

UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

**TOWARDS A
KNOWLEDGE-BASED ECONOMY**

BELARUS

COUNTRY READINESS ASSESSMENT REPORT



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UNITED NATIONS

New York and Geneva, 2002

ECE/TRADE/311/6

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Printed at United Nations, Geneva (Switzerland)

UNITED NATIONS PUBLICATIONS
Sales No.
ISBN

FOREWORD

The last decades of the 20th century have represented a turning point in the global development process. It is knowledge that has become the engine of the social, economic and cultural development in the today's world. Knowledge-intensive economic activities are now a factor of production of strategic importance in the leading countries. They have also become the main indicator of the level of development and the readiness of every country for a further economic and cultural growth in the 21st century. Taking into consideration all these factors, the United Nations Economic Commission for Europe has launched an initiative of monitoring and analyzing the development of the knowledge-based economy in all the European countries in transition and emerging market economies.

The major goal of this initiative is to stimulate the exchange of national experiences, to identify best practices and to promote region-wide and global-wide cooperation of the UNECE member States, which would accelerate the development of a knowledge-based economy in the countries in transition and emerging market economies. It envisages the preparation of country assessment reports on the biennium basis by national experts, nominated by the Governments, the creation of a High-Level Task Force on the Knowledge-Based Economy, which will consider the reports and provide policy advice and recommendations to the participating countries, and the development of progress measurements and indicators, policy guidelines and tools to assist countries in overcoming obstacles to the development of a knowledge-based economy.

We hope that the country assessment reports, showing a detailed level of the countries' potential and providing information on various approaches and solutions, will help policy-makers to take strategic decisions with regards to the challenges facing them in the development of institutions, information and innovation systems, human resources development and other areas crucial for the development of a knowledge-based economy.

*Brigita Schmögnerová
Executive Secretary
United Nations Economic Commission for Europe*

Over the last two decades, the on-going processes of economic, social and cultural transformation have been accelerated by the unprecedented powerful impact of information and communication technologies. This has created unique opportunities for an effective development of the State and the business sector, the economy and politics, the civil society and the citizen.

The pace of adaptation of new information technologies and the utilization of their potential and possibilities in accelerating the economic development vary throughout countries, generating new sources of inequality in the world. It is because of that, a new initiative of the United Nations Economic Commission for Europe to create a system of monitoring of the development of information and communication technologies and knowledge-intensive economic activities is worth of the most high appreciation. The proposed methodology of preparation of national assessment reports by national experts will allow to provide a snapshot of their development in each concrete country. A comparative analysis of country assessment reports, in its turn, will allow to determine the degree of diffusion of new technologies in each and every country and to develop a set of strategic measure of harmonization.

In conclusion, I would like to thank the initiators of this large-scale project and, especially, Ms. Brigita Schmögnerová, Executive Secretary of the United Nations Economic Commission for Europe.

With all respect,

N. Zaichenko

First Deputy Minister
Ministry of Economy
Republic of Belarus

PREFACE

The industrial revolution of the 19th century and the scientific revolution of the 20th century have prepared the conditions for the rise of the knowledge-based economy. Economic activities associated with the production and utilization of information and knowledge have become an engine of economic growth in the developed market economies, increasingly transforming all the other dimensions of development and the entire societal *modus vivendi* and *modus operanti* of the humanity.

What do we mean by “the knowledge-based economy”?

It is not just the digital economy, which incorporates the production and use of computers and telecommunication equipment. It is not quite the networked economy, which incorporates the telecommunication and networking growth during the last decades and its impact on human progress.

The knowledge-based economy is a much complex and broader phenomenon. There are different dimensions and aspects of the knowledge-based economy:

1. The knowledge-based economy has a very powerful technological driving force – a rapid growth of information and telecommunication technologies (ICT). Every three – four year there appears a new generation of ICT. Today, the ICT companies are among the largest corporations. The ICT sector is among the fastest growing economic sectors.
2. Telecommunication and networking, stimulated by a rapid growth of ICTs, have penetrated all the spheres of human activity, forcing them to work into an absolutely new mode and creating new spheres. The information society has become a reality.
3. Knowledge, based on information and supported by cultural and spiritual values, has become an independent force and the most decisive factor of social, economic, technological and cultural transformation.
4. The knowledge-based economy has allowed a quick integration of the enormous intellectual resources of economies in transition into the European intellectual pool, stimulating the development of the former countries. Every country can benefit from developing a knowledge-based economy to become a more equal participant in the global development process.
5. The emerging knowledge-based economy has been affecting other areas of societal activity in every country, including institutional and innovation system, human resources development and etc. and visa versa. The knowledge-based economy has become an engine of progress in every country. If a country is developed, it has a developed knowledge-based economy, if a country is lagging behind, a knowledge-based economy constitutes just a small fraction of its economy.

The report below was prepared by a national expert, nominated by the Government, and represents an overview of the present situation and an assessment of the emerging trends in all the major areas, constituting the foundation of the knowledge-based economy, such as policy and policy instruments, institutional regime, ICT infrastructure, information system, national innovation capacities and capabilities.

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Introduction

In the last twenty years the world has seen global changes resulting from an explosion in information and communication technologies (ICT). While transforming information processing and intensifying information exchange, ICT influence extends to all spheres of human activity and creates unique opportunities for rapid and efficient development of states, economies, political relations, societies and peoples. ICT has given rise to a new infrastructure, on which the world economy's global character is now based.

The global information infrastructure has dissolved geographical and geopolitical borders, and changed economies and the activities of the mass media. It greatly exceeds traditional sources of information. It has become the means of information exchange as well as the environment in which business, investments, financial transactions, and advertising, etc. take place. Together with natural, financial and human resources, information is now, in itself, of strategic value to states. It also plays an increasingly significant role in decision-making. The scale of information industry markets (microelectronics, telecommunications, computer and radio) has grown steadily, and it is now comparable, in terms of value, with the scale of natural resource markets.

ICT has produced opportunities for global competition and for the multinational development of industries. It has widened the scale of finance and trade, strengthened economic links and expanded markets. Global competition has provided new stimuli for economic development; for improved productivity and product quality; and for encouraging innovations and their dissemination.

ICT forms the basis of an economy's networked organisational capability where achievements of science, technology, information and knowledge are consolidated into one environment. This environment generates advanced technologies, information and knowledge, making the latter a productive force. Knowledge-intensive professions will demand a greater dissemination of ICT. Qualified scientific, engineering and executive staff are at the core of the professional structures being formed around this field.

In the Republic of Belarus a planned, systematic strategy to capture the opportunities provided by ICT for sustainable economic development has not yet been devised. Currently, the use of ICT is primarily of a technical nature and is aimed at developing information systems, strengthening telecommunications infrastructure and providing Internet access. The influence of ICT on the national economy has not been studied practically. This report will allow the country to determine its existing national ICT potential and its readiness for operating in the framework of the global economy. It will also allow it to develop a set of measures aimed at using ICT to enhance the productivity and competitiveness of the Belarusian economy.

1. National strategy and action plan

The Republic of Belarus is a country whose economy is in transition and whose economic structure is both industrial and informational in character. Forecast trends for the year 2020 predict a decrease in the share of employees in manufacturing industries (from 28 to 25%), and in agriculture (from 14 to 12%). Meanwhile, the rate of growth of non-manufacturing businesses is lower than that of developed countries, and the share of employees in this sphere is expected to total 10%.

Forecasts for the economic development of the Republic of Belarus are worked out in accordance with the law: “On state forecasting and programmes of socio-economic development of the Republic of Belarus”.

On the basis of the aforementioned law, the Ministry of Economy has developed “Main Directions of the Socio-economic Development of the Republic of Belarus for the Period up to 2010”, approved by the Government in April 2000, and “Programme of the Socio-economic Development of the Republic of Belarus for 2001-2005”, accepted by the 2nd All-Belarus Peoples Assembly on 18 May 2001.

The Programme envisages stable average annual GDP growth of 6.2 to 7%; an increase in the share of non-manufacturing businesses in GDP from 40 to 42%; and a decrease in the share of agriculture from 12.7 to 12%. There are plans to increase investments up to 3.5 to 4 billion US dollars.

In the period under consideration a significant increase in demand for modern informational services (telecommunications, Internet, e-mail, etc.) is expected. To this end there are plans to:

- renovate the information and telecommunications infrastructure;
- expand Internet access;
- develop information and telecommunication technologies;
- stimulate the manufacture of ICT supporting products.

Great importance is given to the development of market infrastructure – the securities and commodities markets - as well as to the development of technological stocks, innovation centres, advanced technologies, and knowledge-intensive manufacturing. An acceleration of the development of services related to the marketing of knowledge-intensive products and to small-scale innovation businesses, is also envisaged.

The main goal of state policy regarding informatisation is the establishment of an integrated informational space for the Republic of Belarus. This will be the basis of the country’s socio-economic, political and cultural development, ensuring its national security, and its entry to the global information community. In accordance with the main provisions of the Concept of State Policy on Informatisation (approved by Presidential Decree in 1999), the period 2001 to 2005 should see the continuing development of the legislative basis for the establishment of the information society, a build-up of accessible national information resources, and the stable development of the information infrastructure and telecommunication systems.

A list of the informatisation projects and funds for their implementation are specified in the national programmes “State Program of Informatisation of the Republic of Belarus for 2001-2005” and “Advanced Information and Telecommunication Technologies”. Additionally, there are a number of regional and branch programmes. In the aforementioned programmes, primary attention is given to:

- the development of the national information system;
- the development of information systems for governmental bodies;
- the building of national information resources;
- the provision of a normative and methodical approach to these issues.

Implementation of these programmes will result in: more effective and better decision-making; availability of some of the state information resources to the business sector; and an enhanced technological level of telecommunication services.

As yet, there has been no elaboration of a detailed state ICT strategy to support technological advancement and competitiveness of the national economy or for an ICT strategy to assist those branches of industry and entities exposed to global competition. This competition is often based on state-of-the-art technologies and maximises opportunities granted by ICT.

In Belarus, the role of ICT as a foundation for economic development, social organisation and interaction with the global economy, is currently underdeveloped. Inadequate attention is given to ICT’s potential to: increase the efficiency of market institutions; boost the efficiency of business and trade; maximise national economic productivity and competitiveness; and promote integration into the global economy.

At present, the competitiveness of the Belarus economy is limited due to:

- its inability to switch to high-technology and high-production activities or to produce goods and services that meet world standards;
- the absence of flexibility and a developed infrastructure to enter global markets.

As a result, national goods and services are currently not in demand by foreign markets. The state, however, is keen to support technological development of the national economy and infrastructure to ensure enhanced global competitiveness. New information and communication technologies will be the primary instruments for developing a system in Belarus competitive in the global market-place. The appropriate employment of ICT in goods and services production will boost competitiveness and thereby promote Belarus as a more effective participant within the global economic system. Belarus should make efforts to build a new technological and economic system based on recent ICT advancements as well as facilitating the use of advanced technologies, information and knowledge for the well-being of its people.

2. The institutional regime

The Republic of Belarus is a unitary democratic social state respecting the rule of law. In accordance with Article 8 of the Constitution, the country recognises the priority of generally acknowledged principles of international law and assures the conformity of its legislation with them.

In Belarus, the exercise of state power is divided between the legislative, judicial and executive bodies. The legislative body is the Parliament consisting of two houses – the Chamber of Representatives and the Council of the Republic. Judicial power belongs to the courts, and control over the accordance of legal acts with the Constitution is exercised by the Constitutional Court of the Republic of Belarus. Executive power in the republic is exercised by the Government – the Council of Ministers being the central body of state administration.

The key elements of state administration are ministries which are the governmental bodies that pursue state policy and authority. These act as the primary bodies of state policy in various spheres of public life. The present system of governmental bodies is determined by the Presidential Decree № 282 of 3 June 2002. Governmental bodies number some 40 ministries, state committees, and committees. The system of Belarus is comparative to that of other countries.

The Ministry of Economy is the key ministry directing and implementing the state's policy in the economic arena. It executes management of and control over the development and implementation of state socio-economic policy and coordinates the activities of other governmental bodies in this sphere. The Ministry of Economy effects regulation and management of state property and privatisation, support of small and medium-sized businesses, and general co-ordination of the state investment policy. Currently, two documents provide the overall planning framework for Belarus; these are “Main Directions of the Socio-economic Development of the Republic of Belarus for the Period up to 2010” and “Programme of the Socio-economic Development of the Republic of Belarus for 2001-2005”.

The Ministry of Industry implements state policy on the development of the national industries. The industrial sector amounts to about one third of national economic production. Knowledge-intensive branches are well developed and include: the radio industry (more than 70 enterprises, research and technological institutes); the electronics industry (16 enterprises and seven design and technological bureaus); optical and mechanical industry (more than 10 enterprises); and instrument engineering (five enterprises).

State policy in the sphere of science and innovation is coordinated by the State Committee on Science and Technology under the Council of Ministers of the Republic of Belarus. State support is implemented through state, branch and regional research and development programmes. In the period 2002 to 2005, more than 40 state programmes and 120 innovation projects have been planned and will be implemented. In the last five years, the science related component of GDP has been maintained at 0.8-0.9 per cent although in 2005 there are plans to increase this to 1.8 per cent. To increase efficiency of the state support of scientific activities, three specialised funds have been established and are operating.

The Ministry of Communications and Posts is responsible for state policy on the development of telecommunications. The document “Programme of communications development for 2001-2005”, approved by the Council of Ministers in 2001, provides the overall direction and

planning framework for the telecommunications sphere. This Programme also determines the preparatory steps for, and implementation of, liberalisation of the telecommunication market. The Programme also specifies the required investments and their potential sources to finance the process. The relevant funds for 2002 amount to 109 billion rubles (innovation fund – 47.8 billion rubles and amortization – 61.2 billion rubles).

The Ministry of Education bears responsibility for the state regulation of education. The education structure includes; 4757 primary and secondary schools with a total enrollment figure of 1546.5 thousand pupils; and 377 colleges and 43 higher education establishments with a total enrollment figure of 245.1 thousand students.

State policy in the sphere of informatisation is carried out in the accordance with the Law “On Informatisation” and “State Programme of Informatisation of the Republic of Belarus for 2001-2005”. Top-priorities are identified as: development of the telecommunications infrastructure; building up national information resources and ensuring their availability; and research and productive capacity building. To coordinate these activities, a Committee on Informatisation was envisaged although, currently, it is not established and such activities are carried out independently by relevant governmental bodies. Some issues are coordinated by the Interagency Commission on Informatisation, which was established by a 1998 Presidential Decree along with the Informatisation Fund.

3. Present situation and trends in country's informational system

At present, Belarus possesses advanced information and communication technologies, it has high R&D capability and it has recognised intellectual capacity. The country has the ambition to build an information society and integrate itself fully into the global information community.

The immediate goal is to build an integrated national informational space as the basis of socio-economical, political and cultural development and national security. Several state laws provide a comprehensive policy framework in the field of informatisation. These include laws on: “Informatization”; “State Secrets”; “The Basics of State Research and Development Policy”; “Standardization”; and “Certification”.

The State plays a number of roles which include:

- the building and use of information resources;
- the facilitation of informatisation processes;
- the stimulation of new technologies, systems and networks;
- provisions for communication system development;
- specification of the powers of governmental bodies on the issues of informatisation;
- regulation of relations in the informatisation sphere through investment, tax and fiscal policy.

State informatisation policy started to form in the early 1990s. Its main goal was to provide scientific, technological and economic conditions for the creation and development of ICT, information infrastructure and to encourage the development of national information resources.

Informatisation in three spheres, namely the social, industrial and administrative, were recognised as a priority by the “Programme of Informatisation of the Republic of Belarus for the Period of 1991-1995 and up to the Year of 2000”. During the course of this programme, information systems in statistics, science, education, medicine, social protection industrial management, and state administration, were introduced. Additionally, the telecommunications means to support a national information system and for the provision of Internet access were developed intensively.

Due to limited funding, however, the Programme was not implemented fully and the funding shortages were compounded by a lack of coordination and continuity between responsible government bodies. The project has not been implemented systematically. The main goals of the Programme – increase in decision-making quality, speed, economic efficiency, and quality of information services – has not been achieved.

Development of the telecommunications infrastructure was more successful. It was implemented within the framework provided by the “Program of the Development of Communication Means in the Republic of Belarus up to the Year of 2000”. Within the national network of data transfer “BELPAK”, 18 regional switching centres providing dial-up

and leased-line Internet access were established. Traffic capacity of the external Internet channel was increased up to 44 Mbps and 32 ISPs started to operate.

In the “Programme of Communication Development for the Period of 2001-2005” priority is given to development of the information infrastructure for a communications network, based on advanced technologies and including: establishment of collective Internet access sites; development of distance learning; electronic trade; and telemedicine.

In the “Program of Informatisation for the Period of 2001-2005” planned activities include: establishing a national automated information system; development of an informatisation infrastructure; and provision of automated information systems for governmental bodies. Activities for the development of computer networks such as UNIBEL (designed for the Ministry of Education and created with the technical assistance of the UN), BasNet (National Academy of Sciences) and NIKS (research and development computer network) will be continued. The joint Russian-Belarusian Program “Development and Serial Production of Supercomputers and Their Use for the Creation of Firmwares” will be also implemented.

In the immediacy, it is planned to continue the development and introduction of information technologies for e-trade to serve both the national and international markets.

4. Characteristics of the country's human resources

From 1994, Belarus began to experience depopulation resulting from mortality rates exceeding birth rates. These demographic change stemmed from a deterioration in peoples' health due to a sharp decrease in living standards, ecological problems, and a decrease in quality and accessibility of medical services.

As of 1 January 2001, 9,990,400 people lived in Belarus of which 1,992,000 thousand people were under 16 years, 5,872,400 were at a working age, and 2,126,000 were over the working age. The total number of employees was 4,441,000 thousand. 57.2% of this number worked in the state sector and 42.8% worked in the private sector. The share of employed in the non-manufacturing sphere amounted to 29.9%, and the total number of unemployed amounted to 95,800 people.

As many as 41.2% of employees graduated from higher educational establishments and colleges. This significant percentage of employees with higher educational qualifications has resulted in a misbalance between those professionals coming into the job market and the availability of suitable positions. The job market is subject to significant inertia and is uncompetitive. This results in under-utilisation of qualified members of the labour force.

The structural reform underway in Belarus is aimed at increasing economic efficiency. Reform, inter alia, will include: priority development of competitive sectors; running down of inefficient sunset industries; transfer of productive assets to the development of new knowledge-intensive and high-technology sectors; and strengthening of market structures. The aim of the reform process is to boost the number of high-tech jobs and couple this with systematised re-training of personnel to fit the new profile of the jobs market.

During 2001 to 2005, it is planned to improve structures supporting personnel training. The following programmes will facilitate this process: Concept of the State Personnel Policy; Programme of Development of Higher Education in Regions; Concept and Programme of Occupational Guidance of the Youth; Programme of Development of National Information Computer Network for Educational System; and a Programme of Post-Graduate Education Development.

The enhancement of structures to support personnel training assumes the creation of a flexible qualification system. In addition, there is a need for several supporting developments which include: an overhaul of the processes to introduce new professions and specialities into higher education and colleges; new educational models; and an expansion in the number of students.

Heightened scientific capacity is required if the innovation path adopted by Belarus is to flourish. The negative trends of recent years, in which there was a sharp decrease in the total number of workers in the scientific sphere, has now reversed. In 2002, the total number of workers in research institutions amounted to 32,900 people and the total number of scientists working in the educational sphere came to 20,000. Of the total scientific population of Belarus, there are about 3,800 doctors of science.

The intensive development of ICT requires a highly-qualified human resource pool to support the process of informatisation.

More than 1,082,000 pupils (70 per cent of the total number) learn the basics of computer literacy and programming. There are 2,500 teachers serving the country's computer science needs.

Qualified ICT personnel are graduates of educational establishments which, amongst others, include: the Belarusian State University of Radio Electronics and Informatics; the Belarusian State University; the Belarusian National Technical University; and the Minsk Radio Technological College.

Graduates are employed in 93 scientific-industrial centres, as well as research and design institutes of the radio and electronic industries. Organisations include: the Research Institute of Electronic Computers (development of computer systems and networks); the Minsk Industrial Amalgamation of Electronic Computers (production of personal computers, servers, communication means); and the Scientific Industrial Amalgamation "INTEGRAL" (producing about 60% of world demand in integrated circuits for timepieces).

More than 100,000 qualified specialists are estimated to be working in the informatisation sphere although there is no confirmed statistical data available.

5. National innovation capacities, capabilities and their effectiveness

The main goal of the national information policy is to modernise the market via the introduction of advanced domestic and international technologies to boost competitiveness and productivity through the integrated use of the latest ICT. To achieve the goals of the national information policy it is necessary to:

- ensure state support of research in priority ICT areas;
- improve conditions for technology development and uptake;
- integrate science and education more effectively;
- boost the effectiveness of personnel training for scientific and other knowledge-intensive industries;
- create favorable conditions for competition in research and innovation;
- improve legislative protection of intellectual property rights;
- promote closer international cooperation.

A Presidential Decree (8 June 1996) specified key measures to stimulate the establishment and development of advanced technology production centres. As part of this process, the Government approved 27 priority measures including: information technologies and electronics; quantum optics; and nanotechnologies. This process will encourage high-tech local developers and will strengthen national export capacity.

A Decree of the Council of Ministers dated 1 February 2001, approved the list of state research and development programs for 2001-2005. The main goals of these programmes are to foster technological innovations and to ensure success of complete innovation cycles. Research into electronics, computer and fiber-optic technologies, software, telecommunications, robotics, information services, biological and chemical technologies will become an element of the state research process. For the period up to 2005, 32 national programmes, seven branch programmes and six regional ones, are to be developed.

Particular emphasis will be placed on product quality. In accordance with the Programme “Quality” for 2001-2003, systems of state standardisation, certification and metrology are to be further developed. By 2005, the objective is to increase the number of enterprises working under ISO 9000 standards up to 250.

The development of framework conditions to stimulate company innovation is now under way. There are several critical goals, namely: improve the coordination of technical re-equipment in all branches of the economy; increase efficiency of investments; promote other measures which stimulate the market; and ensure state support of the innovation process. Particular attention will be paid to entrepreneurial innovation, including: supportive infrastructure for innovative small businesses; provision of services to encourage innovation; and the introduction of technologies to boost innovative approaches to management. It is planned to develop further the network of technology and innovation centres, and to establish

a network of technology transfer centres, drawing on the resources of the largest educational establishments and industrial enterprises.

The planned activities will encourage new forms of organisation and will stimulate both production and innovation, particularly within free economic zones and designated innovation centers. Four special funds for the support of R&D and innovation have been established. Innovation supporting funds are being established by several ministries and administrative organisations. Their resources are to be used for industrial re-equipment and the provision of research and development and design activities.

Funding for R&D and innovation is limited, a factor which undermines both scientific developments and their competitiveness. The rate at which an appropriate frameworks to promote innovation are being created is low. Foreign investors are wary because of high economic risks, mistrust, inactivity of banks and other financial institutions, and credit interest rates.

Estimates predict that by 2005 the knowledge-intensity of GDP will amount to 1.8% and, if achieved, this will enable a doubling in funding for research and development activities and a significant increase in funds for development of a more effective scientific base. It will also allow a more effective procurement of equipment, as well as increased payment levels for scientific staff and experts.

Special attention will be given to the training of qualified specialists for all spheres of research and development activities with hopes for a 10.4% rise in the total number of researchers by 2005 compared with 2001. The total number of doctors of sciences will grow by one third.

For scientific establishments, the strengthening and development of both material and technical bases will be carried out in line with the Programme of re-equipment of scientific establishments for 2001-2005.

In 2001, 529 patents for inventions, 264 utility patents and 104 design patents were registered.

The national telecommunication infrastructure is being strengthened. In 2002, it provided potential Internet dial-up access for 75% of the population. At the same time, communication lines are state-owned. The state monopoly allows it to fix high tariffs for both ISPs and the population. This limits active use of the Internet and undermines its potential. High tariffs hinder Internet use within educational establishments and discourage distance learning. E-trade has recently begun to develop, and possible approaches to e-government are currently being explored.

The software and communication markets have developed dynamically, offering a broad range of goods and services at affordable rates. A great deal of hardware and software is imported although a part of this is adapted to local needs. There are above 500 private business entities in these markets.

A step-by-step liberalisation of the telecommunications market is planned with the objective of boosting foreign investment in the sector. This will make it possible to: reduce tariffs and expand the use of ICT and Internet within science, education, industry, and governmental bodies; to further develop the communications infrastructure; and to introduce new methods of work reliant on information resources e.g. the organisation of e-trade.

6. Major national initiatives

High productivity and competitiveness are the determining factors for the success of Belarus' economy in a globalising economic system. In their turn, these factors are determined by: technological innovation; the ability of a society to switch to high-technology production; the ability to produce goods and services of sufficient standards for world markets; and the ability to ensure their distribution.

At present, the international competitiveness of Belarus' economy is limited by the lack of goods and services meeting world standards and, furthermore, the lack of an effective distribution infrastructure serving international markets. Goods produced in Belarus do not penetrate international markets because of their poor quality and this is compounded by a lack of marketing and distribution capabilities.

New information technologies are key instruments in a system of heightened global competitiveness. The penetration of sophisticated production information and ICT systems into the manufacture of goods and services are a good indicator of current and future production capabilities and competitiveness. Technological adjustment, therefore, is a critical driver of productivity as well as expansion of market share and is the basis of further economic growth.

The state research and development and innovation policies are geared at boosting the competitiveness of domestic goods and services through the promotion of technological change and innovation within companies. Although the country's scientific base and personnel capacity are being strengthened, the infrastructures to promote new technologies being created, and key branches of industry being modernised, there is still not enough attention being given to the need to be competitive in global markets.

The developing information and telecommunications infrastructure enhances both internal and external communication between companies and institutions. From an economic standpoint, however, the new opportunities opened up by the enhanced communications infrastructure are not being maximised. The lack of ICT resources, the low receptivity of many companies to work with advanced technologies, limited knowledge of what is available on the market, and underdevelopment of e-trade, limits the positive impact of the communications revolution in Belarus.

To address this and catalyse greater economic activity stemming from advances in ICT and the Internet, information and marketing-based entrepreneurial networks are planned. The purpose of such networks would be to consolidate scientific and technological advancements, production and trade, investment projects and proposals in a single information environment. The networks would provide information focal points at the local, regional and international levels. The networks will strengthen Belarus' position in the international arena and will be a testing ground for the formation of a new knowledge-based economy.

Conclusion

In the Republic of Belarus, significant state-level attention is given to: the development of science and innovation; the enhancement of the national information and telecommunications infrastructure; the improvement of ICT and Internet uptake in the education system; increasing opportunities for distance learning; and strengthening of the supporting legislative foundation. The state objective is to ensure economic policy which promotes development across the scientific, innovation, educational, investment and social spheres.

As the analysis has shown, Belarus has passed the initial stage of ICT development and at present it is moving to the integration of ICT for the purpose of the state, society and business. However, the introduction and efficiency of ICT are impeded by a range of factors.

The first of these is the high cost of Internet access and related services. The national telecommunications infrastructure is well-developed with about 75 per cent of the population on mainlines and half with a possibility of a dial-up connection to Internet. There are about 100 locations with public Internet access and 47 Internet service providers are registered. At the same time, the state has a monopoly on external communication channels and determines expensive tariffs for Internet access (price of a 64 Kbps leased line is 540 US dollars per month with an average salary standing at 100 US dollars per month). These high tariffs limit the use of Internet in educational establishments and for business purposes. Furthermore, the tariffs hinder the spread of distance learning and e-commerce.

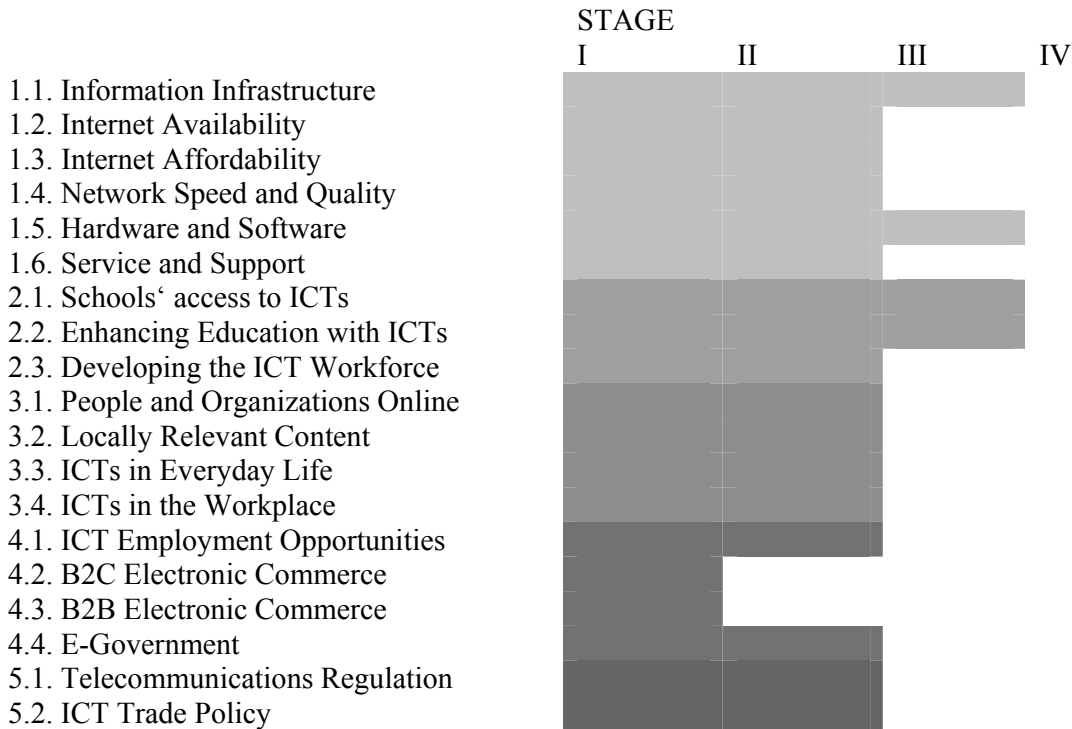
The second impediment is a lack of funds. Belarus has a high scientific potential. Its society is well-educated with a high degree of computer literacy (94% of students are educated to use computers in their work and there are more than 100,000 specialists in the field of computers and telecommunications). At the same time, the speed of ICT introduction and the scale of the use of these technologies are limited, especially for the general public, owing to insufficient funding.

In 2002-2005 the State will sponsor 59 ICT projects, principally for governmental bodies, education and public health, etc. Business and other public spheres of activity will receive less focus. This will limit the export opportunities for Belarusian enterprises and will deter other trade-related and ICT utilising public activities. Foreign investment into ICT is limited due to high economic risks, a weak financial infrastructure, and high interest rates.

To increase the productivity and competitiveness of the Belarusian economy, and thereby facilitate market expansion, increased capital circulation, and liberalisation of the telecommunications sector, a massive investment into ICT is necessary.

The development of an information and marketing network to catalyse all kinds of economic activities benefiting from improved ICT and the Internet, is planned as a pilot project. The network will consolidate scientific and technological advances, production and trade, investment projects and proposals in a single information environment linked at the local, regional and global levels. The network will strengthen the Belarusian position in the world arena and will be the testing ground for the formation of new knowledge-based economy.

Annex I - Benchmarking



1. Information Infrastructure

The greater part of the community in Belarus has good access to telephone services. Density is 30 mainlines per 100 people. Mobile wireless penetration is 2.3%. Cable penetration is 30% of all households, but new cable systems with a possibility of data transfer are installed in 3% of households only.

2. Internet Availability

There are 47 ISPs registered, although only 25 of them operate. ISPs mainly offer local dial-up access. The variety of services is rather limited (e-mail, web-hosting). There are limited opportunities for public Internet access (91 points). In the evening users have some difficulties in establishing a dial-up connection to a local ISP. There is limited competition in commercial leased line provision, owing to monopoly of the state in telecommunication sector. ISPs offer only local lines. Private providers leased lines are not available.

3. Internet Affordability

Rates for ISPs services are high. Dial-up access costs 0,017 US dollars per minute on average. Only a few individuals (less than 1%) can afford Internet access. Some ISPs offer services with lower costs, but the quality of their services is low. Private leased lines are not available. The State leased line prices are 540 US dollars per month (64 kbit/s lines). Such prices are beyond the capacity of small businesses.

4. Network speed and quality

80-90% of domestic telephone calls are successful. Users have access to dial-up modem transfer speed of up to 32.6 kbps (in urban areas), 13.2 kbps (in rural areas). Leased lines with transfer speed of up to 64 kbps (ISDN) are available for business and ISPs in big cities only. Loss of packets by the network may occur, but it is not generally disruptive. There is a limited

access to high-speed solutions such as DSL, cable modems (optic) and wireless (RadioEthernet, 10 Mbps), but this is seldom used. The possibilities for Internet access from Belarus are limited. Maximum speed is 44 Mbps.

5. Hardware and Software

Most products used by ISPs are of foreign origin, but there is a robust industry engaged in adapting products to local needs. A great deal of software is localised to Russian and Belarusian language. Hardware and software solutions are available and affordable to small and medium sized businesses, and to the majority of population.

6. Service and Support

Total number of telephone units is 2,962,000 thousands. The share of population with home telephone is high and amounts (in urban areas) to 90%. About 401,400 people are on the waiting list to install a mainline. Once the decision to install is taken, it takes a few days to install a mainline. Reported problems are usually solved within 48 hours. There are sufficient numbers of hardware technicians, web designers and network administrators.

7. Schools' Access to ICT

About 74% of schools at all educational levels have computers labs. An average number of computers per laboratory is between five to 15. Computer labs are generally opened for studies all day and are closed in the evening. Access to computers is ensured for all students. Computers are usually represented by 386/486/Pentium models, and in most cases networks with a file server are available. About 4% of schools have access to Internet (1% - dial-up connection, 3% - leased lines such as UNIBEL, NIKS, etc.).

8. Enhancing Education with ICT

Teachers and students use computers to support traditional educational processes. The educational program in high schools includes: programming; work in text processing software, spreadsheets, etc.; searching information on the Internet; and information exchange in networks.

In some schools, teachers organise information on Web servers, using e-mail in practice work. About 60% of teachers of computer science have some special training.

9. Developing the ICT Workforce

There are technical schools with curricula including extensive courses in information and communication technologies and computer science. There are a variety of training opportunities relating to information and communication technologies in educational institutions, and private training centers. Online access to training is limited (owing to its high cost). Distance learning courses are beginning to be developed.

10. People and Organisations Online

More than half of the population has heard about the Internet, and more than 10% have used it. About 3% of the population uses Internet regularly. The majority of Internet users are males between the age of 15 and 35. The number of domains registered locally is 0.2 per 1000 people. Advertising of online companies or resources in traditional media is widespread.

11. Locally Relevant Content

About 2000 local websites are available, though most carry static content and are updated infrequently. Some websites provide dynamic information on local topics and are updated at least several times per week. Local content is generated by business companies. Most websites are available in local languages. The use of online bulletin board systems, Usenet

groups, and newsletters is wide. There are limited opportunities for web-related training owing to expensive Internet access.

12. ICT in Everyday Life

Information and communications technologies (telephone, fax-machines, computers) are used widely by business companies. Only a small number of people use fax-machines and computers in their daily lives (at home). Most social communication is paper-based and oral. A growing number of people use Internet centers, Internet-cafes, etc., where computers and Internet access are available.

13. ICT in the Workspace

Employees have limited access to telephones (on a time basis). Financial expenditure for such purposes is bound by employers. More than 50% of small and big businesses and government offices have computers, many of which have networks. Most business communication is conducted in person via phone or fax. Computers are used for automatisation routine operations, for searching information on the Internet, and for electronic communications. There are low efficiency gains from ICT use.

14. ICT employment opportunities

There are many employment opportunities for technically skilled workers, with opportunities in the electronics industry, in production of computers, communication facilities etc. But salary level in these sectors low and a percentage of workers look for jobs in trade, small business etc. instead.

15. B2C Electronic Commerce

Local businesses have about 4,000 websites (2,000 in Belarus), based inside and outside of country. Most of websites are of an advertising nature. The basic information they provide is static and infrequently updated. Online business is only beginning to be developed and all dealings between businesses and consumers is oral and paper-based via phone and fax.

Annex II – Knowledge-Based Economy Indicators

1. Network Access

1.1. Information infrastructure

- Telephone penetration (number of mainlines per 100 people):
30 per 100 people
- Mobile wireless penetration (%), growth trend:
Mobile penetration is 1% of the population. Growth trend is rising.
- Total number of mobile telephone subscribers:
235, 000
- Total number of mobile telephone subscribers per 1000 people
23 mobile subscribers per 1000 people
- Wireless penetration (percentage of the population)
40%
- Growth trend
Rising
- Total number of cable TV subscribers:
910,000 (105,000 new).
- Cable TV subscribers, % of households:
30% (3% new)

1.2. Internet availability

- Total number of ISP providers:
25 (47).
- Prevailing types of ISPs' networks (microwaves/radio...):
Cable networks
- Percentage of unsuccessful local calls:
Up to 20% at peak hours.
- Is there competition among ISP providers?
Limited
- What are opportunities for public Internet access (libraries, Internet-café, etc.)?
91
- Are there dedicated line lease possibilities? Are there competing providers?
No

1.3. Internet affordability

- What are the prices of Internet access (unlimited access, per minute charge)?
0.0125-0.017\$.
- Is it affordable for the majority (compared with average salary/income)?
Minority. Income is \$0.6/hour average and Internet access is \$1/hour average.
- What are the rates for leasing lines?
\$540/month.
- Are the rates affordable for small businesses or individuals?
Only for big businesses.

1.4. Network speed and quality

- What is the percentage of successful calls?
80-90% (urban).
- What is the quality of voice connection?
Satisfactory.
- How many faults are reported per year for each 100 telephone mainlines?
N/A.
- How long does it take to clear faults (48 hours, a week, month)?
48 hours.
- Which services are supported by local telecommunications infrastructure: e-mail, high-speed modem connection, what is the maximum speed?
E-mail, web-hosting, high-speed modem connection – up to 1,2 Mbps.
- Are there sufficient backbone facilities/networks? Even for peak demand?
Facilities are limited (maximum speed for Belarus networks is 44 Mbps).
- What is the percentage of packet loss by the network?
10-20%

1.5. Hardware and software

- Are there local IT hardware/software sales points?
470.
- Is the price of IT hardware/software affordable for majority/minority of citizens/businesses?
For minority of citizens and majority of businesses.
- Is there software available in local languages?
Belarussian and Russian.
- Is software imported or adapted locally? (Percentage of the imported, adapted, produced locally hardware or software in total number in circulation)
The majority of software is imported.
- Is there a broad variety/some/very few software business applications?
Few.
- Are the IT software/hardware retail and wholesale markets competitive and vibrant?
Yes.

1.6. Service and support

- How long is the waiting period for telephone line installment? (Total number of those on the waiting list; waiting period: days, weeks, months, years)
Waiting period of one month.
- How long is the waiting period to repair reported telephone line problems? (Minutes, hours, days, etc.)
48 hours.
- Are there software developers, web designers, network administrators and other technical personnel, and how many (working where, employed/unemployed)?
Approximately 40,000.

2. Networked Learning

2.1. Access by schools to ICTs

- Are there computers in schools? How many students per computer? On which level (university/secondary/primary)?

41 students per computer (on average)

Number of schools	4,574
Number of computers in schools	More than 30,000
Number of schools with computer labs	3,385
Number of computers per school	Average of 10
Number of students	1,276,000
Students per computer	41
% of schools with computer labs	74%

- Who has access to computers (technical staff/faculty/students)?
Students/teachers.
- What is the quality of hardware (386/486/Pentium...)?
386/486/Pentium – 50%
Original models – 50%.
- Are there LANs in schools? Regional WANs? National school networks?
Belarussian school networks: UNIBEL/NIKC.
- Do schools have connection to the Internet? Is it dial-up or through a leased line, wireless?
4% schools have connection. 1% is through dial-up and 3% through leased line (local).

2.2. Enhancing education with ICTs

- What is the percentage of students and teachers who use computers? (Universities/primary schools/secondary schools)
Primary teachers – 71%; Secondary teachers – 60%.
- What are the computers used for? What is the level of computer literacy/skills?
Tutors of school subjects. Programmes used - Word, Excel, Search information on the Internet, on CD ROM.
- What is the level of information and communication technologies integration in the curriculum?
MS Windows, MS Office, Internet Explorer etc..

2.3. Developing the ICT workforce

- Are there training opportunities for programming, maintenance, and support?
N/A.
- Who is offering them (public/private centers)?
Public centres.
- Are they affordable for majority/minority of the population?
Majority.
- Is on-line training available?

Limited (too expensive).

- Do employers offer training?

Promote.

3. Networked Society

3.1. People and organizations online

- What percentage of the population:
 - is aware of the existence of the Internet?
50%
 - has used the Internet recently?
10%
 - uses the Internet regularly?
3%
- What is the structure of users by gender, age, social and educational status?
Mainly males, 15-35 years, secondary and higher education
- What is the number of locally registered domain names (per 1000 people)?
0.2
- Is there advertising for online companies, and how common is it?
Widespread

3.2. Locally relevant content

- Are there (and how many: no, few, some, many) websites:
About 2,000
 - Providing local topics?
Yes
 - In local languages?
Yes
- How often are they updated and is content static or dynamic?
Several times/week. Content is generally static
- Are the above websites created in the community?
Business-companies.
- Are bulletin board systems, Usenet groups, newsletters, and/or listservs in use?
Yes
- Are there opportunities for Web-related training?
Limited (too expensive)

3.3. ICT in everyday life

- Does the population include information and communication technologies (phones, faxes, pagers, computers) in everyday life?
To a limited degree
- Are there phones, wireless phones, digital assistants, pagers, PCs and are they being used regularly? Are they used for household commerce (banking, online shopping, investing) and social and commercial interaction (bartering, online chat and etc.)
All of these facilities are present and are used. They are not yet used for household commerce and social and commercial interaction
- Are there PCs with e-mail capability available (cyber cafés, telecenters) and are they being widely used?

About 75 public points for accessing Internet – used to a limited degree

3.4. ICTs in the workplace

- Do employees have:
 - (Un)limited access to phones?
Limited access to phones
 - Personal e-mail accounts?
Limited use of email accounts
 - Internet access from personal workstations?
Limited Internet access
 - E-mail and web addresses on business cards?
Mainly for organisations

- What percentage of businesses and government offices have computers, how many of them, how many employees use them?
More than 50% have computers which a few employees use

- Are they networked?
In governmental offices and those of big organisations, yes
- Is business mostly conducted in person or by e-mail, or is there data-sharing, enterprise, reporting, transaction, and research applications? How intensively are they used?
Mostly in person with use of telephone and/or fax
- Are there efficiency gains resulting from the use of ICT systems?
Minor

4. Networked Economy

4.1. ICT employment opportunities

- Are there opportunities for technically skilled workers within the country?
Many opportunities
- Are companies from outside of the country investing in IT related projects?
To a restricted degree. UN, OSI, Euroasia Foundation, MTC (Russian) etc..
- What is the proportion of knowledge-workers and information-related businesses in the economy? (Percentage of labour force, percentage of GDP)?
4-5%
- Are businesses considering IT in their strategies?
Yes

4.2. B2C electronic commerce

- Do local businesses have websites and how many? Is content current or static?
About 4,000 (2,000 local). Mainly static.
- Are there online B2C transactions, or are transactions mainly oral and/or paper-based, phone or fax-based?
Mainly oral and/or paper-based with use of phone and/or fax
- Is online retail a noticeable component of overall commercial activity?
No

4.3. B2B electronic commerce

- What are the sources of market information and are they sufficient for providing transparency?
Traditional, teletext, websites, etc
- Are there online B2B transactions, or are transactions mainly oral, paper-based, phone or fax-based?
Mainly oral, paper-based with use of phone and/or fax
Can transactions be conducted online without paper documents? Is the process automated? Does it allow online tracking, monitoring?
No
What portion of B2B activity is conducted on line? Is there gain in efficiency?
No

4.4. E-Government

- Number of government resources online? Do they include information, hours of operation, any services? Is information current and relevant?
55 websites
Is there online interaction between government and citizens, or is interaction mainly oral, paper-based, phone or fax-based?
Mainly oral and/or paper-based with use of phone and fax
- Is there online interaction between government and suppliers and contractors, or is the interaction mainly oral, paper-based, phone or fax-based?
Mainly oral and/or paper-based with use of phone and fax
- Is it possible to download applications from the websites?
No
- Can citizens apply for permits, licenses, and taxes on line?
No

5. Network Policy

5.1. Telecommunications regulation

- Is liberalisation of the telecommunications sector planned or implemented?
Planned
- Is there competition between telecommunications service providers?
Very limited (regulation by state)
- Is broadband Internet access offered?
Only by state
- Is regulation set and enforced by an independent body?
By state

5.2. ICT trade policy

- Do tariffs or other restrictions (technical standards, domestic regulation, etc.) exist?
Tariffs
- Are there restrictions in the service (including information services) sector?

Tariffs

- Are there disproportional taxes on electronically delivered services?

No

- Is Foreign Direct Investment in IT sector existent, and is it encouraged, discouraged, restricted?

Restricted

6. Media

6.1. Radio, TV and newspapers

- Number of radio and TV stations, newspapers

172/120/610

- The size of audience/circulation.

7-8 million

6.2. Employment in the media

- Number of employees in the media

NA

- Trend: is the number increasing/decreasing?

N/A

7. Intellectual Capital

7.1. Patents

- What is the number issued per annum?

903

- What are the trends?

Rising

7.2. Copyrights

- What is the number issued per annum?

3,200

- What are the trends?

Rising

7.3. Licenses

- What is the number issued per annum?

208

- What are the trends?

Rising

7.4. Trademarks

- What is the number issued per annum?

5,155

- What are the trends?

*Rising***7.5. Scientific and/or technical associations***105***8. Education****8.1. Higher education**

- Total number of higher education establishments (public/private).
57 (42/14)
- Total number of students (total average per annum, in both the private and public sectors)
281.7 (36.6/245.1)
- Prevailing specialisations. (distribution of students among the fields)
Prevailing specialisations - total 245,100, of which:
 - *industry and construction* *70,700*
 - *transport and communications* *7,300*
 - *agriculture* *21,900*
 - *economy* *31,700*
 - *public health, physical training and sports* *12,600*
 - *education* *90,300*
 - *arts and cinematography* *1,800*
 - *others* *8,800*
- Cumulative number of population with higher education degrees (total in the fields of both science and technology)
761,200

8.2. Distance learning

- Distant learning facilities
N/A
- Number of students trained per center
N/A

9. Labour Force**9.1. Employment in science and technical fields**

- Number of employees and trends in the fields
42,200, falling trend
- Compensation rates in the fields (average salaries)
74,000 BRB/month

9.2. Employment in the electronics industry

- Number of employees and trends in the fields
40,000 (preliminary assessment)
- Compensation rates and trends in the fields
71,100 BRB/month

9.3. Employment in telecom industry

- Number of employees and trends in the fields
62,500, rising trend
- Compensation rates and trends in the fields
68,000 BRB/month.

10. Research and development

10.1. Research institutions

- Number of research institutions
307

10.2. Investments in research and development

- The total amount
\$67,000,000
- Government and private business breakdown of total investment in research and development
6,100,000 million - private.

11. Other issues

National initiatives regarding science and technology policy, venture capital, stimuli for students, scientists etc.

Annex III – Information on patents, trade-mark registration and licensing agreements

	Years								
	1993	1994	1995	1996	1997	1998	1999	2000	2001
Patents for inventions									
Applications for a patent, in total	1494	1688	1039	1059	1162	1209	1189	1198	1144
National applicants	828	683	624	698	752	910	992	995	932
Foreign applicants	666	1005	415	361	410	299	197	203	212
Patents registered	237	405	633	409	483	656	550	537	529
Utility patents									
Applications for a patent, in total						73	141	210	315
National applicants						70	134	198	304
Foreign applicants						3	7	12	11
Patents registered						25	96	138	264
Design patents									
Applications for a patent, in total	62	56	66	93	126	106	88	95	64
National applicants	56	48	53	48	66	66	66	73	56
Foreign applicants	6	8	13	45	60	40	22	22	8
Patents registered	4	11	47	78	25	56	41	143	104
Trademark registration									
Applications, in total	3708	6370	5742	5919	6571	6339	5550	5925	6778
Following national procedures	1724	2419	1809	2107	2262	2070	1880	2275	2782
National applicants	729	1032	844	1068	1209	1173	1150	1344	1885
Foreign applicants	995	1387	965	1039	1053	897	730	931	897
Following procedures of Madrid agreement	1984	3951	3933	3812	4309	4269	3670	3650	3996

Registered, in total		1929	4252	5500	5876	6375	6088	5150	5155
Following national procedures		14	359	1690	2219	2160	1920	1500	1490
Following procedures of Madrid agreement		1915	3893	3810	3657	4215	4168	3650	3665
Licensing agreements									
Agreement registered, in total	12	59	45	110	136	160	204	206	208
Licensing agreements	11	56	35	56	49	77	92	77	73
Patents and trade-marks assignment agreements	1	3	10	54	87	83	112	129	135

Annex IV – ICT projects for 2002 - 2005

	Project	End of implementation period
1.1	Development of complex project of step-by-step establishment of the state automated information system	2004
2.1	Development and introduction of an automated information system for the Administration of the President of the Republic of Belarus	2003
2.2	Development and introduction of automated information and analytical system, providing informational interaction between institutions of the Administration of the President of the Republic	2003
2.3	Development and introduction of automated information system for the Chamber of Representatives of the National Assembly of the Republic of Belarus	2003
2.4	Development and introduction of modern system of correspondence processing in the Chamber of Representatives of the National Assembly of the Republic of Belarus	2003
2.5	Development and introduction of an automated information system for the bodies of the Prosecutor’s Office of the Republic of Belarus	2003
2.6	Development and introduction of a modern system of correspondence processing in the Supreme Court of Justice of the Republic of Belarus	2003
2.7	Development and introduction of an automated integrated information system for the Ministry of Justice	2005
2.8	Development and introduction of an automated information system for the general jurisdiction courts	2005
2.9	Development of an integrated automated system for the Council on control coordination in the Republic of Belarus	2005
2.11	Development of an integrated automated system for the State Control Committee of the Republic of Belarus	2005
2.12	Development of an automated system for the informational provision of operative and investigation activities of the police.	2004
2.13	Development of an integrated automated system for the State Road Police	2002
2.14	Development of an automated information and analytical system for internal troops	2003
2.15	Development of an automated system of data analysis and decision-making support for the Ministry of Foreign Affairs	2002
2.16	Development of an integrated automated system of foreign trade regulation for the Ministry of Foreign Affairs	2004

2.17	Development of an automated informational system for the State Treasury	2003
2.18	Development of an automated informational system on costs of goods and services	2003
2.19	Development of an automated system “State registry of the population”	2005
2.20	Development of an automated system for regulation of the securities’ market	2003
2.21	Development of an automated system of distance training for the chief personnel of entities based on informational network TELEINTERNET	2002
2.22	Development of an automated informational system for forming, processing and assignment of informational resources of the Ministry of Statistics and Analysis	2005
2.23	Development of an automated system for informational provision to border troops	2005
2.24	Development of an automated informational system for assessment of dynamics of the most dangerous diseases and the effectiveness of rehabilitation, based on the data of the Registry of population health	2004
2.25	Development of an automated informational system for assessment of effectiveness of medical and rehabilitation measures for population affected by Chernobyl catastrophe	2002
2.26	Development of an automated analytical system for transition of maternity homes to the reporting system of the International diseases classification	2003
2.27	Development of an automated analytical system for the sanitary-epidemiological office	2004
2.28	Development of an automated system of labour organs	2004
2.29	Development of an automated system for formation and use of information resources on emergencies and information exchange based on GIS technologies, and establishment of the programme-technological complex for support of the State system of the preventing and liquidation of emergencies.	2004
2.30	Development of an automated system for the formation and use of State register for natural resources	2004
2.31	Development of an automated informational system of agricultural production and local management	2002
2.32	Development of an automated system for the Ministry of Agriculture and Foodstuff, including formation of databases on economic information, and information resources for the analysis of power- and resource saving	2004

2.33	Development of an automated informational system on soil fertility	2004
2.34	Development of software complex for the creation of a State catalogue of the names of the geographic objects and provision for information exchange with different automated systems	2002
2.35	Development of the state system of geoinformational provision and creation of an automated system for its management	2005
2.36	Creation of a digital databank on cartographical data	2003
2.37	Development of national databases of authoritative records	2003
2.38	Development of a united databank of sport facilities	2002
2.39	Development of an automated informational analytical system for the Ministry of Sport	2004
2.41	Creation of a databank “State standards of the Republic of Belarus”	2003
2.42	Development of an automated system on management, dissemination and publication of state classificatory of economical and social information and an electronic catalogue of indexes	2002
2.43	Development of a corporative automated system for management of Fund for the social protection of the population	2005
2.44	Creation of the State patent informational fund, development of an automated system of patent investigations	2004
2.45	Development of informational system of the State certification committee	2003
2.46	Development of technological and programmatic decisions for creation of automated systems of informational support for activities of administrative bodies on regional and municipal levels. Formation of basic informational resources of regions and municipalities	2004
2.47	Development of automated system of information resources of the State city-building register of the Gomel region and creation of an information analytical system for decision-making support	2003
2.48	Development of automated system for implementation of the program of socio-economic development in Grodno regional executive committee	2003
2.49	Development of corporative informational system for Minsk regional executive committee	2004
2.50	Development of project for creation of an educational system network, a standard project for the introduction of information technologies into training and education management systems, and a project of information infrastructure for the distance learning centre.	2002

2.51	Creation of a corporative network of libraries	2005
2.52	Creation of information resources for the provision of training, methodical and research work of teachers on the basis of educational establishments	2003
3.1	Development of standard project of document processing automated system	2002
3.2	Development of standard information technologies for registering and storing documents in archives of the state institutions	2005
3.3	Development and introduction in Brest region of the standard project on creating the regional automated informational and analytical system.	2003
3.4	Development of standard project of complex automation of accounting in state organs and institutions	2002
3.5	Development and introduction of standard project for automation of librarian activity and organisation of access to the exterior sources of the librarian funds	2004
3.6	Development and introduction in Minsk regional executive committee of standard automated system of management of state register of entities and individual entrepreneurs	2003
3.7	Development and introduction of standard system of trade enterprise management	2004
4.1	Drafting a law “On amendments of the Law of the Republic of Belarus “On Informatisation” with a view of harmonising it with the relevant Law of the Russian Federation.	2003
4.2	Development of normative documents, which determine the status of information transmitted through global open information networks and lists nontransferable information, as well as control procedures	2003
4.3	Development of normative base for improvement of existing order of funding works in informatisation sphere	2002
4.4	Development and enactment of methodical recommendations on informational interaction between the open automatised informational system of state organs.	2003
4.5	Working out statute of the State Register of information technologies and software and developing proposals for its introduction	2002
4.6	Working out a draft of the special state program for export development (export-oriented production of informational technologies), containing the matrix of measures for training and retraining ICT specialists in accordance with international requirements and standards	2003

5.1	Development and enactment of normative and methodical document for certification of system administrators in state administrative bodies	2002
5.2	Development and enactment of normative and methodical document for certification of services in the sphere of information technologies.	2004

Annex V – List of major national information resources

1. Consolidated databank of population census
2. Databank of annual demographical data
3. Database on migration
4. Database on population registration
5. Database on population size
6. Annual data on employment and salaries
7. Database on unemployed, vacancies, and retraining
8. National classification of professions
9. Database of employment agency licenses
10. National classification and tariffication of jobs and professions
11. Register of people's health
12. List of medical establishments
13. Databank on retirees and their pensions
14. Databank on social protection of lower-income people
15. Register of individual insurances
16. Database on socio-hygienic monitoring
17. Database on higher educational establishments
18. State register of historical and cultural valuables
19. State catalogue of library stocks
20. Databank on historical and cultural heritage of the Republic of Belarus
21. Database on secondary schools
22. Register “Blazon Matricul”
23. Database on colleges
24. Database on cultural establishments
25. Database on elections and referenda
26. Database on children and youth associations
27. Database on NGO
28. State water register
29. State land register
30. State atmospheric air register
31. State fauna register
32. State subsoil register
33. State flora register
34. State register of peaty soils
35. State climate register
36. State forest register
37. State register of mining claims
38. State register of dangerous enterprises
39. State register of environment monitoring sites
40. Database on fishing and fish stocking
41. Databank of land plans and maps
42. Catalogue of coordinates and height
43. Catalogue of geographical object names
44. Catalogue of satellite observations
45. Databank of gravimetrical calculations
46. Databank of aero and space surveys
47. National genetic fund of useful plants
48. Register of territorial and political subdivisions

49. Register of botanic collection
50. Database on explosive and fire-danger objects
51. Register of road network names
52. Database on topographic information
53. Topographic basis
54. Database on stored and buried pesticides
55. State registry underground realty
56. Regional registries of housing space
57. Register of communal property
58. Register of state property
59. State register of building
60. State register of pledged property
61. State register of lease contracts
62. Database on national enterprises
63. Databank on national industrial production
64. Database on value of fixed assets
65. Database on agrochemical and radiological properties of soils
66. Cattle breeding database
67. Register of agricultural entities
68. Database on agriculture
69. Database on agricultural machinery
70. Database on seed stock
71. State town-building register
72. Register of town-building and construction entities
73. Database on mainline subscribers
74. Register of broadcasting frequencies
75. Register of local roads
76. Database on grid resources
77. Database on road network
78. Database on transportation
79. Database on vehicles
80. National trade balance
81. Structure of export and import
82. Database of distribution of export and import by countries
83. Register of entities engaged into foreign trade
84. Custom statistics
85. Database of technologies for entrepreneurship
86. State register of protected securities
87. State register of taxpayers
88. National accounts
89. Balance of payments
90. Database on pay public services
91. Register of securities issues
92. Register of licenses of securities market dealers
93. Database on national scientific capacity
94. Database on results of research and development works
95. Database on inventions and patents
96. Database on trademarks
97. Database on new technologies
98. Register of research and development works
99. State register of information resources

100. State register of information technologies and software
101. State register of calibration means
102. Databank of goods produced in Belarus
103. National register of weapon and ammunition
104. National fund of standards
105. Register of certificates of the national certificate system
106. Register of testing laboratories accreditation system
107. Standard databank of national legislation
108. Normative base of construction works