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Information for Development Program (infoDev)

National Academy of Sciences of Belarus
Belarusian Fund of Informatization

ICT Infrastructure and E-Readiness Assessments in the Republic of Belarus

Grant # ICT 015

E-Readiness Assessment Report

April 2003

Minsk

LIST OF RESEARCHERS

1. Victor I. Dravitsa, Contact Person of the Grant –	Belarusian Fund of Informatization
2. Uladzimir V. Anishchanka Deputy Contact Person, Coordinating Group executive –	United Institute of Informatics Problems, National Academy of Sciences of Belarus
3. Vladimir V. Basko –	IT Companies Association
4. Yury I. Vorotnitsky –	Belarusian State University
5. Sergey V. Yenin –	NGO "Information Society"
6. Yuriy A. Zisser –	TUT.BY Belarusian Portal (Reliable Software Co.)
7. Alexander N. Gorbach –	State Center of Information Security
8. Valery E. Kratenok –	Ministry of Health
9. Leonid V. Semenenko –	Institute of Applied Physical Problems
10. Oleg I. Tavgen –	Academy after Degree Education
11. Vladimir A. Labunov –	Belarusian State University of Informatics and Radio Electronics
12. Nikolay I. Listopad –	Ministry of Education
13. Alexander N. Kurbatsky –	Association "National Infopark"
14. Gennadiy P. Chepurny –	Ministry of Economics
15. Boris N. Panshin –	National Centre of Marketing and Price Study
16. Michael M. Makhaniok –	National Centre of Information Resources & Technologies, National Academy of Sciences of Belarus
17. Artour I. Savitsky –	Belarusian Fund of Informatization
18. Ivan A. Korol –	Ministry of Labour and Social Assurances
19. Anatoly L. Rodtsevich –	Ministry of Industry
20. Anatoly N. Morozevich –	High Attestation Committee
21. Michael M. Kovalev –	National Bank
22. Oleg F. Seklitsky –	RA "Beltelecom"
23. Oleg T. Manaev –	Independent Institute of Socio-Economic & Political Studies in Minsk, Belarus
24. Alexander V. Karymov –	Translation
25. Valentina I. Galko –	Account support
26. Artyom U. Anishchanka –	Software support
27. Dmitry L. Mozneyko –	Software support
28. Aliaksandr U. Chekan –	Software support
29. Katsiaryna V. Kurian –	Translation, English edition

ABSTRACT

The report comprises 144 pages, 19 references, 88 tables, 66 figures, 1 annex.

INFORMATION AND COMMUNICATION TECHNOLOGIES, NETWORK ACCESS, NETWORK LEARNING, NETWORKED SOCIETY, ELECTRONIC COMMERCE, TELECOMMUNICATIONS REGULATION, INTERNET, PERSONAL COMPUTERS, WIRELESS TELEPHONY, ELECTRONIC READINESS, INFORMATIZATION PROGRAM, ELECTRONIC BELARUS.

The object of research is the sector of information and communication technologies (ICTs) of the Republic of Belarus by network access, network learning, networked society, networked economy, network policy.

A purpose of the research is to carry out a comprehensive combined assessment on the basis of actual data of the advancement of Belarusian community in most critical ICT usage fields and in its most relevant applications by using the international methodical guidelines [1-3] to reveal weak points in the development of informatization processes in the Republic of Belarus.

During research the analysis was made regarding:

- Information infrastructure, stage of Internet Availability and Internet affordability;
- Network speed and quality of the information transfer while accessing the Internet;
- Hardware and software availability and service and supports for ICTs;
- Schools' / education institutions access to ICTs and enhancing education with ICTs;
- Developing the ICT workforce and ICT employment opportunities;
- Remote on-line access to organizations and locally relevant content of information resources;
- Level of using ICTs in everyday life and in the workplace;
- Developing electronic commerce and electronic government;
- Telecommunications regulation and ICT trade policy.

As a result of research a detailed description or a detailed charted map of ICT potential of the Republic of Belarus, as a point of reference in ICT development planning has been obtained.

CONTENT

Introduction

Ever-evolving and increasingly powerful information and communication technologies (ICTs) have fundamentally changed the nature of global relationships, sources of competitive advantage and opportunities for economic and social development. Technologies such as the Internet, personal computers and wireless telephony have turned the globe into an increasingly interconnected network of individuals, firms, schools and governments communicating and interacting with each other through a variety of channels. The explosion of this technologically mediated global network has resulted in a world in which virtually everyone, everywhere, has the potential to reap the benefits of connectivity to the network. Success in the Information Age depends upon the widespread integration of ICTs into society-at-large.

The new ICTs are a powerful yet neutral tool that can be used to address a host of issues in every community – their real power, therefore, lies in their ability to support holistic development that promotes long-term social and economic benefits. If information and communication technologies are used effectively, they can help to create a trained, educated and healthy workforce that can build a vibrant and successful economy.

The value of a network increases as its number of users grows. By participating in the global information network, developing nations not only add value to the rest of the world, but also benefit from the ability to use the network to communicate and trade with all other users.

For this reason it becomes ever more important for the Republic of Belarus to get ready for the Networked World.

Readiness to face such world creates new opportunities for organizations and individuals in the countries with transitional economy, lifts barriers, which have been traditionally an obstacle to information and goods flows from CIS countries, and also promotes activity efficiency.

The involvement in the networked world may provide for new ways for Belarus in terms of improving economical and social welfare and political well-being. These opportunities for positive changes become even more essential and are accessible due to an increase of ICT capacities and reduction of its service rates.

The welfare of the countries in a modern world is determined in many aspects by a stage of development of a country's informational infrastructure and the level of penetration into all publicly-significant areas of human activity by the advanced ICT. In this respect, a necessity to carry out an trustworthy expert assessment of the ICT infrastructure and estimate readiness to use up-to-date information technologies in all fields of the society vital activities is gaining special importance for each country.

"The Information Readiness" or e-Readiness is a level, which a community reached and is prepared to integrate into the informatively networked world. It is assessed by estimating advancement of the community in most critical fields for ICT usage and in its most relevant applications. Such assessment grounded on the said elements, provides a clear description of E-readiness of the community by considering it jointly in a context of the discussion about strategic planning.

National Academy of Sciences of Belarus (NASB) was vested with power of a republican state management body by the Decree of the President of the Republic of Belarus (Decree No7 dated March 5, 2002) headed «On improving governmental management in the field of science», which is concerning its specific functions, including that of providing support and facilitate development of informatization and a scientific and technical information system.

Set-up and development of ICT in the republic according to priority guidelines is envisaged for the years of 2001-2005 within the framework of some already approved or pertaining approval programs, namely State Programs of Basic Research, Programs of the Community (Belarus-Russia), State R&D Programs (SRDPs) and Branch Scientific and Technical Programs as below:

1) State Program of Informatization in the Republic of Belarus for 2001-2005;

2) Intellectual Information Technologies and Systems Program of the Community (Belarus-Russia) for 2003-2005 (is not approved);

3) Development of model family of high performance computing systems with parallel architecture (supercomputers) Program of the Community (Belarus-Russia) for 2000-2003;

4) Development and use of space means and technologies of reception, processing and display of the space information for 1999-2002 and Development and use of perspective space means and technologies in interests of economic, scientific and technical development for 2003-2006 Programs of the Community (Belarus-Russia);

5) Protection of the common information resources of Belarus and Russia Program of the Community (Belarus-Russia) for 2000-2003;

6) The state program of basic researches "Theoretical bases of new information technologies for 2001-2005";

7) SRDP "Advanced information and telecommunication technologies" (Information Technologies) for 2001-2005;

8) SRDP "Development of methods and tools of complex information protection system (Information Protection) on 2001-2005;

9) SRDP "Complex Informatization of Belarus public health services" for 2003-2012 (is not authorized);

10) The state branch scientific and technical program "CAD/CAM technologies of new production for 2001-2005;

11) The state branch scientific and technical program "Telecommunication Tools" for 2001-2005;

12) The program of works on Development of the Research and Information Computer Network (NIKS) of Belarus for 2001-2003;

13) The Communication Development Program in Belarus on 2001-2005 (with scientific maintenance).

Belarusian Informatization Fund has already carried out tentative assessments of ICT infrastructure in state sector while elaborating and implementing the above-listed programs as well as while tackling and solving the matters pertaining to Year 2000 Problem of in the Republic of Belarus.

Methodology. The e-readiness assessment report is a tool to identify strategic priorities of the Republic of Belarus in order to integrate into a networked world. The present studies and research has been carried out by using officially approved and advised international methodologies to estimate a networked readiness to obtain comprehensive reports and derive appropriate conclusions for taking effective decisions related to fostering development processes of informatization in the country. To collect first-hand primary data about ICT situation in Belarus, two questionnaires were elaborated with reference to methodologies of Harvard University's Center for International Development:

1) Readiness for the Networked World. A Guide for Developing Countries [1];

2) CHAPTER 2: The Networked Readiness Index: Measuring the Preparedness of Nations for the Networked World [2].

The goal of the assessment is to evaluate the rating of information infrastructure development in Belarus and its readiness to integrate to the networked world. The assessment would serve as a basis for developing the National Action Plan for introduction of modern ICT solutions aimed at fostering socio-economic development of Belarus, and be used as a guide for national and international organisations in the area of E-Development.

The assessment according to [1] measure 19 different categories *(sub-indexes)*, covering the availability, speed, and quality of network access, use of ICTs in schools, workplace, economy, government, and everyday life, ICT policy (telecommunications and trade), ICT training programs, and diversity of organizations and relevant content online. All this data were processed in a way to ensure comparability with the similar data for the countries assessed in the Global Information Technology Report 2001-2002: Readiness for the Networked World [2].

An 'e-ready' Belarusian society is one that has the necessary physical infrastructure (high bandwidth, reliability, and affordable prices); integrated current ICTs throughout businesses (e-

commerce, local ICT sector), communities (local content, many organizations online, ICTs used in everyday life, ICTs taught in schools), and the government (e-government); strong telecommunications competition; independent regulation with a commitment to universal access; and no limits on trade or foreign investment.

To collect additional items of information a third questionnaire was used, with the said questionnaire containing questions formulated according to some variables approved for an estimation in the course of implementation of e-Europe program [3].

To ensure that a trustworthy assessment of the state of an ICT infrastructure and e-readiness in Belarus has been made, the information was collected from various sources, which follow:

- ad-hoc on-line poll at site TUT.BY (1759 participants);
- members of the Republican non-governmental Information Society (60 questionnaires);
- comprehensive training institutions and regions departments of educational (68 questionnaires);
- higher educational institutions (10 questionnaires);
- Internets Service Providers (9 questionnaires);
- participants of 4th Belarusian Internet forum by2002 under title «Internet for Business Benefit», November 29-30, 2002 (36 questionnaires);
- members of Belarusian non-governmental associations of the IT companies and National Infopark;
- republican state management bodies (ministries, committees, etc.);
- publications in mass-media and Internet databases;
- the national public opinion polls conducted by the Independent Institute of Socio-Economic & Political Studies, Minsk, Belarus (1,500 respondents of age 18+ were face-to-face interviewed, marginal error did not exceed 0.03).

A comprehensive combined assessment carried out on the basis of actual data by using the international methodical guidelines [1,2] has allowed to reveal weak points in development processes aimed at informatization in the Republic of Belarus with regard to the following combined variables (see results in Parts 1-5):

1) Network Access;
2) Networked Learning;
3) Networked Society;
4) Networked Economy;
5) Network Policy.

The basis of data of 5 combined indexes (component indexes) shows the estimations which measure 19 different categories of indicators (indexes) ranging each index by levels of advancement from 1-st (least-advanced) to 4th (most-advanced). These categories are interdependent, each one influences other category by a definite way. The approach has been accepted, comprehending the situation that it is inappropriate to focus efforts at one field of ICT alone in the country, but it is essential to pay attention to each of them. It is then marked where, among different categories, proper efforts ought to be exerted.

Network Access (see results in Part 1). A defined total assessment of the readiness stage by Network Access component index (Table 1.39) shows, that the capital of the country (20% of the population) has actually reached 3rd stage of development according to ICT indexes taken into account, whereas the regions and other areas are found to be at 2nd stage.

Networked Learning (see results in Part 2). A defined average estimation of e-readiness level/stage by Network Learning Component Index is 2.76. However, the present estimation differs essentially for comprehensive schools and high schools, actually by one level/stage: 2.37 and 3.16, accordingly. This practically means, that higher educational institutions have reached 3-rd level of development as assessed by the ICT indexes taken into account, whereas the comprehensive schools are at 2nd level.

Networked Society (see results in Part 3). A defined average estimation of advancement level/ stage by Networked Society component index is 2.44. However, the present estimation differs essentially for regions and Minsk, almost by one level/ stage: 2.22 and 3.19 - respectively. It means, that 3rd level/stage of development as assessed by the ICT indexes taken into account, was practically reached in Minsk, whereas the regions are at 2nd level/stage only.

Networked Economy (see results in Part 4). A defined average estimation by Networked Economy Component Index is 1.97. It means actually that the country has not achieved 2nd level of development according to ICT e-readiness indexes. The given estimation is low even for Minsk - 2.57, not to mention the regions - 1.86.

Networked Policy (see results in Part 5). A defined average estimation by Network Policy Index is 1.91. It means actually that the country has not achieved 2nd level of development according to ICT indexes.

The Networked Readiness Index (NRI) [2] transforms the complex dynamics of Networked Readiness [1] into more easily understood quantitative shorthand. NRI (see Part 6) distinguishes factors that determine the usability of the Network (the Enabling Factors) and variables that reflect the extent of Network Use. The Belarus NRI data sources fall under three general categories. First, we collected a variety of measures—mainly "hard" variables but also some "soft" ones—from sources such as the World Bank, the International Telecommunications Union, Freedom House, and the Business Software Alliance. Second, we drew heavily on questionnaire responses from about 50 participants of Fourth Belarusian Internet Forum (November, 29-30 2002) and Belarusian experts of the grant # ICT 015. Third, in the course of research being carried out currently within the framework of *infoDev* grant 11 "hard" variables were received as a result of special research and analysis of data that is absent in statistical reports of either the Belarusian governmental bodies, or the international organizations.

The defined Belarus Networked Readiness Index is 3.19 (Table 1) that equals to rank 61 from 76 countries according to [2]:

Country	***Networked Readiness***	***NRI Rank***
United States	6.05	1
Iceland …	6.03	2
United Kingdom …	5.31	10
Czech Republic …	4.38	28
Lithuania …	3.59	42
Belarus (2002) ...	*3.19*	*61*
Russian Federation …	3.17	62
Ukraine …	3.05	67
Nigeria	2.10	76

Table 1

Belarus Networked Readiness Index

Key Facts	
Population	9,980,000
GDP per capita (PPP)	US$ 1,120.-
Main telephone lines per 100 inhabitants	30,50
Telephone faults per 100 main telephone lines	35,21
Internet hosts per 10,000 inhabitants	57,39
Personal computers per 100 inhabitants	7,77
Piracy rate	87 %
Percent of PCs connected to Internet	7,39 %
Internet users per host	15,8
Internet users per 100 inhabitants	9,07
Cell phone subscribers per 100 inhabitants	4,54
Average monthly cost for 20 hours of Internet access	US$ 21.45
	Rank
Networked Readiness Index	**61**
Network Use component index	51
Enabling Factors component index	65
• **Network Access**	**67**
Information Infrastructure	67
Hardware, Software, and Support	63
• **Network Policy**	**73**
Business and Economic Environment	66
ICT Policy	76
• **Networked Society**	**51**
Networked Learning	66
ICT Opportunities	66
Social Capital	26
• **Networked Economy**	**65**
e-Commerce	64
e-Government	72
General Infrastructure	47

Thus, the research resulted in that a comprehensive charted map showing a detailed description of a Belarusian potential in ICT, as a point of reference in ICT development planning was obtained. The draft assessment report data were appropriately used while elaborating the State program of informatization in the Republic of Belarus headed «Electronic Belarus - *e-Belarus*» to be implemented within the years of 2003 to 2005 and till the year of 2010.