 variable values are reported grouped in four divisions: information infrastructure, social infrastructure, computer infrastructure and infrastructure based on INTERNET.

The ranks of the six compared countries are shown to the very left in Table 3. The rightmost column of the same table contains the values characterizing the state of the information society according to the degree of their decrease. In [4] there are cited data from just 55 countries with sufficiently ample information and therefore it is not advisable directly to compare the ranks from Table 3 with the ones from Tables 1 and 2.

Table 3

Rank	Country	Indicator for the state of the information society
4	USA	5.850
20	Ireland	4.202
34	Bulgaria	2.154
35	Romania	2.097
40	Russia	1.863
55	Pakistan	0.955

If the investigated countries are distributed in four groups [5]: first – with ISI indicator values above 4.5, second – from 2.5 up to 4.5, third – from 1.5 up to 2.5 and fourth – up to 1.5 then according to Table 3 USA are in the first group, Ireland – in the second, Bulgaria, Romania and Russia – in the third, and Pakistan – in the fourth.

Table 4 presents generalized data for the three indicators from the previous tables. The ranking in this table is the same like in the previous Table 3.

Table 4

Rank	Country	Indicator for technological certainty		Indicator for transparency of communications		Indicator for the state of the information society
		Rating	Value	Rating	Value	
4	USA	1	100.00	6	15.96	5.850
20	Ireland	21	40.19	4	16.50	4.202
34	Bulgaria	58	11.18	76	1.50	2.154
35	Romania	74	6.44	84	0.75	2.097
40	Russia	53	11.93	74	1.62	1.863
55	Pakistan	96	1.62	63	2.63	0.955

In [5] there is a correlation analysis of the data from the first three tables and it follows from it that the correlation coefficient between the TCI and the ITC is equal to 0.623, between the ITC and ISI indicators is equal to 0.678 and between the TCI and the ISI indicators is equal to 0.947.

From here the corollary follows that the technical certainty influences the information society to a greater extent than the transparency of communications.

If we use the data from the "Global Competitiveness Report" of the World Economic Forum [1, 6] then we may determine the generalized indicators (the ranks) of Bulgaria concerning respectively the microeconomic competitiveness, the competitive growth and the computer literacy followed by a comparison with the position which this country occupies according to the indicators of the information society.

Table 5 contains the ranks (positions) of six countries, Bulgaria included among the other countries respectively for competitive growth, microeconomic competitiveness and computer literacy. It follows from the same table that according to the last three indicators Bulgaria occupies respectively 75th, 59th and 67th positions. The comparison with tables 1 and 2 leads to the conclusion that for the transparency of communications and the technical certainty the position of the country is respectively 76 and 58, i.e. approximately the same as in the case with the macroeconomic indicators in Table 5. Therefore it is possible to state that concerning the quantitative estimates about the state of the information society Bulgaria is ranked almost in the same position as in the case with the indicators of the competitiveness of the economy.

Table 5

Country	Generalized indicator (rank) of competitive growth	Generalized indicator (rank) of microeconomic competitiveness	Generalized indicator (rank) of computer literacy
USA	2	1	1
Finland	1	2	3
Croatia	61	72	48
Turkey	66	52	56
Romania	63	56	61
Bulgaria	59	75	67

Based on the data from Table 1 up to Table 5 it is possible to draw the following most general conclusions:

Bulgaria is slow concerning the state of the information society, competitiveness and computer skills occupying for these indicators from 59th up to 76th positions. It lags behind not only the developed countries but also behind a series of poorly developed countries. It is right behind Romania.

Evidently it cannot develop successively in the European Union if this trend does not turn in a positive direction.

The arrear is terribly unpleasant and strategically dangerous in computer skills and in the state of the information society – a domain with better indicators as long as 10-15 years ago.

It is possible that this arrear might have distant consequences – it is no less dangerous than the arrear in the competitiveness of economy because the state of ICT directly determines the innovative potential and the very economy for every country [7]. Following the optimistic scenario the medial indicators of the countries with mem-

berships in the EU will be possible after about a dozen of years; the pessimistic scenario requires twice as much and even more time.

It is evident that the steps of the Bulgarian state administration for improvement of the computer skills and also of the information society indicators are quite insufficient. But much more upsetting is the reluctance of the Bulgarian business to invest in the ICT development such resources that will be adequate to the public ones. This is defined by some objective reasons which must be revealed and overcome because only the joint efforts of the state administration, the private business and the nongovernmental organizations are able to realize a turning point in such an important area.

A catching-up strategy in the state of the information society and of the ICT is realizable if first of all respective decisions are made on a high national level andd the most important is the necessary will for their realization.

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Количественные параметры состояния информационного общества в Болгарии

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(Резюме)

На основе международно принятых количественных параметров определяется состояние информационного общества Болгарии и его место среди таких обществ других стран. Отмечается значительное отставание Болгарии по сравнению с рядом других стран в отношении состояния информационного общества, информационно-коммуникационных технологий и компьютерных умений. Даются рекоммендации по уменьшению этого отставания с помощью государства и бизнеса.