OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as "developed", "industrialized" and "developing" are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

European Commission

United Nations Industrial Development Organization

State University – Higher School of Economics
Institute for Statistical Studies and the Economics of Knowledge

Information society statistics in the Russian Federation: Harmonization with international standards

by

G. Abdrakhmanova, P. Bøegh-Nielsen, L. Gokhberg, G. Kovaleva, O. Shuvalova, A. Sokolov

V.07-82147

Board of editors:
P. Bøegh-Nielsen, L.Gokhberg

This publication was prepared by:
G. Abdrakhmanova, P. Bøegh-Nielsen, L. Gokhberg, G. Kovaleva, O. Shuvalova, A. Sokolov

**Information society statistics in the Russian Federation:
Harmonization with international standards,
Higher School of Economics of the State University, Moscow, 2007**

This publication, which was prepared by the Institute for Statistical Studies and the Economics of Knowledge, Higher School of Economics of the State University, analyses various aspects of the development of internationally comparable statistics on the information society in the leading countries of the world and in the Russian Federation. It describes the main methodological provisions and indicators of Russian and international statistics, and includes new results obtained in the course of the project on the "Development of methodologies for ICT statistics in Russia based on international standards", implemented by HSE with support of the European Commission (EC) and the United Nations Industrial Development Organization (UNIDO).

Contents

Abbreviations and acronyms 5

Foreword 6

I. Information society statistics: international standards 7
- A. Elements of an information society 7
- B. Defining the ICT sector and measuring the ICT supply 8
- C. Defining e-commerce 11
- D. Measuring ICT demand 13
- E. ICT statistics 14
- F. The road ahead 15

II. Statistics on the information society in the Russian Federation 17
- A. Results 17
- B. Trends 19

III. The ICT sector in the Russian Federation 21
- A. Defining the ICT sector 21
- B. Statistical studies 23
- C. Sources of information 24
- D. Analysing the state of the Russian ICT sector 25
- E. Specialized survey of ICT sector enterprises: tools and results 30

IV. ICT use by enterprises 33
- A. Scope of the statistical survey 33
- B. Statistical analysis of ICT use by enterprises in the Russian economy 34

V. Training ICT professionals at Russian higher education institutes 38
- A. Identifying ICT related skills and professions 38
- B. Statistics regarding the training of ICT professionals 38
- C. Statistics regarding higher education institutes that provide ICT training 39

VI. ICT use by households and individuals 46
- A. International practices and the Russian experience 46
- B. Preparing the survey 48
- C. Access to ICTs in households 50
- D. Frequency of computer and Internet use by individuals 51
- E. Reasons for using the Internet 52
- F. ICT skills 54

VII. First benchmarking of the information society in the Russian Federation 58
A. The ICT sector 58
B. ICT use by enterprises 59
C. ICT use by households 60
D. E-skills 63

Annex 65
References 117

Abbreviations and acronyms

CCFEC	Commodity Classification of Foreign Economic Activities
Eurostat	Statistical Office of the European Communities
EC	European Commission
EC-UNIDO-HSE Project	EC-UNIDO-HSE Project on “The development of internationally comparable statistics on the information society in the Russian Federation” implemented jointly by HSE, UNIDO and EC
HSE	Higher School of Economics of the State University
ICT	Information and communications technology
ISIC	International Standard Industrial Classification of All Economic Activities
NACE	Nomenclature générale des activities économiques dans les Communautés européennes
OECD	Organization for Economic Cooperation and Development
RCAA	Russian Classification of Administrative Areas
RCEA	Russian Classification of Economic Activities
RCEAPS	Russian Classification of Economic Activities, Products and Services
RCEO	Russian Classification of Enterprises and Organizations
RCGAA	Russian Classification of Government Authorities and Agencies
RCLFS	Russian Classification of Legal Forms and Statuses
RCO	Russian Classification of Occupations
RCP	Russian Classification of Products
RCPEA	Russian Classification of Products by Economic Activities
RCFO	Russian Classification of Forms of Ownership
R&D	Research and development
Rosstat	Federal State Statistics Service
Rosstat Statregistry	Rosstat Statistical Registry of Economic Agents
UNIDO	United Nations Industrial Development Organization
WPIIS	OECD Working Party on Indicators for the Information Society

Foreword

The material in this report is grouped into seven sections. The first addresses international standards that allow for the comparability of surveys conducted in various countries and an adequate analysis of a country's information society and its components. The second section presents a brief analysis of the current state of information society statistics in the Russian Federation. In the next four sections, the reader will find the results of pilot surveys conducted in the course of the project, describing the following aspects of the development of an information society in the Russian Federation: the information and communications technologies (ICTs) sector, the use of ICTs in enterprises, the training of ICT professionals and the use of ICT by households and the population. The final section includes an international comparison of ICT development indicators in the Russian Federation and other countries, including France, Germany, Japan, Poland, the United Kingdom of Great Britain and Northern Ireland, and the United States of America. The average values for the current 25 member states of the European Union (EU25) and for the 15 member states of the European Union prior to expansion (EU15) are also considered.

The researchers from the Institute for Statistical Studies and the Economics of Knowledge, Higher School of Economics of the State University, would like to express their sincere gratitude to Mr. Shyam Upadhyaya (UNIDO) and Mr. Pierre Dybman (EC) for their valuable advice and help in the implementation of this project. They also would like to thank the Ministry of Information Technologies and Communications of the Russian Federation and the Federal State Statistics Service (Rosstat) for their cooperation and support in conducting surveys on the development of ICT statistics.

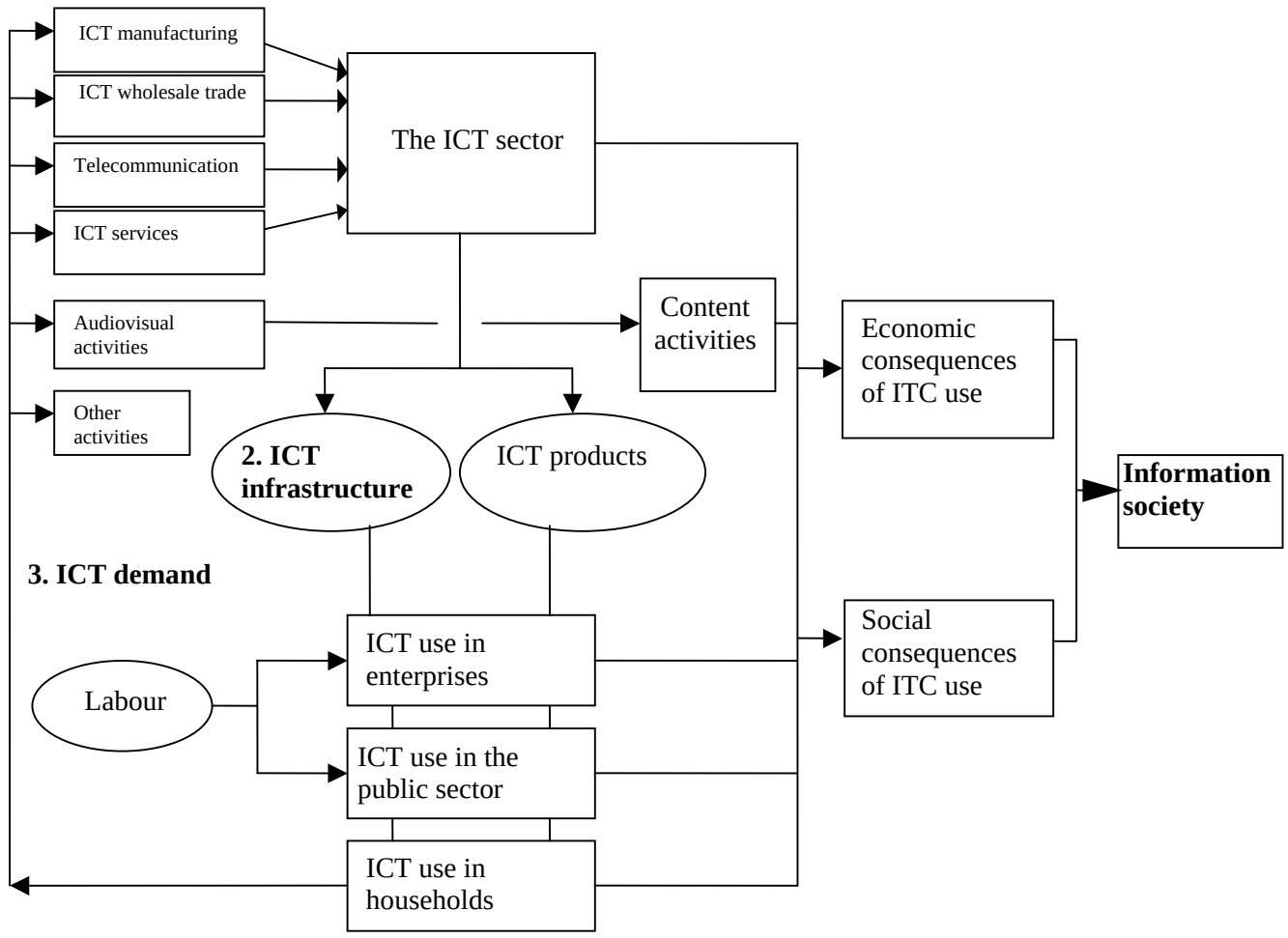
I. Information society statistics: international standards

Even if Russian official statistical offices have only recently started assessing the extent to which the Russian Federation has become an information society, the international statistical community has already identified a set of comparable indicators and established a framework for carrying out such assessments. This section describes the most important initiatives taken to establish comparable and internationally harmonized concepts and data collection methodologies. The results of the research project on the Russian information society presented in this publication are based on these international standards[1].

A. Elements of an information society

Although the international statistical society has reached agreement on a number of common definitions and concepts regarding ICT related elements, there continues to be no common international definition of what constitutes an information society. The most elaborate description of which elements constitute an information society has been developed by Nordic statistical institutes, and is shown in figure 1.

Figure 1. A conceptual model of an information society



[1] For a more detailed description of information society statistics, see OECD (2005).

An information society is usually understood as a society that makes extensive use of information networks and technologies, produces large quantities of ICT goods and services, and has a diversified content industry.

Statistics covering an information society can be grouped into three thematic pillars: ICT supply, ICT infrastructure and ICT use. The first pillar describes the ICT sector and the supply of ICT: which industries and how important are they for the national economy in terms of how many enterprises are involved and how many persons are employed? Which types of products and services are produced and what is the total turnover?

The second pillar describes the technical infrastructure, including the penetration rates of fixed and cellular telephone networks, the number of computers per inhabitants and the number of Internet connections. This part describes how ready a country is to become an information based society.

The last pillar describes the demand side: who—among enterprises and individuals—is using ICT products and services? Which technologies are being used and why? And what barriers to a country's integration in the global information society can be identified?

B. Defining the ICT sector and measuring the ICT supply

The main international body to have developed methodologies on the issue has, from the very beginning, been the Working Party on Indicators for the Information Society (WPIIS), a body of the Organization for Economic Cooperation and Development (OECD) that was established in 1997. The first achievement of the WPIIS was the adoption, in 1998, of a definition of the ICT sector based on a set of principles that provides a conceptual basis for identifying and selecting activities as ICTs (see box 1). The selection was based on the International Standard Industrial Classification (ISIC) of the United Nations and includes only whole activities, not parts.

Box 1
Conceptual principles for identifying an activity as an ICT

In manufacturing, the products of a candidate activity must be intended to process and communicate information, as well as to transmit and display it, or to use electronic processes to detect, measure and/or record physical phenomena, or to control a physical process. In service activities, the products of a candidate activity must be intended to enable the processing and communication of information by electronic means.

This definition has allowed statistical institutes to use existing structural business statistics—such as employment, turnover, wages and salaries, and added value—to assess the size and structure of the ICT sector. On the basis of the definition, the ICT sector is currently subdivided into 17 activities (see box 2).

Box 2
The ICT sector

Manufacturing

(a) Manufacture of office, accounting and computing machinery (ISIC Rev. 3.1 3000);

(b) Manufacture of insulated wires and cables (ISIC Rev. 3.1 3130);

(c) Manufacture of electronic valves and tubes and other electronic components (ISIC Rev. 3.1 3210);

(d) Manufacture of television and radio transmitters, and apparatus for line telephony and line telegraphy (ISIC Rev. 3.1 3220);

(e) Manufacture of television and radio receivers, sound or video recording or reproducing apparatus, and associated goods (ISIC Rev. 3.1 3230);

(f) Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment (ISIC Rev. 3.1 3312);

(g) Manufacture of industrial process control equipment (ISIC Rev. 3.1 3313).

Services

(a) Wholesale trade of computers, computer peripheral equipment and software (ISIC Rev. 3.1 5151);

(b) Wholesale trade of electronic and telecommunications parts and equipment (ISIC Rev. 3.1 5152);

(c) Telecommunications (ISIC Rev. 3.1 6420);

(d) Renting of office machinery and equipment (including computers) (ISIC Rev. 3.1 7123);

(e) Computer and related activities (ISIC Rev. 3.1 72) (consisting of six activities: ISIC Rev. 3.1 721-725, 729).

As the ICT sector is a very dynamic sector, existing definitions and concepts need to be reviewed frequently. The WPIIS took the opportunity of reviewing the definition of the ICT sector when it reviewed the ISIC. Major changes, especially within the service activities, will be introduced once ISIC has been reviewed in the course of the 2008 statistical year. As a consequence of this review, the WPIIS has decided to narrow the definition of the ICT sector, as outlined in box 3 (OECD, 2006b).

Box 3
Revised principles for selecting an activity as an ICT

The products (goods and services) of a candidate industry must be primarily intended to fulfil or enable the function of processing and communicating, as well as transmitting and displaying, information by electronic means.

Although the new definition is narrower (having excluded the “electronic processes to detect, measure and/or record physical phenomena, or to control a physical process”), the number of activities listed as belonging to the ICT sector has been extended to include 19 activities. This is due to the creation of more service activities, as shown in box 4. Furthermore,

the ICT sector definition will be introduced as an official alternative analytical aggregation in the statistical classifications of the United Nations.

Box 4
Revised definition of the ICT sector according to ISIC Rev. 4

Manufacturing

(a) Manufacture of electronic components and boards (ISIC Rev. 4 2610);

(b) Manufacture of computers and peripheral equipment (ISIC Rev. 4 2620);

(c) Manufacture of communication equipment (ISIC Rev. 4 2630);

(d) Manufacture of consumer electronics (ISIC Rev. 4 2640);

(e) Manufacture of magnetic and optical media (ISIC Rev. 4 2680).

Trade

(a) Wholesale trade of computers, computer peripheral equipment and software (ISIC Rev. 4 4651);

(b) Wholesale trade of electronic and telecommunications parts and equipment (ISIC Rev. 4 4652).

Services

(a) Software publishing (ISIC Rev. 4 5820);

(b) Telecommunications (ISIC Rev. 4 61), consisting of four activities: ISIC Rev. 4 6110-6130, 6190;

(c) Computer programming, consultancy and related activities (ISIC Rev. 4 62), consisting of three activities: ISIC Rev. 4 6201-6202,6209;

(d) Data processing, hosting and related activities; web portals (ISIC Rev. 4 631), consisting of two activities: ISIC Rev. 4 6311-6312;

(e) Repair of computers and communication equipment (ISIC Rev. 4 951), consisting of two activities: ISIC Rev. 4 9511-9512.

In principle, the definition of the ICT sector given above should start by defining the goods and services to be classified as ICT products and, only then, identify for which activities these products are the main outputs. But this approach was perceived as too difficult and lengthy given how rapidly ICT goods and services change, the increasing use of ICT in different products, the relatively outdated commodity classification of the United Nations Central Product Classification, and the urgency with which users need a harmonized definition of the ICT sector.

While a definition of the ICT sector was being elaborated, ICT goods were being classified on the basis of the same principles defining the ICT sector. A classification system for ICT goods was developed based on the detailed updated and widely-used classification system used by the World Customs Organization: the Harmonized System. This is used for producing trade statistics and was finally adopted in 2003. In broad terms, the definition includes the categories listed in box 5.

Box 5
Categories of ICT goods

(a) Telecommunications equipment;

(b) Computer and related equipment;

(c) Electronic components;

(d) Audio and video equipment;

(e) Other ICT goods.

This categorization of ICT goods allows statistical offices to produce output statistics on the production of goods and on import/export. Once changes are made to the Harmonized System and to the Central Product Classification in 2007, existing definitions will be revised.

There is an obvious need for an ICT services classification that complements the ICT goods classification. However, since the list of services and products that could be classified was very rudimentary, a number of new and rapidly emerging services (such as website hosting or application provisioning) could not be included. The updated classification took a long time and was only adopted in late 2006 based on the revised Central Product Classification. The services classified by WPIIS as ICT services are included in version 2.0 of the Central Product Classification, the adoption of which is currently being discussed. In total, 28 service products have been identified. Box 6 lists the main categories (OECD, 2006c).

Box 6
ICT services classification

(a) Telephony and other telecommunications services;

(b) Internet telecommunications services;

(c) Lease or rental of ICT equipment;

(d) Information Technology (IT) technical consulting and support services;

(e) IT design and development services;

(f) IT infrastructure provisioning services;

(g) Business process management services;

(h) IT infrastructure and network management services;

(i) Maintenance and repair of computers and peripheral equipment;

(j) Published software.

C. Defining e-commerce

The second major outcome of international cooperation efforts among statistical offices on information society statistics are the operational definitions of electronic commerce (e-commerce). In the second half of the 1990s, policymakers and the media focused on the growth of e-commerce, which they predicted was going to be exponential. These predictions were based on various private sources that used different definitions, methodologies and data sources. The statistical offices and the OECD realized the urgent need for the establishment of a comparable set of guidelines for defining and measuring e-commerce. The definitions were endorsed in 2000 (see table 1).

According to the definitions, it is the method by which the order is placed or received, not the payment nor the channel of delivery, which determines whether the transaction falls under the definition of e-commerce. The narrow definition refers to transactions conducted over the Internet, while the broad definition refers to all computer-mediated networks. Especially within the European Union, the focus has been on the narrow definition, which emphasizes how the automated aspects of e-commerce have an impact on business processes and on the way businesses organize themselves. It thus excludes conventional e-mails, which are mainly interpreted as substitutes to faxes or surface mail (Bøegh-Nielsen, 2001).

Table 1. Definitions of e-commerce

E-commerce transactions	*Definitions*	*Guidelines for the Interpretation of the definitions*
Broad definition	An **electronic transaction** is the sale or purchase of goods or services, whether between businesses, households, individuals, governments, and other public or private organizations, conducted over **computer-mediated networks**. The goods and services are ordered over those networks, but the payment and the ultimate delivery of goods or services may be conducted either online or offline.	**Include**: Orders received or placed on any online application used in automated transactions such as Internet applications, EDI, Minitel or interactive telephone systems.
Narrow definition	An **Internet transaction** is the sale or purchase of goods or services, whether between businesses, households, individuals, governments, and other public or private organizations, conducted over the **Internet**. The goods and services are ordered over the Internet, but the payment and the ultimate delivery of the goods or services may be conducted either online or offline.	**Include**: Orders received or placed on any Internet application used in automated transactions such as Web pages, extranets and other applications run over the Internet, such as EDI over the Internet, Minitel over the Internet, or over any other Web-enabled application, regardless of how the Web is accessed (e.g. through a cellular telephone, television set, etc.). **Exclude**: Orders received or placed by telephone, fax or conventional e-mail.

D. Measuring ICT demand

A second thrust of work to improve the assessment of an information society has concentrated on developing some common methodologies for comparing international surveys that measure the use of ICTs in businesses, households and governments. The first area for international harmonization was the diffusion of ICTs among enterprises and its use for various purposes, from sending e-mails and trading electronically (e-commerce) to the integration of ICTs into business processes.

The statistical offices of the Nordic countries were the first, in 1998-1999, to establish a project aimed at developing a common set of guidelines for measuring ICT use in enterprises. Based on this experience, a model questionnaire on ICT use in enterprises was proposed, in close cooperation with WPIIS and the Voorburg Group on Services Statistics.

The underlying idea for elaborating a model questionnaire was the need for internationally comparable data. The model questionnaire is a data collection vehicle which can be used by national statistical offices to supplement the national results by comparing them to those of other countries on the basis of internationally agreed guidelines. The model consists of modules which can be used either in their entirety or separately in specific surveys. The latter approach was used in this project for measuring the use of ICT in enterprises in the Russian Federation (see section IV).

Based on the experiences gathered from a number of national surveys, including the first Eurostat pilot survey, a final proposal for a model questionnaire on ICT use by enterprises was adopted in October 2001. It comprised five modules:

(a) General information about ICT systems;

(b) Use of the Internet;

(c) E-commerce over the Internet;

(d) E-commerce over other computer-mediated networks;

(e) Barriers to the use of e-commerce, Internet and ICTs in general.

Normally, questionnaires for statistical data collection are supposed to remain unchanged for long periods, but this cannot be expected in the case of ICTs, which are constantly evolving. This is a methodological challenge for statistical institutes. On the one hand, the questionnaire needs to be constantly updated with relevant questions that respond to the needs of users, as has been the case with the annual Eurostat survey carried out by European Union member states. On the other hand, robust indicators need to be provided, thus allowing for time series analyses.

As a consequence of the rapidly changing needs of users, the model questionnaire was revised in 2005, especially with regard to questions related to ICT security, websites, e-business processes and interaction with government organizations via the Internet. Future revisions can be expected as a result of the technological and organizational innovations caused by ICTs, which have changed the focus of users.

The other major effort on the ICT demand side has been the development of a model questionnaire for statistically measuring the use of ICTs by households and individuals. Policymakers have expressed great concern about the possibility that ICTs and the Internet might create new inequalities in society, a digital divide, and that ICT use could influence daily life negatively as well as positively. A harmonized model questionnaire was adopted in 2002. It includes modules on:

(a) Access to ICTs by households and individuals, including barriers to access;

(b) Use of the Internet (frequency, purpose);

(c) Internet commerce, including barriers to e-commerce.

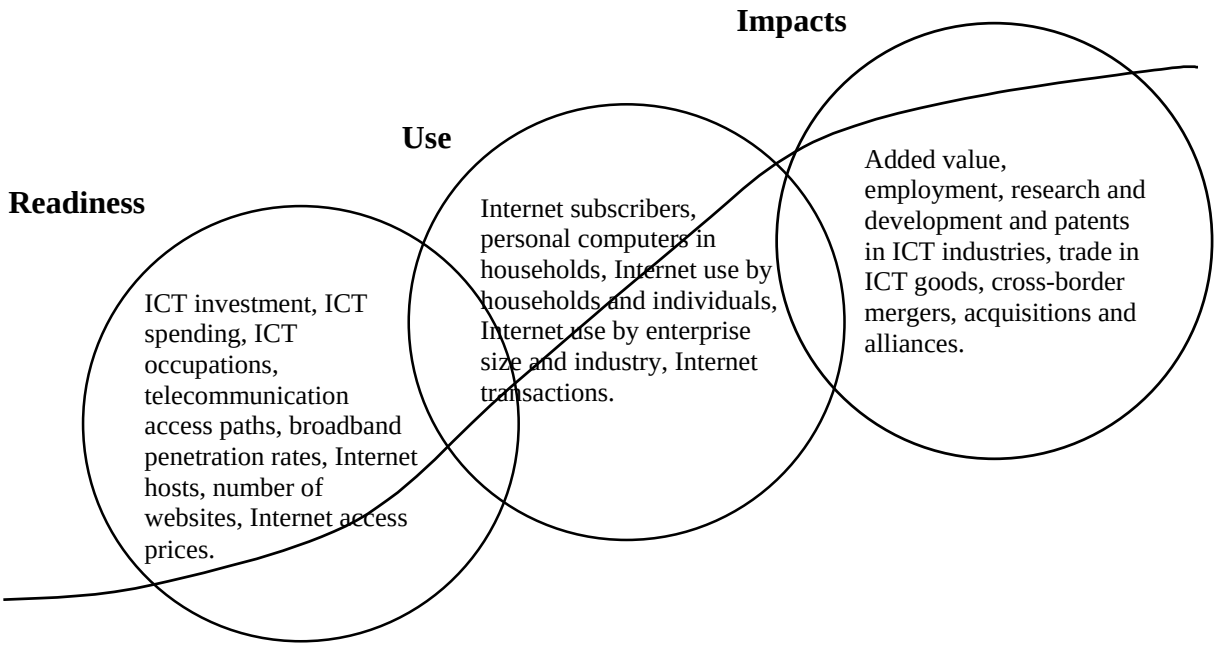
As in the previous case, this field too is very dynamic and developing rapidly. Consequently, the model questionnaire had to be revised already in 2005 to include the security of information technology, e-government, the download and purchase of digitized products, mobile Internet access and mobile telephone use. In the European Union, the questionnaire has been further developed to include a module on e-skills, in response to urgent demands for policy relevant information about the computer and Internet skills of the European population. The EU–UNIDO–HSE project on assessing the Russian information society has benefited from the recent development of the household survey in the European Union and includes, from the outset, information about the e-skills of the Russian population.

The strategy of Eurostat and the national statistical institutes has been to base the annual surveys on existing modules and to then supplement the model survey with an annual theme. For example, the survey will focus on e-business processes in 2008 and on e-commerce in 2009. In this way, the official statistics have been able to meet users' rapidly changing demands regarding ICT statistics.

E. ICT statistics

Since ICTs and the ways they are used are changing rapidly, the international statistical community decided early on that it would not be realistic to monitor such a dynamic sector with only a few indicators or with indicators developed over a very short period. WPIIS took a step-by-step approach whereby statistics regarding the development of ICTs in society can be grouped into three phases: analysis of readiness, intensity and impact. It was then decided to develop indicators accordingly (see figure 2).

Figure 2. Measuring the ICT economy



Information society statistics can be divided into two types: statistics on the supply of ICT and statistics on the use of ICT. The first type—which covers the ICT sector, its input (mainly employment) and output (goods and products)—is based on existing statistics that have a broader scope than just measuring the information society, that is, structural business statistics and production or external trade statistics. The other type—which covers ICT use—however, normally comprises statistics that have been developed especially for and are dedicated to surveying the exact and specific target of ICT use (by enterprises or individuals/households).

Especially within the European Union, the use of official statistical information to monitor the development of the information society has, from the outset, been an important tool in shaping policy. In 2000, the European Commission and European Union member states adopted the so-called e-Europe Action Plan, which contains three major objectives: (a) a cheaper, faster and more secure Internet, (b) investing in people and skills and (c) stimulating the use of the Internet (European Commission, 2002).

In order to monitor the implementation of the e-Europe Action Plan in European Union member states, 23 key indicators, all quantitative, were defined. A number of these indicators could be directly derived from the statistics presented above (see box 7).

Box 7
Examples of e-Europe indicators

(a) Percentage of households connected to the Internet;

(b) Percentage of the population that uses the Internet regularly;

(c) Percentage of workforce with basic ICT skills;

(d) Percentage of workforce involved in teleworking;

(e) Percentage of firms buying and selling over the Internet.

In 2006, the e-Europe Action Plan was succeeded by a new strategy plan, the so-called i2010 initiative. i2010 is the European Commission's new strategic framework laying out broad policy guidelines for the information society and the media (European Commission, 2005). The purpose of this new, integrated policy is to encourage the development of knowledge and innovation with a view to boosting growth and creating more and better jobs. It forms part of the revised Lisbon Strategy.

i2010 rests on three pillars: (a) creating the single European Information Space, which promotes an open and competitive internal market for the information society and media services, (b) increasing investment in innovation and research in ICTs and (c) fostering inclusion, better public services and quality of life through the use of ICTs. The progress is monitored in annual reports, but due to the very heterogeneous character of the strategic framework, no set of relevant statistical indicators has been developed and approved, even though the first annual report utilizes statistics collected by the surveys on ICT use by enterprises and households.

F. The road ahead

As mentioned previously, the elements constituting the information society are of such a dynamic and rapidly changing nature that relevant statistics also need to be changed continuously. The statistics described above are still to be considered the core statistics for describing an information society and should, therefore, be used as a basis by countries that have

not yet assessed their information society statistically. Then, either in parallel or at a later stage, new areas of special policy interest can be covered.

The issue of e-government is high on the current policy agenda, and the European Commission is developing strategic guidelines to encourage public services to use ICTs. The issue of e-government has been addressed from the use perspective, and both the business and household surveys include questions on the use of public services. It is expected that these modules will be expanded in the future. In fact, the Nordic countries have already developed a model survey for monitoring the use of ICTs by government organizations that supplements the other two surveys. The issue of the international comparability of such surveys is essential and certainly a difficult challenge to overcome due to the heterogeneity of the public sector in different countries.

Following the initial approach of the WPIIS, it was decided that the issue of impacts of ICT use would be covered at a later stage. We have now entered this stage as policy demands are highlighting the need to understand the impacts of ICTs on economic productivity and on the competitiveness of enterprises. OECD has already published analyses of the impact of ICTs on growth and economic performance (OECD, 2004), and Eurostat has launched a project based on micro data analysis linking information on ICT use with economic data at the enterprise level. Furthermore, in this context, the issue of measuring electronic business processes is critical. The existing model survey on ICT use by enterprises includes questions on links to e-commerce, exploring such issues as whether systems are linked to internal or customers' systems in order to capture potential productivity gains from automatically linking electronic transactions to back-office processes such as ordering, delivery or accounting functions. But more methodological work is needed on integrated electronic business processes to better capture the impacts of automated ICT use.

Measuring the level of ICT skills and competences of citizens is another area of priority for policymakers. A better understanding of the current situation will help shape the policies needed to improve the level nationwide and thus keep the country competitive in a globalized world. The skills and competences of the population can be measured in many ways, but four basic indicators have been identified:

(a) Graduates with ICT relevant educations;

(b) Formal and informal ICT training;

(c) ICT occupations;

(d) ICT sector employment.

All four elements help assess the ICT literacy of a country. As the educational systems differ enormously from country to country, no internationally comparable definition of ICT education has been elaborated, as has been done for ICT activities or commodities.

Especially concerning ICT, the skills obtained through formal or informal training are of crucial importance and constitute an important asset in the global information society in the struggle for creating new jobs. The revised model survey used by Eurostat includes a module on e-skills which has also been tested in the project on measuring the Russian information society.

This project is consequently at the cutting edge in measuring informal or formal e-skills and can transmit useful experiences to the international statistical community in this area.

II. Statistics on the information society in the Russian Federation

The spread of ICTs and their role in the development of the Russian economy and social sector has created the need for a separate branch of socio-economic statistics on the information society based on the following principles:

(a) Provision of information on ICT development and use to interested users;

(b) Reflection of specific features of the ICT sector's operation in a market economy;

(c) Adherence to national statistical standards and established practices for conducting statistical surveys in the Russian Federation;

(d) Adherence to international standards and assurance of international compatibility of statistical data.

A. Results

As an area of knowledge, Russian statistics on the information society cover various activities connected to the creation, dissemination and use of ICTs in the economy, social sector, public administration and households. Their origins can be traced to the mid-1990s, when systematic terminology for research and development (R&D) and innovation statistics were being developed (Gokhberg, 1996), as was the programme for the statistical monitoring of information technologies.

The suggested methodological and procedural approaches were tested in 1996 during a cross-sectional survey of 54,300 Russian enterprises in all sectors of the economy (except farms and small enterprises) which owned computers and related equipment (Goskomstat Regulation, 25 March 1996). Respondents were asked to fill in questionnaire form number 1, on informatics. It was established that by 1 January 1996 the total stock of personal computers amounted to 1 million units, or four personal computers per 100 employees. Over a quarter (29 per cent) of surveyed enterprises were connected to a local area network, 94 per cent of enterprises owned software, more than half had databases and a quarter had access to telecommunications and data transfer networks (Goskomstat, 2003).

The next stage was the distribution of the second comprehensive cross-sectional survey, which was done on 1 January 1999 using questionnaire form number 2 on the "use of information technologies, production of computer hardware and software, provision of information and computing services" (Goskomstat Regulation, 22 April 1999). This survey covered 96,000 enterprises and consisted of two parts.[2]

The first part aimed at collecting data on ICT availability and use at enterprises in all sectors and industries of the economy. The results showed a significant increase of ICT use in the Russian economy since the previous survey three years earlier. The total stock of personal computers amounted to over 2 million units, or 8 personal computers per 100 employees. One third of enterprises had local area networks and almost a quarter of computers had access to global information networks, 15 per cent of which were connected to the Internet.

The second part concentrated on surveying the enterprises producing ICT related products and services, that is, enterprises belonging to the ICT sector. Enterprises were identified as belonging to this sector if at least 50 per cent of the goods and services produced during the financial year were ICT related. The sector was grouped by industries based on the Russian

[2] For more details on the survey see section VII.

Classification of Economic Activities, Products and Services (RCEAPS) valid in 1998. After the Russian Classification of Economic Activities (RCEA) was adopted and incorporated into statistical practices, the above grouping was slightly amended to reflect the more detailed classification regarding wholesale trade (see section III).

According to the results of the above mentioned survey, more than 1,000 enterprises were classified as belonging to the ICT sector. All manufactured computer hardware and software, or provided information technology services. Through the first survey of Russian ICT enterprises, a wide array of statistics was collected on the production of ICT related goods and services, the structure of the sector and the number and skill level of employees.

A further step in monitoring and analysing the ICT sector was the survey conducted in 2002 using questionnaire form number 1-GLOB on the "Use of global information networks" (Goskomstat Regulation, 28 June 2001), which covered 159,000 enterprises in 18 industries employing 27.8 million people. The questionnaire included four sections. The first collected data on the number of enterprises which in 2001 used or intended to use personal computers, local area networks, e-mail, the Internet and other global information networks. The second section asked participating enterprises to name and rate the barriers to the further spread of global information networks. Respondents were given a wide range of barriers to choose from, including production, technological, economic and legal factors. The third section of the questionnaire included questions on: the availability of personal computers, computer networks, special software used by enterprises for R&D; design; management of automated production processes or individual technologies; organizational, management and economic issues; electronic financial transactions; access to databases via global information networks; desktop publishing systems; and training programmes. The fourth section aimed at gathering and analysing data on the use of the Internet and other global information networks. The list of objectives included a specific section on the commercial use of the Internet for communicating with suppliers and customers.

In addition to data on the availability of computer hardware, software and networks, information about purposes and results of ICT use and obstacles to their further dissemination were also obtained. Based on the results of the survey, a first attempt was made to statistically evaluate the development of e-commerce in the Russian economy. Furthermore, the main indicators of ICT use in the Russian Federation were compared with appropriate international data on OECD and European Union countries. The results of the survey were published in the HSE statistical digest *Usage of information networks in the Russian economy* (HSE, 2004).

In 2003, statistical monitoring of the ICT sector reached a new level: based on research conducted by the Institute for Statistical Studies and the Economics of Knowledge, Rosstat approved annual federal state statistical monitoring questionnaire form number 3-inform on the "Use of information and communication technologies and the production of related goods and services" (available at http://www.gks.ru/form/Page24.html). Monitoring conducted with this questionnaire provides regular data on the spread of ICTs and their availability in the economy. It also provides information on the activities of enterprises that manufacture computer hardware and software, and that provide information technology related services. The questionnaire includes two major sections.

The first includes data about ICT use. Surveys conducted with this form provide information about the number of enterprises which use various kinds of computers, local area networks, global information networks (including the Internet) and dedicated communication lines. Responding enterprises are asked to: estimate what share of their employees uses personal computers, the Internet and other global information networks; name the objectives of using

global information networks; identify the results obtained through such use (or those expected in the near future); and list the barriers to the further spread of ICTs. A significant section of the questionnaire includes questions on the volume and structure of ICT related expenditures.

The second section aims at obtaining data on: the activities of ICT sector enterprises; how many ICT related products have been shipped and how many services have been rendered; changes expected in the next year; current expenditures; and investments in capital and intangible assets. The questionnaire also collects data on the number of technicians and graduates employed by ICT enterprises, and their skills. The raw data and analyses are published in the HSE statistical digest *ICT in the Russian Economy* (HSE, 2005; HSE, 2006).

Due to the complexity of the ICT sector and the difficulties involved in monitoring its development, however, this work must be coordinated with other branches of socio-economic statistics. First among these are the branches that deal with national accounts, structural business surveys, statistics on issues such as the labour market, investments, capital assets, finances, domestic and foreign trade, education, health care and households. Taking into account links with other industries and sectors of the economy allows for a clearer and fuller understanding of the matter and its trends, to conduct comparative analyses of the development of the ICT sector and the economy in general, the spread and availability of information technologies in various industries and the social sphere, and to integrate statistics on the information society into general national statistics. At the same time, it should be noted that other branches of statistics occasionally produce supplementary indicators beneficial for monitoring the information society. The use of different methodological approaches and the uncoordinated implementation of surveys that do not always cover the whole range of ICT related issues hamper a holistic analysis of the processes which, together, make up the development of an information society in Russia.

Thus, there is an urgent need to restructure ICT statistics in a systematic and integrated manner, and to bring them in line with international standards. In part, this has been done by the joint EU-UNIDO-HSE project on developing recommendations to improve the methodology of statistical surveys on the ICT sector on the basis of international standards and the European experience. During the project, the international experiences and the best national practices from Austria, Denmark and Italy, among others, were analysed. The main results of the project include an improved classification of the ICT sector based on harmonized international classifications and advances in areas that used not to be sufficiently represented in statistics, namely measuring the training of ICT professionals in Russian higher education institutes and the ICT related skills of the population. Pilot surveys conducted during the project demonstrated that ICT development indicators can be measured more precisely and provide higher quality information. Methodological recommendations to develop industrial statistics sections have been elaborated on the basis of the results of these surveys, in order to obtain more data on the development of an information society in Russia. Also, progress has been made in achieving the fuller integration of data collected by various branches of national statistics, including on enterprises, trade and education.

B. Trends

Speaking about the immediate prospects of information society statistics, there is an urgent need to complete the work on developing an integrated concept for statistically monitoring an information society. This includes the creation of a comparable system of indicators which incorporates not just the existing sections but also prospective indicators, in line with the current information needs of government agencies, scientific and business communities, international organizations and others. The socio-economic statistics of various sectors and industries should be adapted—on the basis of standardized methodological and organizational approaches,

concepts and definitions, statistical indicators, groups, etc.—so that the state of a country's information society can be measured. ICT sector statistics should be brought in line with internationally accepted principles based on enterprise statistics. In addition, more detailed statistical data should be provided, broken down by economic activities, products and services, thus permitting analysts to make appropriate aggregated evaluations.

It is important to make further steps in view of the future modification of standards and classifications envisaged by international organizations and Rosstat, in particular the revised ISIC, which should be adopted in 2008, and the new Russian Classification of Products by Economic Activities (RCPEA). With regard to the Russian ICT sector, doing so will allow for a more detailed classification of products and services, and for a more in-depth assessment of the ICT sphere.

Further statistical analyses of ICT use should be developed systematically and in harmony with international practices. In order to measure ICT use in government and municipal bodies and agencies, e-government trends should be monitored so as to take into account, among other factors, the availability of ICTs in this sphere, the ways in which ICTs are used and the results of such activities, barriers to further development, etc.

In statistically monitoring the use of ICTs in education, links should be made to educational statistics. Thus, appropriate modules should be added to national statistical forms and questionnaires used to collect information about educational institutions of all levels. Special attention should be paid to such aspects as preparing people for living and working in a society that is heavily reliant on information technologies by training them in the necessary ICT skills, improving the quality of training by using ICTs, providing access to modern education to various population groups, and levelling educational opportunities.

Data on ICT use by households should be collected through sample surveys of household budgets. Appropriate specialized thematic modules can be based on the statistical questionnaire on ICT use by households and e-skills developed and tested in the course of the EC-UNIDO-HSE project (see section VI).

III. The ICT sector in the Russian Federation

From the outset, the ICT sector has been a driving force in the development of information societies: not only by producing the inputs needed for building and developing a modern information society, but also in its own right by being an important source of economic growth and job creation, and by introducing new and innovative technologies that improve the performance of the global business sector. Therefore, characteristics of the ICT sector such as its output and production, its employment and investment structure, are important indicators for policymakers in analysing, benchmarking and comparing the national and international information society.

In the course of this project, an international expert evaluation of methodological approaches to statistical studies of the ICT sector that had been developed by HSE researchers was carried out. The evaluation was supplemented with a measurement of the activities of ICT sector enterprises based on internationally accepted indicators. Finally, a pilot survey using these indicators and approaches was conducted.

The methodological principles and the findings of the statistical monitoring of the ICT sector are described below. Also included is an analysis of the enterprises' activities that was conducted using the data obtained from existing statistics—such as structural business statistics and foreign trade statistics—combined with the pilot survey carried out as part of this project.

A. Defining the ICT sector

Central to any statistical study of the ICT sector is identifying the enterprises which can be classified as ICT enterprises, and the goods and services produced by the sector. According to the definition accepted in Russian statistical practice, which is fully in line with appropriate international standards (see section I and table III.1 of the annex), the ICT sector is made up of enterprises whose main economic activity is the production of goods or the provision of services which meet at least one of the following requirements.

The goods must:

(a) Be designed for telecommunications or for processing, including the transfer and display, of information; or

(b) Use electronics to detect, measure and/or record physical phenomena, or control physical processes; or

(c) Be individual components intended primarily for use within products described above.

The services must:

(a) Allow for the processing and transfer of information through electronic devices; or

(b) Be connected to the sale or leasing of hardware and/or software; or

(c) Directly create new information technologies or support the implementation, adaptation and/or use of existing ones (Gokhberg, 2002).

As mentioned in section I, a revised definition that expands the list of activities classified as belonging to the ICT sector has been approved internationally. According to calculations conducted in the course of this project, using this revised definition increases the output of the ICT sector in the Russian Federation by 5-10 per cent.

It should be stressed that even detailed analyses of the activities of ICT enterprises do not allow for a full and accurate estimate of the output of ICT related goods and services, for several reasons. On the one hand, the sector's enterprises might be engaged in other activities in addition to their main ICT business and thus produce goods and services unrelated to ICT. On the other hand, relevant goods and services can be produced by enterprises not classified as belonging to the ICT sector because it is not their main activity. One solution to that problem would be to adopt a detailed list of ICT related goods and services and use it to conduct statistical surveys of enterprises, including those whose main economic activity does not match the ICT sector definition, in order to capture the total production of ICT goods and services in a country.

Many countries (see section I) use a list of ICT related goods created on the basis of the Harmonized Commodity Description and Coding System. The list was put together using the same principles as those used to create the classification of ICT related economic activities. Russian statisticians use a local equivalent of the Harmonized Commodity Description and Coding System, called the Commodity Classification of Foreign Economic Activities (CCFEC). The list of ICT related goods according to CCFEC is provided in the annex, table III.2.

Unlike in international statistical practice, which allows ICT related goods to be aggregated by production and export/import indicators, in the Russian Federation it is only possible to group export/import data by that criteria. This is because the classification used to identify goods in the domestic market (Russian Classification of Products, RCP) is, structurally, totally incompatible with CCFEC. Consequently, it is not possible to develop an internationally compatible list of ICT related goods. The main groups of ICT related products according to the RCP are listed in table III.3 of the annex.

A solution to the problem of obtaining statistical data on the production and sale of ICT related goods in the domestic market should be found after the RCPEA is introduced in 2007-2008. This classification will be interlinked and compatible with the RCEA and the Statistical Classification of Products by Activity used in the European Economic Community. The introduction of RCPEA should facilitate a comprehensive analysis of the ICT related goods market, from production, sale, export, import and consumption.

To identify ICT related services, foreign statistical organizations normally define the sector based on the economic activities it is engaged in. In Russian statistics a local classification of ICT related services developed by HSE, which includes the following groups of services, is used in addition to RCEA:

(a) Consulting services for the purchase, installation and use of computers and related equipment;

(b) Software related consulting services;

(c) Consulting services on dataware and data processing;

(d) Services on data preparation and input;

(e) Design of automated information systems, R&D systems, design and management systems based on computer databases;

(f) Repair and maintenance of office equipment, computers and peripherals;

(g) Design of systems and applied software;

(h) Electronic information and directory services;

(i) Telematic and data transfer services;

(j) Information technology training services;

(k) Other information technology related services.

To analyse data on export/import of ICT related services, the Temporary Classification of Services in Foreign Trade is used. It identifies communications services (code 997520) and computer equipment and related maintenance services (code 9984).

B. Statistical studies

According to internationally accepted practice, statistical studies of the ICT sector include the following main areas:

(a) Network of enterprises;

(b) Infrastructure of telecommunications;

(c) Production and sales of goods and services by ICT sector enterprises;

(d) Production of ICT related goods and services;

(e) Human resources;

(f) Tangible and intangible assets;

(g) Financial state of the enterprises;

(h) Investments;

(i) R&D;

(j) Innovation activities;

(k) Export/import of ICT related goods and services;

(l) Tariffs for telecommunication services.

It is important to emphasize that a statistical study of the ICT sector must be in line with the general requirements for analysing the development of other sectors of the economy. At the same time, the specific features of this particular sector must be taken into account. The main indicators regarding the network of ICT sector enterprises include: their number and structure by activity type, ownership and size (number of employees).

An analysis of the infrastructure of telecommunications should reveal and describe the characteristics of enterprises providing telecommunication services. These services include: long distance, international and local telephone communications; document communications; wire broadcasting; radio communications; radio broadcasting; television and satellite communications; wireless telecommunications; e-mail; IP telephony; telematic services; and surface radio communications with mobile objects.

Data regarding the production and sales of goods and services, related expenditures, available resources and financial results of the ICT sector should be compatible with appropriate indicators describing the activities of enterprises in other sectors of the economy.

Analyses of human resources should include, along with figures on the number of staff employed in the sector and their share of the total national workforce, data on the skills structure of ICT employees. A list of ICT related occupations according to the Russian Classification of Occupations (RCO) is provided in table III.4 of the annex.

A statistical study of the ICT sector also includes indicators describing the R&D activities carried out by enterprises in the sector. Scientific knowledge and technological solutions

developed on the basis of this knowledge contribute significantly to ICT sector development, for they allow for the production of new advanced goods and services whose value is largely determined by their "intellectual component". The results of R&D activities contribute directly to the competitiveness of ICT enterprises. If one takes into account the further use that is made of ICT goods and services in all the other sectors of the economy, it is easy to see that the ICT sector affects economic growth and the standard of living of the whole society in an important way.

C. Sources of information

In most countries, structural surveys that measure the whole business sector are the main source of information about the ICT sector. The business register, which classifies companies by activity, identifies which enterprises belong to the ICT sector.

Russian statisticians use the Rosstat Statistical Registry of Economic Agents (Statregistry) and data collected from enterprises as part of structural surveys. The Rosstat Statregistry is a database of enterprises established within the Russian Federation and includes information about local units, individual entrepreneurs and other types of statistical units. To create and update the Statregistry, Rosstat uses relevant information from administrative sources such as Government information resources, tax registries, agencies responsible for public property management and licensing institutions. The Statregistry includes identification codes from the following national classifications:

(a) Russian Classification of Enterprises and Organizations (RCEO);

(b) Russian Classification of Administrative Areas (RCAA);

(c) Russian Classification of Government Authorities and Agencies (RCGAA);

(d) Russian Classification of Forms of Ownership (RCFO);

(e) Russian Classification of Legal Forms and Statuses (RCLFS);

(f) Russian Classification of Economic Activities (RCEA).

RCEA identification codes allow for the selection and grouping of ICT enterprises. As for using enterprise statistics to describe the ICT sector, this data depends on the nature and specific features of particular structural surveys (see table 2).

Table 2. Use of statistics on enterprises to describe the ICT sector

Questionnaire number	*Questionnaire title*	*Indicators describing the ICT sector*
P-1	Production and shipment of goods and services.	Enterprise turnover. Amount of own products shipped, volume of own services provided. Amount of manufactured products sold by other companies. Amount of own innovation products shipped, volume of own innovation services provided.
P-2	Investments.	Investments in capital assets.
P-3	Financial state of the organization.	Profit made or loss incurred. Number of profitable or unprofitable enterprises.
P-4	Number of employees, wages and employee turnover.	Average number of employees. Cost of wages.
11	Capital assets and other non-financial assets.	Capital assets.

At this stage, there are two main problems with creating a fully-fledged database of the ICT sector. The first is that only a few economic indicators are being tracked for the sector. The second is that there is a lack of relevant information about small enterprises.[3] No official questionnaire mentioned in table 1 covers small enterprises. Their indicators are calculated on the basis of sample surveys conducted with questionnaire form PM "Main indicators of small enterprise activity", and then only for broad groups of economic activities, which means that this data cannot be used to analyse the Russian ICT sector. Estimates of main indicators for small enterprises (turnover, number of employees working in the sector) are based on appropriate values for broader RCEO positions and economic activity indicators for large and medium enterprises. If we take into account that approximately every other enterprise in the Russian ICT sector is a small one, the way in which this problem is dealt with will greatly affect the credibility and quality of Russian ICT sector statistics.

D. Analysing the state of the Russian ICT sector

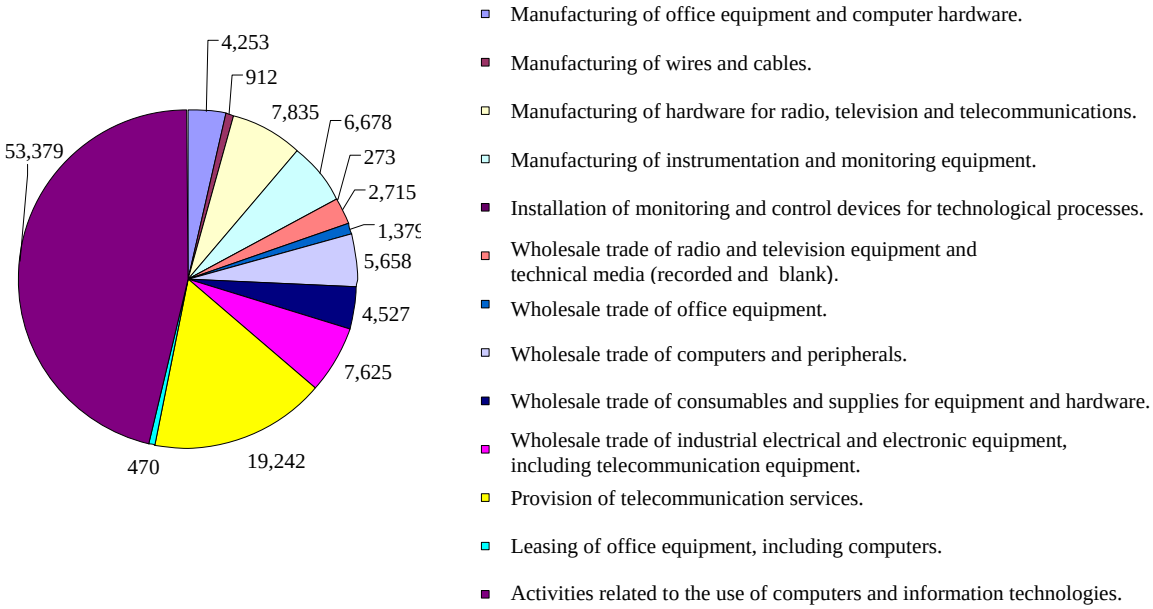
Information obtained from the sources mentioned above allows for an analysis of the activities of ICT sector enterprises. According to Rosstat Statregistry, by the beginning of 2006 there were 115,000 ICT enterprises in Russia (2.4 per cent of all enterprises in the economy).

[3] According to article 3 of the Federal law of 14 June 1995 #88-FZ "On state support for small entrepreneurship in the Russian Federation", small enterprises are defined as commercial organizations wherein the share of authorized capital stock owned by the Russian Federation, Russian Federal regions, municipal agencies, public associations or religious organizations does not exceed 25 per cent; wherein the share owned by one or more legal entities that are not small enterprises does not exceed 25 per cent; and wherein the average number of employees does not exceed the following limits: in industry, construction and transport, 100 people; in agriculture and R&D, 60 people; in retail trade and consumer services, 30 people; in wholesale trade and other industries and economic activities, 50 people.

Almost half (47 per cent) were engaged in activities connected with the use of computers and information technologies; 17 per cent manufactured ICT related equipment; another 17 per cent were active in telecommunications; 19 per cent were engaged in the wholesale trade of ICT related goods.

Figure 2. Structure of the ICT sector by economic activity in 2006

(Number of units, at the beginning of the year)



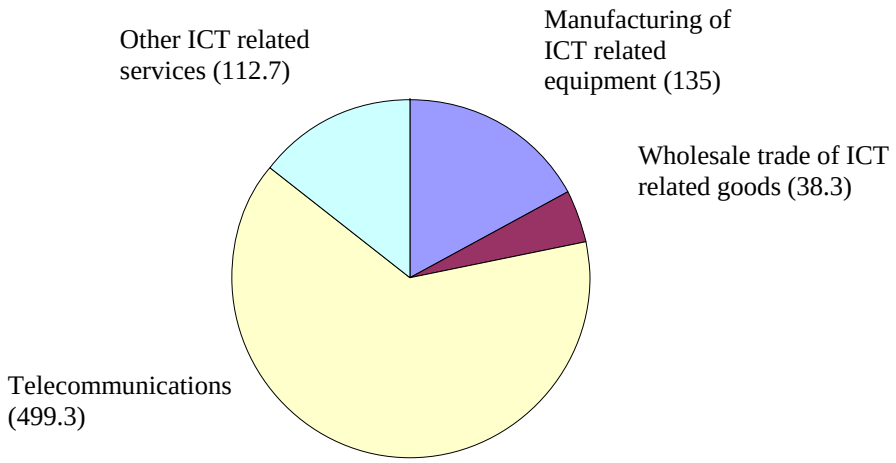
Source: Institute for Statistical Studies and the Economics of Knowledge, HSE.

The Russian ICT sector employs 1.3 million people, or 2.8 per cent of the national workforce. Gross added value[4] generated by ICT enterprises in 2005 amounted to 785 billion rubles, or 4.2 per cent of GDP. Its distribution by economic activities is shown in figure 3.

[4] The methodology used for calculating the gross added value created by ICT sector enterprises is described in table III.5 of the annex.

Figure 3. Gross added value generated by the ICT sector, by economic activity, in 2005[5]

(Billions of rubles)



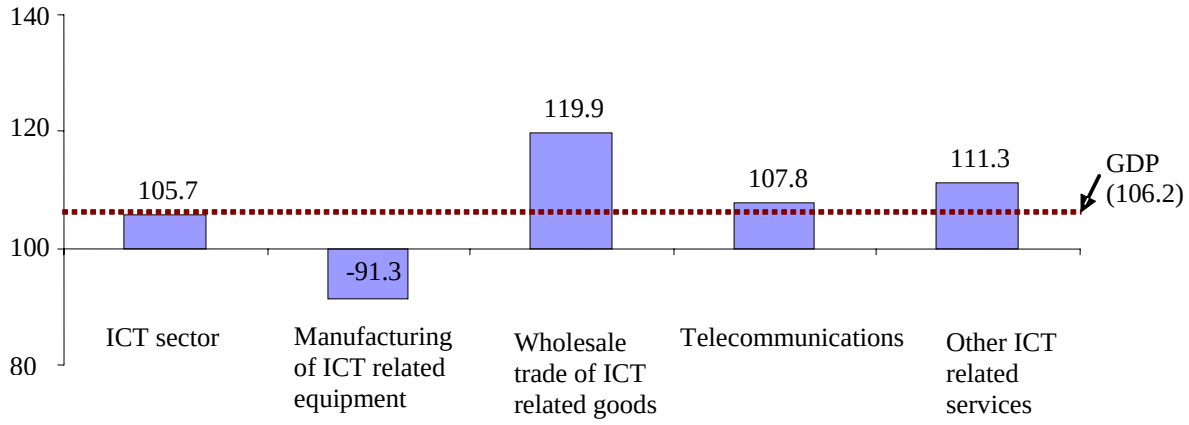
Source: Institute for Statistical Studies and the Economics of Knowledge, HSE.

In 2005, gross added value generated in the sector increased by 19 per cent in current prices and by 5.7 per cent in fixed prices, see figure 4.[6] These figures are lower than the average growth in total GDP for the Russian economy, which is of 25 per cent and 6.2 per cent respectively. This is because of poor results obtained by enterprises manufacturing ICT related equipment. Compared with 2004 the actual gross added value generated by enterprises engaged in the manufacturing of office equipment and computers, radio, television and communications equipment, insulated wires and cables, instrumentation and monitoring equipment dropped by almost 9 per cent in 2005, see figure 5. Despite an almost 20 per cent increase in investment, the competitiveness of the enterprises engaged in these activities was not affected. Wholesale trade of ICT related goods grew considerably, as did activities connected with computers and information technologies. The actual gross added value in these activities grew by 14 per cent and 5 per cent more than the corresponding GDP figures, respectively.

[5] Here and below broad groups of ICT related activities are used: manufacturing of ICT related equipment (RCEA codes 30, 31.3, 32, 33.2 and 33.3); wholesale trade of ICT related goods (RCEA codes 51.43.2, 51.64.1, 51.64.2, 51.65.2 and 51.65.5); telecommunications (RCEA code 64.2); other ICT related services (RCEA codes 71.33 and 72).

[6] GDP deflators for relevant economic activities were used to calculate the rate of growth of actual added value in the ICT sector.

Figure 4. Gross added value generated in the ICT sector, by economic activity, in 2005 as a percentage of 2004, in fixed prices



Source: Institute for Statistical Studies and the Economics of Knowledge, HSE.

In 2005, the turnover of ICT sector enterprises—including the value of shipped goods manufactured by them, the services provided directly by them and the revenues from sales of previously acquired goods manufactured by other companies—amounted to 1,282 billion rubles or 3.5 per cent of the corresponding figure for the whole economy. The highest growth rates in the sector were achieved by enterprises that provided ICT related services, primarily involving the use of computers and information technologies. The turnover of enterprises that were engaged in software design, data processing, the creation and use of databases and information resources, and that provided ICT consulting services in 2005 grew by 40 per cent, in comparable prices, compared with the previous year. That is much more than the figure for the whole ICT sector (16 per cent) or for the national economy (17 per cent).

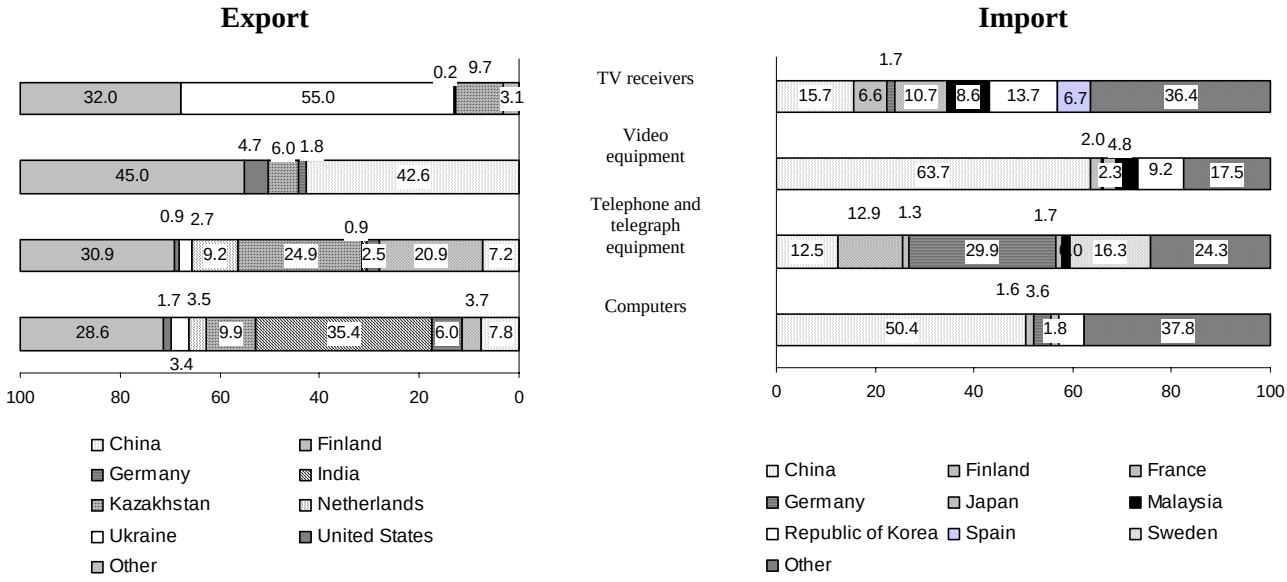
More investments are needed to ensure the sustainable growth of the ICT sector. In 2005, enterprises in the sector invested 192.6 billion rubles in their capital assets, or 25 per cent of the gross added value generated by the sector. For the whole economy, investments amounted to 16 per cent of GDP in 2005. the level of investments in capital assets grew by 10.5 per cent in fixed prices between 2004 and 2005, more than the rate of growth of actual value added generated in the sector, which amounted to 5.7 per cent.

Most of the investments in capital assets in the ICT sector made in 2005 came from telecommunication companies (91 per cent). Contributions made by enterprises manufacturing ICT related equipment amounted to about 5 per cent, while enterprises engaged in the wholesale trade of ICT goods to 3 per cent and enterprises whose activities were connected with use of computers and information technologies just 1 per cent.

Exports of main groups of ICT related goods (computers and components, telephone and telegraph equipment, video equipment, and television receivers) in 2005 amounted to US$112 million, or 0.05 per cent of total exports.[7] Imports of such goods exceeded exports by a factor of 29, and were valued at US$3.3 billion or 3.3 per cent of total imports. Compared with 2004, exports of basic ICT related goods dropped by 7 per cent while imports have grown by 30 per cent.

[7] Data about exports/imports is collected by customs statistics on the basis of customs declarations presented at customs offices by exporters/importers when cargo crosses Russian borders.

Figure 5. Exports/imports of various ICT related goods in 2005, by country, as a percentage of the total volume of exports/imports of these goods



Source: Institute for Statistical Studies and the Economics of Knowledge, HSE.

Russian ICT goods are exported to a few major markets: 55 per cent of television receivers are exported to Ukraine, 42.6 per cent of video equipment to China and 35.4 per cent of computers to India. Of the telephone and telegraph equipment, 24.9 per cent goes to Kazakhstan and 20.9 per cent to Finland.

Regarding imports, China is the main foreign supplier of ICT goods. It supplies 63.7 per cent of imported video equipment, 50.4 per cent of computers and 15.7 per cent of television receivers. Germany is the main supplier of telephone equipment (29.9 per cent).

In 2005, exports of communications services amounted to US$658 million, US$620 million of which came from telecommunication services. Since 2000, these exports grew by 71 per cent, while imports grew by 159 per cent. Total imports in 2005 were worth US$746 million, with telecommunications responsible for US$720 million.

Exports of computer and information services are growing fast. In 2005, these exports amounted to US$422 million, a growth of 65 per cent compared with the previous year. These exports' share of the total export of services grew from 0.6 per cent in 2000 to 1.7 per cent in 2005. Imports of computer and information services in 2005 amounted to US$482 million, practically the same as in 2000 (US$474 million). All communications, computer and information services amounted to 4.4 per cent of the total export of services and 3.1 per cent of imports.

The above figures show that the sector is not yet contributing as much as it could to the development of the country's economy. ICT sector enterprises contribute only 5 per cent of all the gross added value generated by the business sector . This is approximately half the size of the ICT sector in the United Kingdom and in the United States (see section VII).

E. Specialized survey of ICT sector enterprises: tools and results

To hone methodological approaches for conducting a statistical analysis of the ICT sector and to obtain data that would allow for a detailed study of relevant enterprises' activities, a specialized survey was carried out.

Target enterprises were selected on the basis of the Rosstat Statregistry data. A sample of 2,269 large and medium-sized enterprises associated with ICT related RCEA codes was drawn up, 1,751 of which took part in the survey. In total, these companies employed 545,000 people. The main information regarding the ICT enterprises that were surveyed (such as details about ownership, activities, number of employees) are given below (figure 6).

The ICT enterprises that were surveyed in 2005 shipped products that were manufactured in-house and services for a value of 424 billion rubles, excluding value added tax, excise and other duties. Almost two thirds (64 per cent) of the goods and services were ICT related.

Computers, audio and video equipment accounted for 53 per cent of all in-house manufactured goods shipped by the enterprises while sales of in-house produced software did not exceed 7 per cent of the total volume.

The enterprises sold ICT related goods (including software)[8] for almost 19 billion rubles, the biggest share of which went to enterprises engaged in activities connected with the use of computers and information technologies. Wholesale trade accounted for 19 per cent of the sale of all ICT related goods. Of ICT goods manufactured by other companies, 99 per cent were hardware and just 1 per cent software (see table III.8 of the annex).

The vast majority of surveyed enterprises were optimistic about their business prospects. Only 4 per cent[9] expected a decline in hardware production in 2006 compared with 2005, although it should be noted that these enterprises only have a 0.1 per cent share of total hardware production. Regarding ICT services, 6 per cent of enterprises expected production to decline; they had a 0.7 per cent share of the total. Enterprises were much more pessimistic regarding software production prospects: 4 per cent of companies forecast a decline; their share of the software market amounted to one fifth.

[8] Goods manufactured by other enterprises.

[9] Enterprises that were unable to evaluate their prospects were excluded.

Figure 6. Characteristics of surveyed ICT enterprises

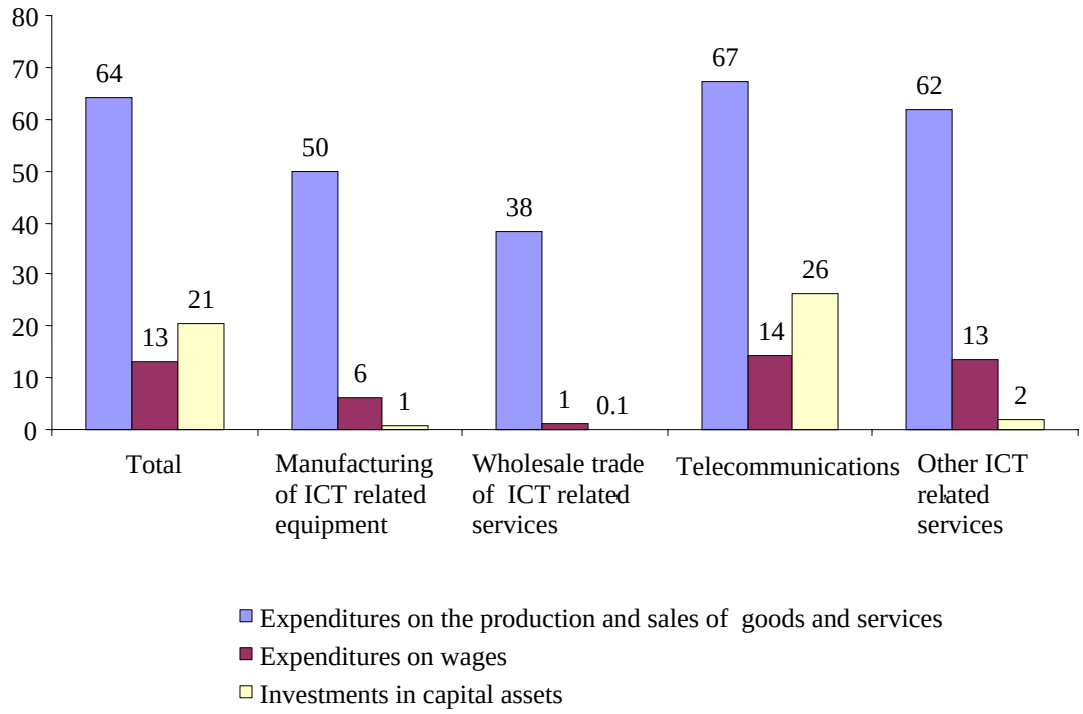
(Percentage of the relevant indicator for the surveyed enterprises)

Source: Institute for Statistical Studies and the Economics of Knowledge, HSE.

The sector's enterprises spent 285 billion rubles (or 64 rubles per 100 rubles of each enterprise's turnover) for the production and sale of goods and services. Investments in capital assets amounted to 91 billion rubles (21 rubles per 100 rubles of the turnover) (figure 7). For all large and medium size enterprises, the latter figure was almost half: 12 rubles.

Figure 7. Current expenses and investments made by ICT sector enterprises per 100 rubles of turnover, by economic activity

(Rubles)



Source: Institute for Statistical Studies and the Economics of Knowledge, HSE.

The ICT sector spent just 0.4 per cent of total expenditures on R&D. The enterprises that spent the most on R&D (92 per cent of total expenditures) were those engaged in activities connected with the use of computer equipment and information technologies. Communications companies spent 7 per cent of their total expenditures on R&D, while manufacturers of ICT related equipment only devoted 1 per cent of their expenses to R&D.

The level of skills of ICT sector employees remains rather low: only 9 per cent are top-level professionals (computer systems designers and analysts, programmers, electronics engineers, communications and instrument engineers) and only 4 per cent are medium-level ICT technicians (maintenance operators of computers and other hardware devices, or electronics and telecommunications technicians). More detailed statistical data collected by this pilot survey of the Russian ICT sector are provided in the annex.

IV. ICT use by enterprises

Measuring the extent to which ICTs are used by enterprises is important for assessing the maturity of a country's information society. In the Russian Federation, such statistics are based on an annual specialized statistical survey conducted with questionnaire form number 3-inform "Use of information technologies and production of related goods and services", which covers most economic activities. The statistical data collected through the questionnaire gives a comprehensive picture of the extent to which ICTs are used by businesses, government agencies and in the social sphere.

A. Scope of the statistical survey

The statistical survey on the extent to which enterprises use ICTs is aimed at enterprises active in all sectors of the economy (except small businesses) and in most economic activities (according to RCEA). The following economic activities were not assessed:

(a) Agriculture, hunting and related services (RCEA code 01);

(b) The administration and running of prisons, correctional facilities and other places of detention, and the provision of rehabilitation services to former inmates (RCEA code 75.23.4);

(c) Law enforcement and security services (RCEA code 75.24);

(d) Preschool and primary general education (RCEA code 80.1);

(e) Basic general, secondary (full) general, primary and secondary vocational education (RCEA code 80.2);

(f) Adult education and other education services (RCEA code 80.4);

(g) Disposal of sewage, waste and similar activities (RCEA code 90);

(h) The activities of public associations (RCEA code 91);

(i) Personal services (RCEA code 93);

(j) Housekeeping services (RCEA code 95);

(k) The activities of extraterritorial enterprises (RCEA code 99).

In line with international recommendations, the above activities are also excluded from the statistical monitoring of ICT use by enterprises in the Russian Federation. Thus, Eurostat guidance on assessing the extent of ICT use by enterprises specifies that the following economic activities, which constitute the business sector, must be covered (NACE, Rev.1): manufacturing, construction, trade, hospitality and catering, real estate, leasing and provision of services, transport and communications, recreation, culture, and sports. Surveys should cover all enterprises that employ more than 10 people (Eurostat, 2006). In order to ensure that Russian indicators are compatible with those of other countries, the data collected by the above mentioned Russian survey is grouped by all types of economic activities, as well as by the business sector, government agencies and the social sphere.

The questionnaire used to collect primary data on Russian enterprises is structured into seven modules:

(a) General information about the enterprise;

(b) Barriers to the use of information and communication technologies;

(c) Availability of personal computers at the end of the financial year;

(d) Purposes and results of using the Internet;

(e) Expenditures on ICTs in the financial year;

(f) Number and structure of the enterprise's staff;

(g) Need for ICT professionals and users at the enterprise.

The questionnaire was designed on the basis of standard definitions developed by Eurostat (see table IV.1 of the annex). It should be emphasized that the questionnaire is constantly being revised to keep the questions relevant and add new modules. The first group of questions identifies, for example, barriers to ICT use and the results of such use, and Internet connection speed. Taking into account the structure of the Eurostat questionnaire for surveying enterprises and similar statistical instruments designed in various countries (Denmark and Italy, among others) on the basis of the Eurostat model, new topics were added to the Russian questionnaire in 2006 to obtain data about:

(a) The use of Extranet, Intranet;

(b) Internet connection types;

(c) Internet connection speed;

(d) The use of specialized software to computerize the interaction with suppliers and customers, management of basic business operations including the purchase and sale of goods and services;

(e) The use of data protection tools for data transfer over global networks;

(f) The breakdown of Internet sales by volume and client groups;

(g) ICT skills including demand for ICT professionals and users, and hiring of external ICT consultants.

New indicators were developed to reflect relevant international practices and to take into account analyses of specific features of ICT use in Russia. The latter primarily affected indicators describing Internet connection type and speed, data transfer rate via global networks, data protection tools and the international compatibility of data. The main definitions of the indicators are given in table IV.2 of the annex.

The system of statistical indicators included in the programme for the statistical monitoring of ICT use and the production of related goods and services is hierarchical, in line with the envisaged areas of coverage (see above).

The survey uses the standard classifications (RCEA, RCFO, RCGAA, RCAA) plus local classifications that have been specially designed to take into account the specific features of the ICT sector (see table IV.3 of the annex).

B. Statistical analysis of ICT use by enterprises in the Russian economy

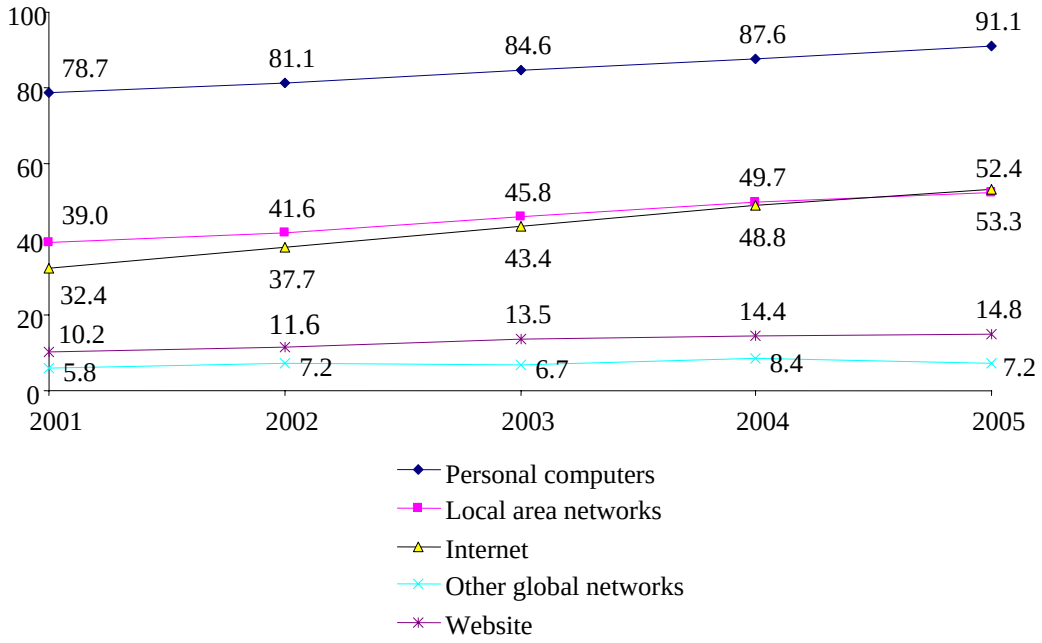
Data obtained via the annual specialized survey conducted with questionnaire form number 3-inform allows for an estimation of the level of development, availability and use of ICTs by enterprises in the Russian economy.

At the beginning of 2006, the 91 per cent of Russian enterprises that employed 98 per cent of the workforce in the country was using personal computers. Taking into account those enterprises that planned to start using personal computers in the near future (2 per cent), it can be

said that computers have completely penetrated the business sector, social sphere and public administration in the Russian Federation.[10]

The availability of modern personal computers creates an opportunity to move on to the next stage of ICT use: the integration of enterprises' information resources through computer networks. Of the surveyed enterprises, 52 per cent had local area networks and 53 per cent had access to the Internet. These figures have been steadily growing in recent years (figure 8).

Figure 8. Percentage of enterprises that use ICTs



Source: Institute for Statistical Studies and the Economics of Knowledge, HSE.

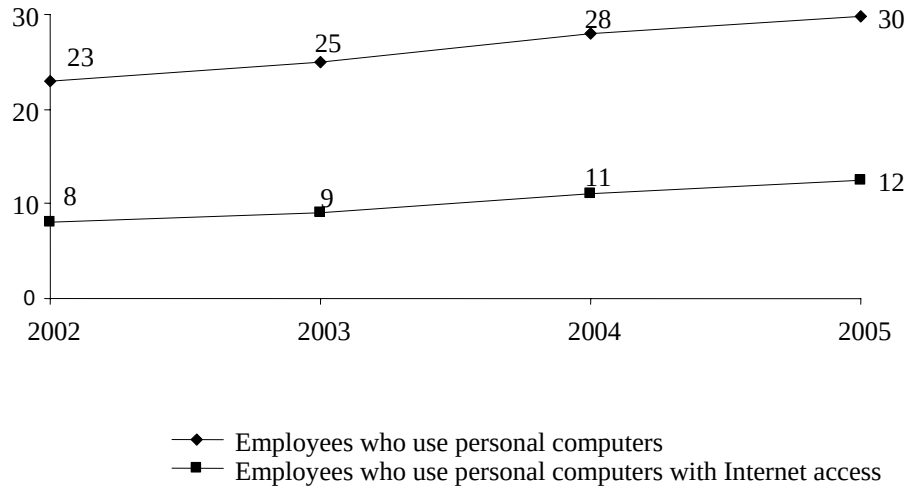
The level and complexity of ICT use by an enterprise can be measured by indicators such as enterprises having established a website. In this case, only 15 per cent of enterprises had their own websites or Internet pages and only 19 per cent had dedicated Internet lines.

As to obstacles to the further dissemination of computers and growth of their stock, 37 per cent of the surveyed enterprises said that a lack of funds was the main barrier. Far behind come the problems of a lack of skilled ICT professionals (9 per cent) and insufficient ICT related knowledge and skills among staff (5 per cent).

Despite the fact that almost all enterprises already had personal computers, only 30 per cent of employees used them regularly (at least once a week). The level of Internet use is even lower, with only one in every 10 employees using it at least once a week. These figures are growing but not by much. In the last four years, the share of computer users increased by less than 7 per cent and the number of Internet users grew by only 4 per cent (see figure 9).

[10] Here and below, enterprises are grouped by sectors according to the RCEA: the business sector includes units engaged in economic activities with the following RCEA codes: C, D, E, F, G, H, I, J, 71, 72, 73, 74; the social sphere: 80 and 85; and public administration: 75.

Figure 9. Use of personal computers and the Internet by employees as a percentage of all staff



Source: Institute for Statistical Studies and the Economics of Knowledge, HSE.

Comparing the levels of personal computer use by broader groups of economic activities reveals significant differences. In the business sector, 28 per cent of employees use computers; in the social sphere, 29 per cent; in public administration, 54 per cent. The level of Internet use is more uniform: in the business sector 12 per cent of the total number of employees have access to the Internet; in the social sphere, 15 per cent; and in public administration, 13 per cent.

The quality of Internet access is measured by availability of dedicated lines (broadband access). Currently, only 19 per cent of enterprises have that kind of access, 25 per cent of which are in the business sector, 11 per cent in the social sphere and 16 per cent in the public administration.

The most common reason for accessing the Internet is to search for information (according to 48 per cent of the surveyed enterprises), to exchange data (45 per cent) and to interact with government agencies (29 per cent of enterprises said they use the Internet to obtain blank forms such as tax and statistical returns, 22 per cent to return the forms once they had been filled in, 23 per cent to get information about Government agencies). Enterprises rarely use the Internet to train or educate their staff (13 per cent) or to hire personnel (9 per cent).

According to the management of the enterprises, the main effects of using the Internet included changes in the nature of work, making it more attractive and rewarding, improved relationships with partners and clients, improved working conditions and improvements in the enterprise's image (these results were noted by over 50 per cent of respondents). Using the Internet was important for finding new suppliers (38 per cent of the enterprises), reducing the costs of production and sale of goods and services (28 per cent), and diversifying into new products (25 per cent).

Thirty-four per cent of enterprises used the Internet to communicate with suppliers and 24 per cent to communicate with clients. Of the surveyed enterprises, 16 per cent placed orders for goods and services via the Internet, 13 per cent used the Internet to get orders for their products and services, and 8 per cent to pay for goods and services. The same percentage used the Internet to conduct electronic financial transactions with their clients. The share of purchases made via the Internet in the last five years grew from 5 per cent to 7 per cent. The same happened to the sale of goods via the Internet.

The further spread of the Internet is hindered by the same obstacles faced by personal computers. Although more money has become available in recent years, 33 per cent of enterprises considered the lack of funds as the most important obstacle. Eight per cent of enterprises believe that the most important obstacle to a greater use of the Internet is the lack of qualified ICT staff, while 5 per cent pointed to an insufficient skill level among their employees, another 5 per cent to the inadequate quality of connections and yet another 5 per cent to inadequate data protection tools.

In 2005, enterprises spent 215.3 billion rubles on ICTs, 10 per cent less than in 2002, in fixed prices. An analysis of the structure of ICT expenditures reveals that fewer computers were bought in this four-year period, with the share of expenditures decreasing from 49 per cent to 37 per cent. On the other hand, there was an increase in expenditures on communication services, from 22 per cent to 26 per cent, and on services by external ICT consultants provided by companies and individuals, from 9 per cent to 16 per cent. The share of expenditures on staff training to facilitate the development and use of ICT remains practically unchanged and very low at 1 per cent. The share of expenditures on software decreased from 14 per cent in 2002 to 10 per cent in 2005. Statistical indicators illustrating ICT use by Russian enterprises are provided in table IV.4 of the annex.

V. Training ICT professionals at Russian higher education institutes

Having a well-educated labour force is crucial for making and keeping an economy competitive in the global information society. Therefore, information about the availability of trained ICT professionals and their skills are important indicators for monitoring the development of the society and, potentially, for shaping policy.

In the Russian Federation, primary, secondary and higher education institutes submit federal statistical monitoring forms with information about their assets and equipment, the number of students who have been admitted and who have graduated, the number of teachers, etc. However, these questionnaires do not include questions on information technology related aspects, nor on the content of and changes to the curricula, in particular with regard to the training of ICT professionals.

As part of this project, a methodological proposal for the statistical analysis of ICT professionals' training was elaborated and a sample survey of higher education institutes that train students for ICT related professions was conducted.

A. Identifying ICT related skills and professions

Before carrying out a statistical analysis of the training of ICT professionals, a unified systematic list of ICT related skills and professions available at higher education and training institutes must be developed.[11] At the moment, such a universally accepted list does not exist in the Russian Federation, so different criteria are used in different situations: various ICT professions or subject areas whose curricula include training to ICT related skills.

As part of this project, a list of 68 graduate-level ICT related professions and subject areas were identified, based on the current Russian Classification of Professions by Education (RCPE) (see table V.1 of the annex). The professions and skills listed were selected if they involved: training students for future work in the ICT sector, extensive knowledge of programming and informatics, telecommunications, and the ability to work at various stages of design and exploitation of information systems, including in enterprises that do not only develop ICT but also offer implementation, installation and maintenance services.

The structure of the list reflects the layout adopted by RCPE but also allows for the selection of narrower groups of ICT related professions, for example in telecommunications and information systems design.

B. Statistics regarding the training of ICT professionals

The level of ICT training received at higher education institutes was assessed on the basis of the above list and data collected through official statistical questionnaire forms number 3-NK "Information about state (municipal) higher education institutes" and number 3-NK (NOU) "Training of graduate-level professionals at non-governmental training institutes".

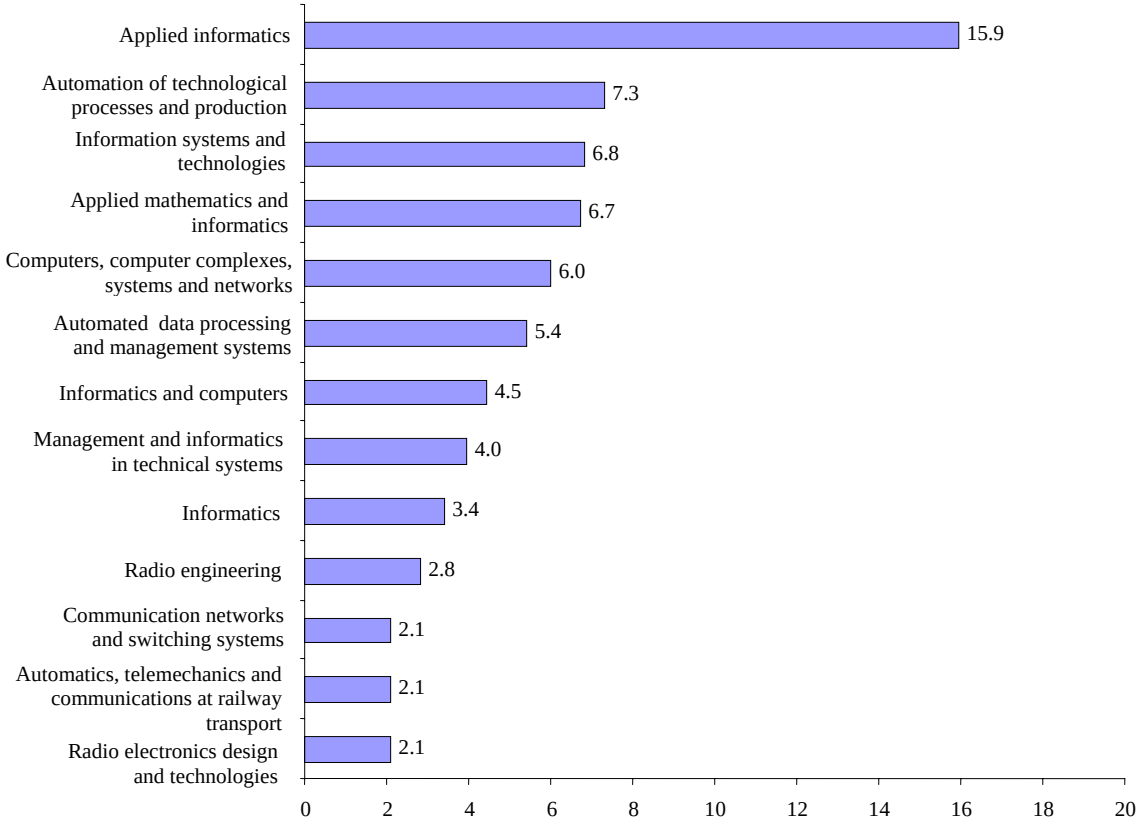
At the beginning of the 2005-2006 academic year, 525,993 students were studying at Russian higher education institutes with the aim of entering ICT related professions; that is, 7.4 per cent of the total number of students. Compared with the previous academic year, the

[11] There are three levels of qualifications in the Russian higher education system: Bachelor (at least four years of training), Professional (at least five years of training) and Master (at least six years of training, after being awarded a Bachelor degree). Graduates with Bachelor and Master degrees are trained in academic subject areas, while those with Professional degrees receive vocational training.

number of future ICT professionals grew by 16 per cent and accounted for 9 per cent of all professions and subject areas. The ratio of admissions to graduations also points to the growing popularity of ICT related professions: while 130,091 ICT students were admitted (representing 7.9 per cent of all students admitted to higher education institutes), 82,599 ICT students graduated that same year (representing 7.2 per cent of all graduates in the country).

The vast majority, 94 per cent, of ICT professionals are trained at state higher education institutes. For all professions and subject areas, this figure is 85 per cent. The most popular ICT related professions in the Russian Federation are shown in figure 10.

Figure 10. Most popular ICT related areas chosen by ICT students, 2005-2006 academic year



Source: Institute for Statistical Studies and the Economics of Knowledge, HSE

The numbers of students by ICT related graduate-level professions and subject areas are given in table V.2 of the annex.

C. Statistics regarding higher education institutes that provide ICT training

A sample survey of higher education institutes where students are trained to enter ICT related professions was carried out to obtain more detailed information about the conditions and quality of training available to students and about the level of demand for them in the labour market. The objective was to obtain reliable, high-quality statistics on various aspects of professional ICT training at Russian higher education institutes. The study included analyses of the following indicators:

(a) Number of students who were admitted and who graduated;

(b) Assets and equipment held by higher education institutes;

(c) Access to information and other resources by staff at higher education institutes;

(d) Qualifications and age structure of teachers;

(e) ICT use at higher education institutes;

(f) Updating of curricula;

(g) Role of higher education institutes in providing graduates with job placements.

The higher education institutes that took part in the survey were selected from those that had submitted official statistical questionnaire forms number 3-NK and number 3-NK (NOU). Sixty higher education institutes from 30 regions of the Russian Federation that train students for ICT related professions and subject areas were selected (see table V.3 of the annex).

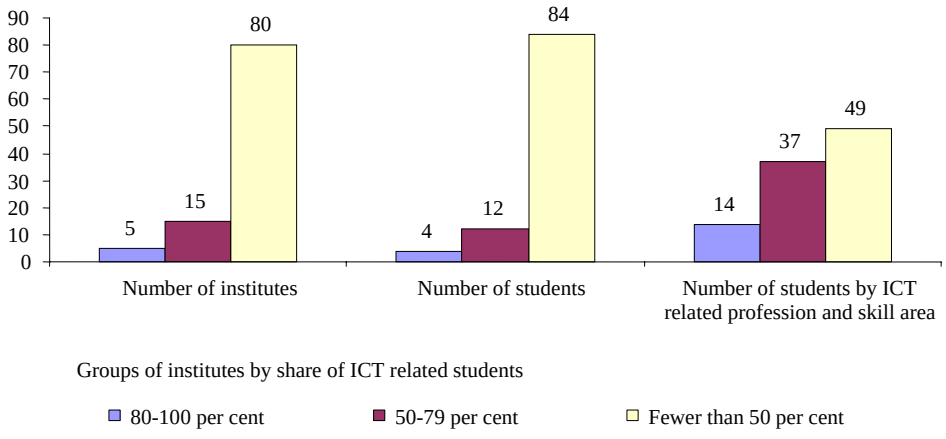
One fifth of Russian ICT students were enrolled in one of these institutes, as were practically all (90-100 per cent) ICT students receiving training in applied informatics, computers and automated systems software, micro-systems devices and ship control systems, for example. In other words, the study covered practically all higher education institutes that train such professionals.

The surveyed higher education institutes do not specialize in training ICT professionals. In fact, at only 5 per cent of the institutes did the share of ICT students exceed 80 per cent of the total student body. At 15 per cent of the institutes, the share amounted to 50-79 per cent. Thus, ICT students are dispersed among various institutes that train students for a wider range of skills and professions.

Distribution of the surveyed higher education institutes by share of future ICT professionals is given in figure 11.

Figure 11. Distribution of higher education institutes training ICT professionals by the number of students being trained in these skills

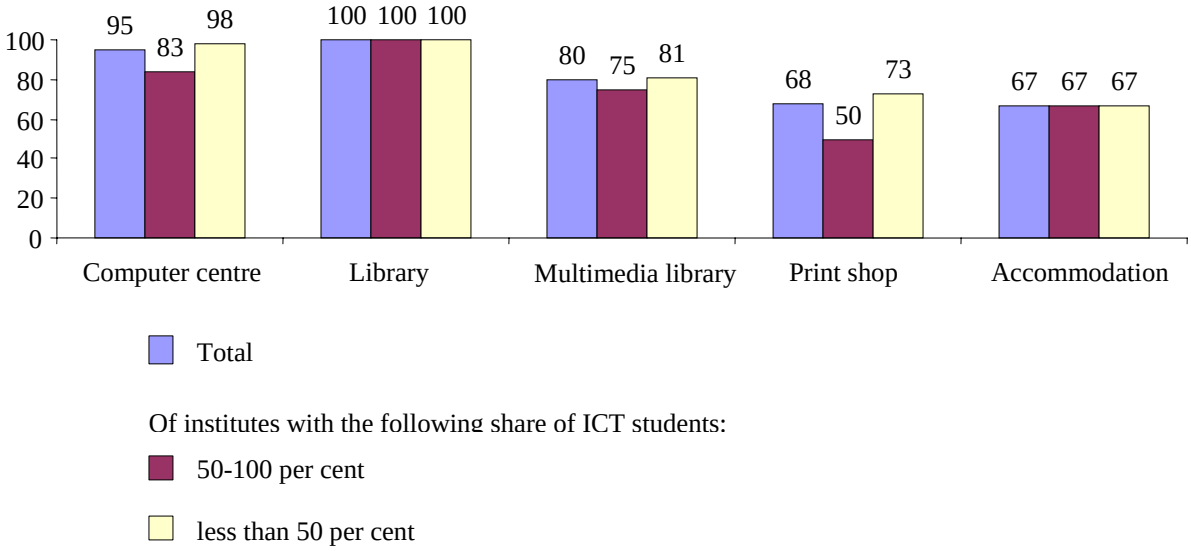
(Percentage of the appropriate figure for all surveyed institutes)



Source: Institute for Statistical Studies and the Economics of Knowledge, HSE.

All surveyed higher education institutes had libraries, 80 per cent had multimedia libraries, 95 per cent had a computer centre, 68 per cent had print shops and 67 per cent had student accommodation (see figure 12). It should be noted that highly specialized institutes with over 50 per cent of students being trained for ICT related professions had below-average availability of multimedia libraries, computer centres and print shops; this hardly meets the modern requirements for good quality training, especially in such a dynamic sector as ICT education.

Figure 12. Percentage of higher education institutes training ICT professionals with appropriate assets and equipment



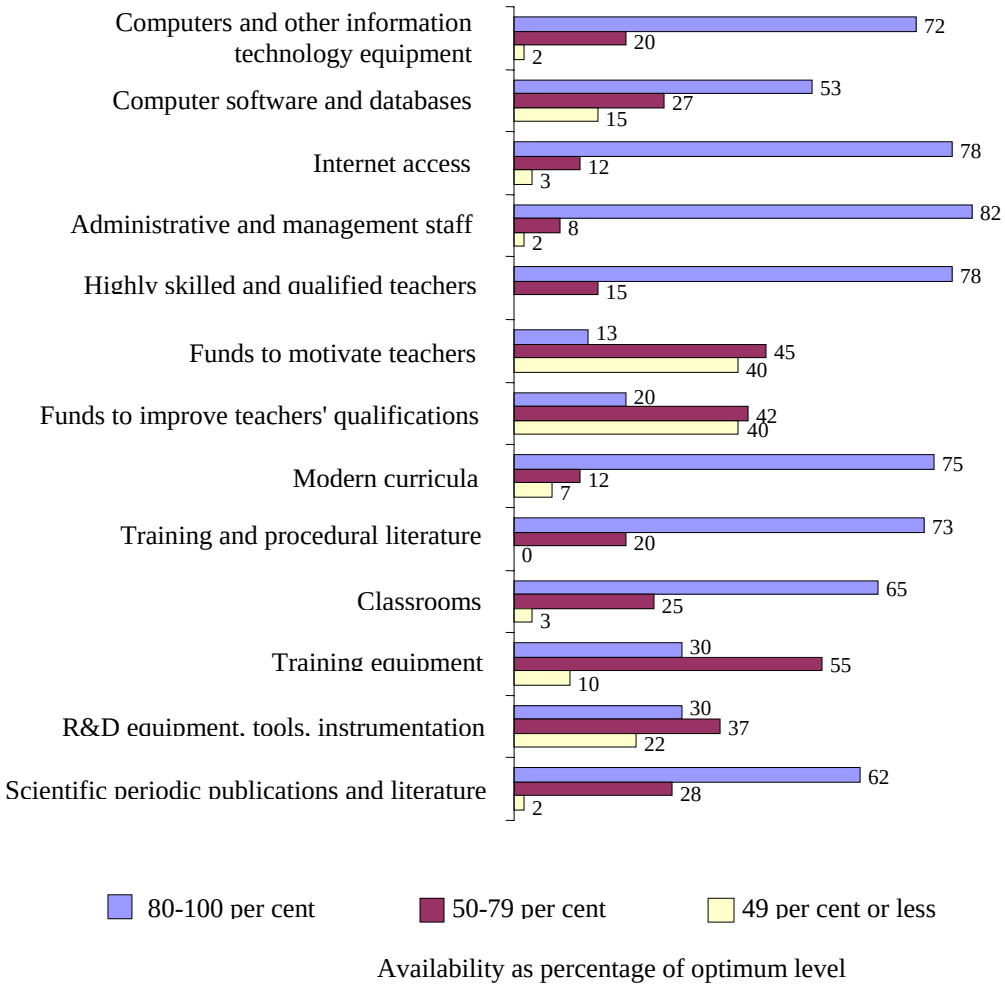
Source: Institute for Statistical Studies and the Economics of Knowledge, HSE.

The institutes' management was asked to rate the computer stocks, the level of teachers' qualifications, the availability and quality of classrooms, etc. The evaluation was done by estimating the quantity of available resources as a percentage of the optimum quantity of resources. Supplementary data obtained by HSE in another survey on the economics of education was also included in the analysis.

The managers of higher education institutes were not especially enthusiastic about their personnel and information resources. Generally, the availability of computers and other information technologies was rated at 78 per cent of the optimum level, computer software at 67 per cent, and Internet access at 82 per cent. These managers rated as "low" the possibility of using funds to motivate teachers (44 per cent of the optimum level) and improve their qualifications (48 per cent). Availability of sufficiently qualified teachers was estimated at 83 per cent of the optimum level. Availability of R&D equipment, tools, instrumentation and scientific literature was rated rather highly, at 90-92 per cent. Figure 13 shows the distribution of institutes by rated availability of main resources.

Figure 13. Distribution of higher education institutes training ICT professionals by rated availability of resources

(Percentage of surveyed institutes)



Source: Institute for Statistical Studies and the Economics of Knowledge, HSE.

In the surveyed higher education institutes, most teachers (49 per cent) were between 40 and 59 years old. Of those at either end of the range, 14 per cent were under 30 years old and 15 per cent were 60 years old or older.

The turnover rate of teaching staff—measured as the ratio of teachers hired during the monitoring period to the total staff body—was of 15 per cent in the last five years. Of this group, only 3 per cent were under 30 years of age. Usually, they were graduates of the institutes where they were hired to teach.

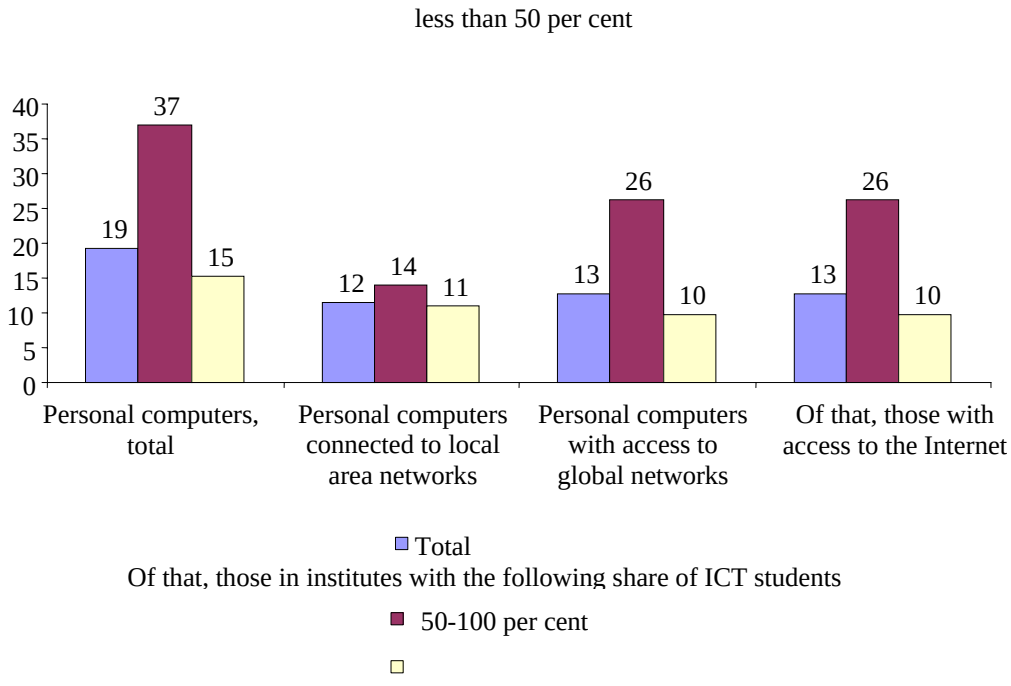
The study also investigated how often teachers publish academic papers and training materials, and found that 73 per cent of teachers at higher education institutes had been published during the previous two years. Six per cent of them had published textbooks and training aids approved by the Russian Ministry of Education and Science in over 1,000 copies.

The use of ICTs in training and teaching is a major factor affecting the quality of the training of ICT professionals. Available data indicates that all surveyed institutes had personal computers and Internet access but that the level of ICT use for training and teaching remained rather low. On average, there were 19 computers per 100 students and, of these computers, 12 were connected to local area and global networks. At institutes specialized in training ICT

professionals access to personal computers and the Internet was twice as high as in higher education institutes where less than 50 per cent of students specialized in ICT.

Figure 14. Availability of personal computers for students at higher education institutes specialized in training ICT professionals

(Number of personal computers per 100 students)



Source: Institute for Statistical Studies and the Economics of Knowledge, HSE.

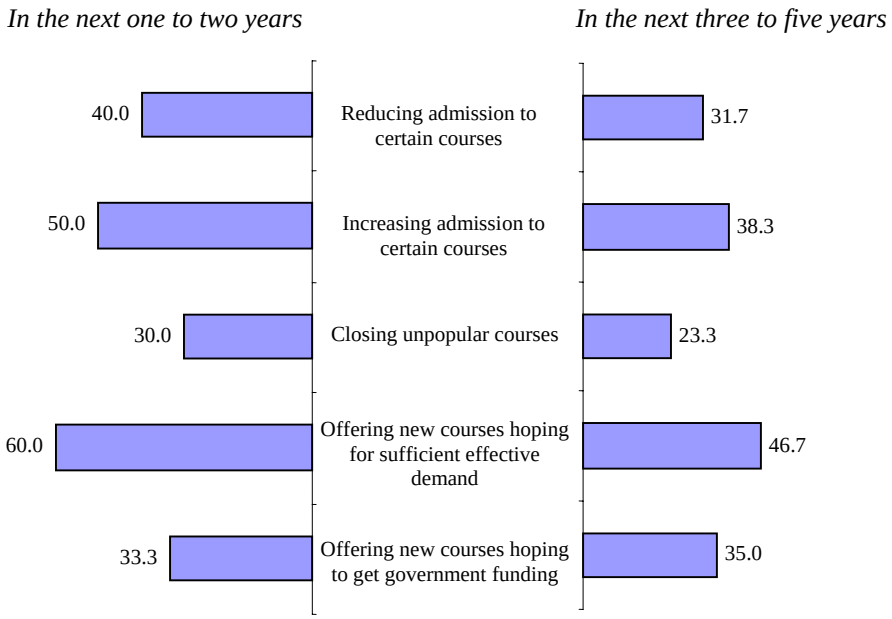
The replacement rate of computers during the previous academic year was 17 per cent; in higher education institutes where ICT students made up between 50 and 100 per cent of the student body, the replacement rate was 26 per cent and in other institutes 13 per cent.

Higher education institutes actively use specialized software. All institutes where ICT students made up between 50 and 100 per cent of the student body reported having specialized software for R&D, training programmes and electronic legal information systems. In institutes where ICT students constituted less than 50 per cent of all students, between 92 and 98 per cent

had access to that kind of software. About 80 per cent of higher education institutes had access to global networks via dedicated (broadband) lines.

Concerning the strategies of higher education institutes that train ICT professionals, about 80 per cent of them intend to develop their curricula (figure 15). Half of the institutes intend to admit more students for individual courses in the next one or two years; 60 per cent are going to offer new curricula hoping the effective demand will be sufficient; 33 per cent of higher education institutes intend to offer new curricula funded by the government. Forty per cent of the institutes intend to reduce the admission of students for certain curricula during the next one or two years.

Figure 15. Percentage of higher education institutes training ICT professionals that intend to change their curricula

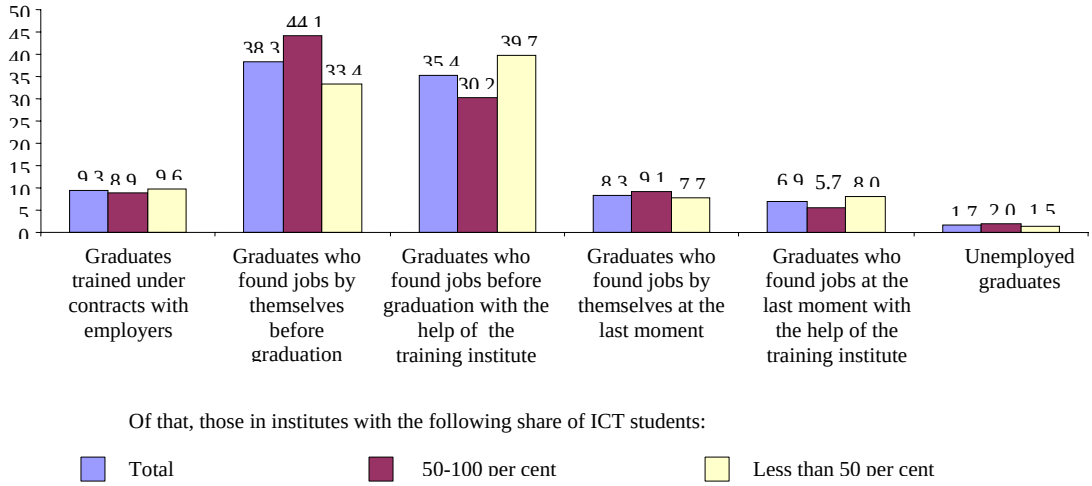


Source: Institute for Statistical Studies and the Economics of Knowledge, HSE.

Seven of the 60 surveyed institutes (12 per cent) guaranteed job placements for their graduates. About 17 per cent of students were studying at one of these seven institutes. Forty-seven per cent of higher education institutes had signed contracts with enterprises to place their graduates; 83 per cent of all students trained there. Other steps taken by institutes to provide graduates with job placements include the organization of career days (48 per cent of institutes) and job fairs (65 per cent), and maintaining contacts with job centres (52 per cent).

Mainly, higher education institutes cooperate with potential employers by arranging hands-on training for students at the enterprises (93 per cent of institutes); inviting the representatives of enterprises to deliver lectures or conduct training sessions (78 per cent); raising funds to acquire equipment or to repair and maintain buildings (47 per cent); arranging for teachers' practice at the enterprises (47 per cent); and providing employers with opportunities to encourage the best students and reward them for their work (45 per cent). One third of institutes receive funds from enterprises to finance courses and use the training facilities of the enterprises.

Figure 16. Percentage of ICT graduates given job placements



Source: Institute for Statistical Studies and the Economics of Knowledge, HSE.

The development of more detailed statistical studies on the training of ICT professionals at higher education and vocational training institutes requires a reliable database containing the following information:

(a) Demand for and supply of ICT professionals and skilled ICT users;

(b) Quality of the training of ICT professionals at secondary and higher vocational training institutes, and their ability to meet the expectations of the employers;

(c) The training conditions of ICT professionals at secondary and higher vocational training institutes.

In order to understand better the potential for development of the human skills base in the Russian Federation, the survey on ICT training at higher educational institutes is deemed very important since the skills and qualifications of the work force are crucial to a country's ability to compete in the global information society. It is important to develop further the methodology and integrate the survey into the future framework of both educational and information society statistics in the Russian Federation.

VI. ICT use by households and individuals

One of the main areas of information society statistics comes from analysing the extent to which the population uses ICTs. OECD countries have extensive experience of such studies (see section I). As of 2002, surveys on ICT use by households and individuals have been conducted in the European Union in accordance with standardized methodologies. Information about the extent to which the population has access to and uses ICTs is needed to promote the development of relevant skills and to speed up economic growth: the better the skills and the larger the share of the workforce that can use advanced information technologies, the higher the chances a country has to compete successfully in international markets. Furthermore, access to and use of ICTs has become an integral component for measuring the quality of life of people in an information society. In many OECD countries, such surveys are conducted regularly and include questions about Internet access, frequency and reasons for using it, e-commerce, e-skills and barriers to the further spread of ICTs among the general population.

In the course of implementing the EU-UNIDO-HSE project, HSE developed and tested a number of internationally compatible indicators and obtained data that makes it possible to analyse ICT use by the Russian population, to identify the general trends and specific features, and to compare the results with developments in other countries.

A. International practices and the Russian experience

The following internationally accepted indicators of ICT use by the population reflect differences between countries and, equally importantly, between various social groups in each country:

(a) Use of advanced technologies for higher-quality Internet access;

(b) Degree to which the Internet's potential is exploited;

(c) Degree to which traditional ways of socializing, communicating, working, entertaining oneself and others, searching for information and shopping, for example, are substituted with new Internet-based forms;

(d) Factors promoting or hindering greater availability of ICTs to the population.

To make data on ICT use by the population compatible, appropriate surveys need to be conducted on the basis of a unified methodology. This principle is most fully implemented in the European Union, where the same questionnaire (albeit regularly updated and revised) is used every year. Any changes to the questionnaire are discussed by representatives of the statistical services of the member states within the framework of the appropriate Eurostat working group and approved collectively. Possible areas for further development of statistical studies are discussed in advance, three to four years before the appropriate changes are introduced. For example, in 2006 a special e-government module was implemented but monitoring of electronic business processes is only scheduled to begin in 2008.

To adapt to and reflect the rapid change in ICTs, a modular questionnaire structure is being used and surveys are conducted in the form of monitoring (see section I). The surveys take place annually and the questionnaire is divided into modules, in other words questions grouped by theme. When new technologies emerge, not only can the multiple choice answers be changed, but so can the questions in the questionnaire. For example, since 2006, mobile telephones have been mentioned in European surveys as a way of accessing the Internet because this form of access is becoming increasingly popular.

The questionnaire contains information about factors affecting the spread of ICTs among the population, including sociodemographic, geographic and culturally specific features of various countries and social groups. Accordingly, the current main thematic groups of questions (modules) contained in surveys on ICT use by households include the following:

(a) ICT access by households (availability of computers, Internet access including broadband, mobile telephone, etc.);

(b) Use of computers and the Internet (access points, activities of users, reasons for use);

(c) E-commerce (activity and barriers);

(d) ICT skills (ranged by difficulty).

In the Russian Federation, the share of Internet users among the population is lower than in industrialized countries, but this figure is growing very quickly. According to statistical surveys carried out in 1998, the share of Russians who had, at some point, used the Internet did not exceed 7 per cent; five years later, this figure almost doubled to 13 per cent (Gokhberg and Shuvalova, 2004; Shuvalova, 2005). Three years after that, in 2006, a new survey conducted by HSE revealed that this figure had grown to 21 per cent.

Such studies are important in the Russian Federation for several reasons. On the one hand, the ability of the workforce to use the most advanced information technologies increases the competitiveness of Russian companies. On the other hand, Internet use opens up new opportunities for the Russian Federation's integration into the international community, making such barriers as high costs and huge distances less important. The Internet allows people to access more information than is provided by television, newspapers and magazines. Despite the low level of ICT availability, the prospects of overcoming the "digital divide" in the Russian Federation are quite good, thanks primarily to the population's relatively high level of basic education and the government's efforts to create ICT infrastructure in secondary and higher education sectors.

Eight years ago, it would have been pointless to carry out detailed representative surveys of Russian Internet users since this group was new and still very small. The results would have been comparable with typical sampling errors. Accordingly, work in this area concentrated on researching public opinion regarding the Internet and computers. A 1998 survey showed that at that time there was a strong prejudice against computers and opinions about them were strongly polarized. There was practically no interest in the Internet at all. Only 5 per cent of households had computers at home, and very few people, 2 per cent, intended to buy one in the near future. Thirty-eight per cent agreed with the statement "I like computers", while almost as many, 34 per cent, disagreed with it. Sixty-four per cent of those surveyed did not agree with the statement "I am very interested in the Internet", as opposed to 13 per cent of enthusiasts.[12]

The turning point in public opinion came only after 2000. By 2003, the Russian Internet audience had become large enough to warrant representative sociological studies. Research into ICT availability and use is becoming a prestigious specialization for many public opinion research agencies (almost like political ratings), with the results being published on their Internet websites. For example, according to Romir Monitoring, at the beginning of 2003, 10 per cent of the population in the Russian Federation used the Internet and by the summer of 2006 this percentage had grown to 22 per cent (Romir Monitoring, 2006). According to the Public Opinion Foundation, by the autumn of 2002 about 8 per cent of the adult Russian population was using the Internet, and by the autumn of 2006 this figure had reached 23 per cent (POF, 2006a).

[12] The All-Russian Public Opinion Research Centre archive.

However, the range of questions in such polls is usually quite narrow, targeting the number of users and the frequency and location of use. Only occasionally are questions asked about the ICT skills of the population. Additional research is required to analyse in detail the reasons behind the spread of ICTs among the Russian population.

HSE has been engaged in studying the factors affecting the spread of ICTs among the population for several years. A survey conducted in 2003 demonstrated a contradictory attitude towards ICT dissemination. On the one hand, people had a very weak perception of computerization and the development of the Internet as factors contributing to economic growth. At the same time, most of the surveyed persons were aware that the Russian Federation was behind developed countries regarding the availability of computers and the development of the Internet, and expressed displeasure with the level of government support for the information technologies sector. Respondents noted that the computer programming profession enjoyed a very high level of prestige in the Russian Federation: half of those surveyed said they would like their children to become programmers. The same contradiction existed regarding respondents' personal needs in the ICT area. Twenty per cent of respondents expressed the need for additional computer knowledge and skills, while only 1 per cent had actually participated in computer-related training in 2002. Thirty five per cent of those surveyed said they would like to buy a personal computer, but only 9 per cent had one at home.

The main reasons for not owning a computer included lack of money (52 per cent) and/or no need for a personal computer (31 per cent). In general, people did not have a negative attitude towards personal computers (5 per cent were afraid of dangerous radiation, 6 per cent believed computers were bad for the eyes, less than 1 per cent feared breach of confidentiality regarding computer-stored information). Very few people doubted they would be able to learn how to use a computer (3 per cent).

As to the skills, only 25 per cent of respondents had ever used a personal computer and one eighth the Internet. A much more important finding, at that time, was what people knew about the opportunities offered by computers and the Internet. It turned out that half of the respondents had practically no idea about the potential of personal computers (47 per cent). The other half knew that computers allowed users to print texts (49 per cent), one third knew that computers could be used for educational purposes (34 per cent) and to communicate via e-mail (32 per cent). Most of the other options concerned searches for various kinds of information (between 20 per cent and 27 per cent). Respondents were least informed about the possibility of drafting legally valid electronic documents, from using a digital signature and filing tax returns (8 per cent) to voting in elections as a crucial part of e-government (4 per cent).

B. Preparing the survey

In 2006, in the course of the EU-UNIDO-HSE project, a representative survey was conducted to analyse specific aspects of ICT availability and Internet use by households. The survey had the following objectives:

(a) To develop a methodology for carrying out internationally compatible surveys for assessing the ICT skills of the Russian population, including a system of indicators and special tools;

(b) To test the methodology and tools by putting them into practice and analysing the results;

(c) To evaluate the efficiency of the techniques and the prospects for making further use of the developed tools.

The system of indicators was developed in accordance with the objectives of the survey. In European Union countries, the definition of ICT skills (e-skills) includes the following elements:

(a) The professional skills required to develop, operate and maintain ICT systems;

(b) The end-user skills needed to efficiently use ICTs at work;

(c) The e-business skills, including the ability to use ICTs, needed to increase productivity at various kinds of enterprises and to introduce new forms of organizational and business processes and new forms of business (European Commission, 2004).

This definition is quite applicable to the Russian situation. Accordingly, tools for the survey were developed on the basis of the three Eurostat questionnaires used to conduct surveys on ICT use by households and individuals in 2005, 2006 and 2007, which are slightly different from each other. In designing the Russian questionnaire, the authors used the widest range of possible answers and included additional options to reflect specifically Russian aspects. For example, the list of "Home information infrastructure devices" was extended and the list of barriers to Internet use was supplemented with "Lack of Internet access opportunities in the area". A question on the reasons for not taking part in e-commerce was also added to the questionnaire. This question was included in the 2005 and 2006 Eurostat questionnaires but was then removed in 2007 since it was considered irrelevant given that European citizens frequently make purchases over the Internet. In other cases, questions were removed owing to the absence or weak presence of certain phenomena in the Russian Federation. The system of indicators developed for the Russian poll includes six modules:

(a) Access to ICTs;

(b) Use of mobile telephones and computers (location and frequency of use);

(c) Use of the Internet (location, frequency and reasons for use);

(d) E-commerce (level of activity and barriers);

(e) ICT user skills, plans to acquire such skills;

(f) Sociodemographic characteristics.

The respondents were asked to fill in the questionnaires themselves. The poll involved 2,407 people aged 16 and above who constituted a representative sample, created in accordance with a multistage layering scheme, of the Russian population. It included 300 people from an additional representative sample for Moscow, which means that 430 Muscovites were interviewed in all. The sample included 110 townships and rural areas from eight Russian republics, six districts (krays) and 25 regions (oblasts).

To make the data even more representative, it was weighted by gender, age, level of education and township size, according to statistical data on the Russian population aged 16 and above for four macro-regions and, separately, for Moscow. To enable an international comparison of the data on computer and Internet use, a sub-group of 2,252 respondents aged 16-74 was selected.

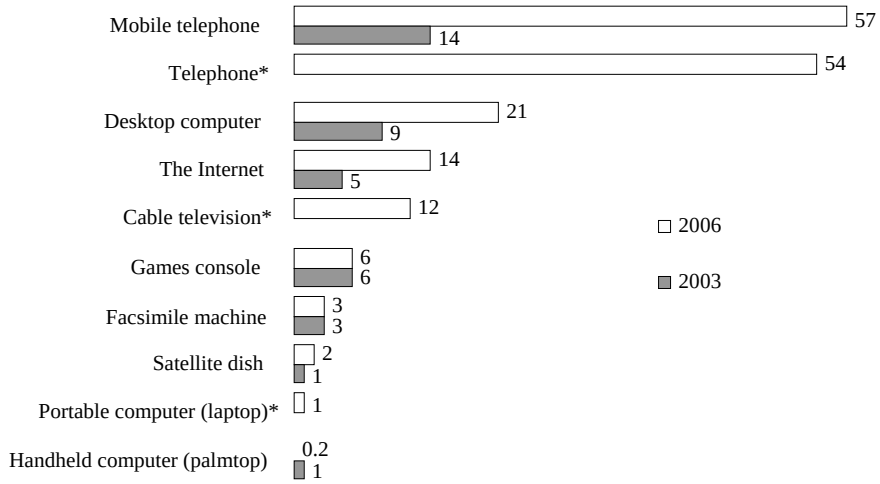
A number of questions about access to ICT by households returned data for all 2,407 respondents since the survey methodology provided interviewing only one member of each household.

C. Access to ICTs in households

In the period 2003-2006, the means to send and receive information in households changed significantly. Ownership of mobile telephones grew most quickly, increasing four-fold, from 14 per cent to 57 per cent. This figure is very important because it reflects households' potential to use mobile Internet: although 53 per cent of respondents aged 16-74 used mobile telephones, only 8 per cent used mobile Internet access at home, at work or anywhere else.

Ownership of computers has increased more than two-fold, from 9 per cent to 21 per cent, while the share of households with Internet access increased three-fold, from 5 per cent to 14 per cent. Still, the Russian Federation is very much behind European Union countries in terms of the availability of personal computers and Internet access by households (section VII).

Figure 17. Percentage of households with ICT devices



* Not mentioned in the 2003 survey.

Source: Institute for Statistical Studies and the Economics of Knowledge, HSE.

The main barrier to buying a personal computer was lack of funds according to 43 per cent of those surveyed in 2006 and according to 52 per cent of those surveyed in 2003. In 2006, 31 per cent did not feel the need to make that purchase, but about the same number (27 per cent) said they would like to buy a personal computer.

The main reason why households had insufficient access to the Internet was the low availability and popularity of the Internet in general: over half of surveyed persons (57 per cent) believed they did not need the Internet at all. However, only 2 per cent of respondents had a negative attitude towards the Internet. Other major barriers identified by respondents included the exceedingly high price of hardware (10 per cent) and of access (8 per cent),[13] and the impossibility of connecting to the Internet in the area or in the building (9 per cent). Only 2 per cent mentioned the lack of skills as a barrier. The same number of people said they had Internet access outside of the home. Only 0.2 per cent of respondents expressed security-related concerns.

[13] Internet users spend, on average, 342 rubles a month (11 per cent of respondents provided information about their Internet access costs).

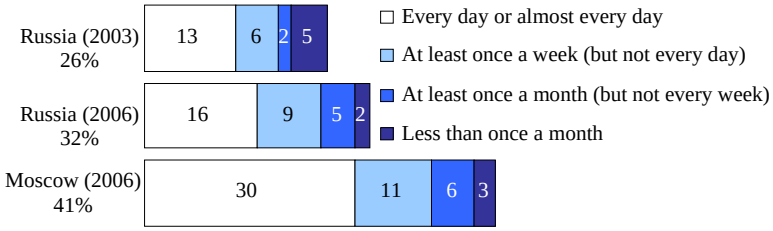
D. Frequency of computer and Internet use by individuals

Over half, or 57 per cent, of Russians aged 16-74 had never used a computer. About 43 per cent of respondents had used a computer at some point in time and only 37 per cent of respondents had used a computer during the previous year. In Moscow, these figures were 1.5 times higher at 61 and 56 per cent respectively. The share of active users, in other words of people who use computers every day or at least once a week, is 25 per cent. In Moscow, the share is 41 per cent (see figure 18).

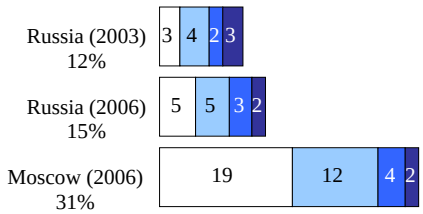
Figure 18. Percentage of respondents aged 16-74 who used the computer and the Internet in the three months prior to the survey, by frequency and location

Frequency

Personal computer

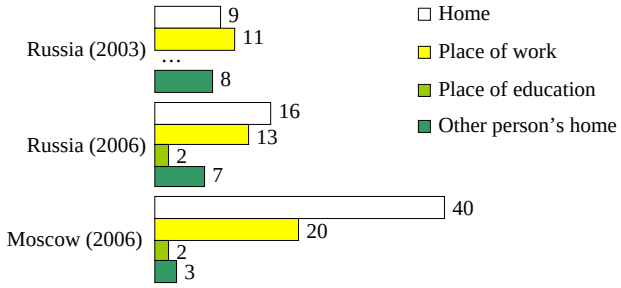


The Internet

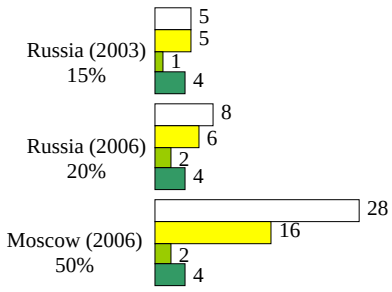


Location

Personal computer



The Internet



Source: Institute for Statistical Studies and the Economics of Knowledge, HSE.

Users were asked to specify where they had used computers most often during the previous three months. The survey indicated a growth in the share of home based computer users compared with those using computers at work. In 2003, the share of people using personal computers at work was higher than that of home users (11 per cent and 9 per cent, respectively) but by 2006 the share of home users overtook the number of people using computers at work (16 per cent and 13 per cent). The share in Moscow was twice as big. Of the respondents, 7 per cent used computers at friends' homes and 2 per cent at educational institutes.

The share of respondents who had never used the Internet is much higher, at 78 per cent. Only 22 per cent of respondents had used the Internet at some point in time and 20 per cent had used it during the previous year. The share of active users, in other words those who use the Internet every day or at least once a week, was 11 per cent.[14] In Moscow, this figure was three times higher: 31 per cent.

As for where the Russian population accessed the Internet during the three months prior to the survey, the share of home users in the Russian Federation was only slightly bigger than the share of people who used the Internet at work (8 per cent and 6 per cent, respectively; in 2003, these figures were identical, at 5 per cent). The figures for Moscow are more than one and a half times greater (28 per cent of home users and 16 per cent of work users). Respondents said they accessed the Internet at friends' homes (4 per cent) and at educational institutes (2 per cent). Public Internet access places were visited by less than 1 per cent of the respondents.

The results clearly show the digital divide between the capital area of Moscow and the rest of the Russian Federation. The citizens of Moscow use personal computers and the Internet far more often and can be characterized as much readier to participate in an information society than the citizens of other parts of the Russian Federation. Nearly one third of Muscovites are frequent users of the Internet, compared to just one tenth of the population in other regions of the country.

E. Reasons for using the Internet

According to 12 per cent of respondents, the most popular reason for using the Internet in the Russian Federation is to communicate by e-mail (see figure 19). Nine per cent of respondents said they had a personal e-mail address.

It is also becoming popular in the Russian Federation to use the Internet to find information or make use of various online services, in particular to view and download games, pictures, music, movies (9 per cent); to search for information about goods and services (6 per cent); to read news, newspapers, magazines (7 per cent); and to download computer software (5 per cent).

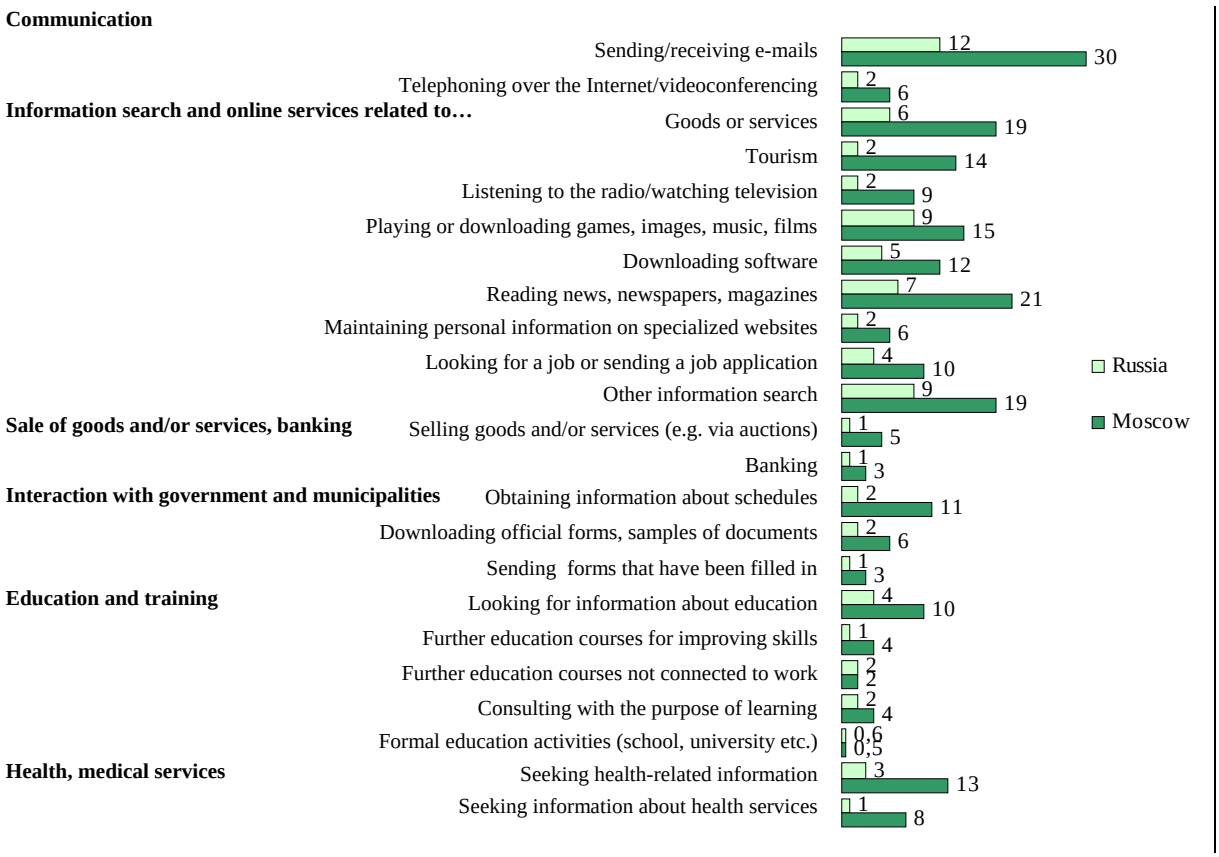
Some uses of the Internet remain practically completely unexploited in the Russian Federation. For example, only 1-3 per cent of domestic respondents mentioned using the Internet for activities such as banking or for searching information about the work of government agencies and about health issues.

[14] The Public Opinion Foundation (POF) and Romir Monitoring report slightly higher figures, probably because their samples did not sufficiently take into account small townships with fewer than 1,000 inhabitants. POF found that 23 per cent of Russians had used the Internet in the six months prior to the survey while Romir Monitoring found that 21 per cent had used the Internet in the previous month. The share of active Internet users was calculated at 15 per cent by POF and at 18 per cent by Romir Monitoring (POF, 2006b; Romir Monitoring, 2006b).

The use of the Internet for education is underdeveloped. Only 7 per cent of Russian respondents noted uses connected to learning. Most often, they mentioned looking for articles or books (4 per cent), while they much more rarely mentioned exchanging e-mails with other learners (1.2 per cent), studying curricula texts online (0.9 per cent) or doing homework (0.8 per cent). Even more rare was consulting tutors via e-mail (0.4 per cent).

Again, huge differences can be observed between Moscow and the rest of the Russian Federation. Muscovites are far ahead with regards to the way in which they use the Internet and how often they use it. For example, Muscovites use e-mail three times more often than other Russians. Regarding the use of search engines, the gap is even wider: people in Moscow use the Internet at least three or four times more often and when it comes to searching for travel and tourist information, they use the Internet seven times more often.

Figure 19. Respondents aged 16-74 using the Internet, by type of use



Source: Institute for Statistical Studies and the Economics of Knowledge, HSE, 2006.

The question about the barriers to a more active use of the Internet revealed that 61 per cent of respondents were not interested in this kind of communication; the second greatest barrier was the high cost of accessing the Internet (according to 15 per cent of the respondents). Other barriers included: lack of knowledge and skills (12 per cent); lack of time (11 per cent); impossibility of accessing the Internet in the area or building (9 per cent); insufficient knowledge of English (5 per cent); slow Internet connection (3 per cent); fear of confidentiality breach or viruses and the perception that the content of the Internet is not especially interesting (1 per cent each).

Problems experienced by respondents while using the Internet most often included infection by computer viruses leading to loss of data (3 per cent) and spam (2 per cent). Much rarer were loss of money owing to credit card fraud or other financial problems, and misuse of confidential information (0.4 per cent each).

So far, e-commerce has not become sufficiently widespread: out of the total sample, only 2 per cent of respondents (52 persons) had bought goods or services via the Internet during the previous 12 months. The most popular goods purchased via the Internet were films and music (bought by 16 of the buyers), and printed materials such as books, magazines, newspapers and educational materials (bought by 14 persons). The second most popular type of goods purchased was home appliances and software (10 people each). Other types of goods purchased online include, in decreasing order: electronic home devices such as mobile telephones, cameras, television sets and music players (8 people); computers and peripherals (7 people); railway and airplane tickets, vacations (5 people); tickets for the movies, the theatre or other shows (4 people). Very few people used the Internet to buy food, footwear or clothes (3 people), to take part in lotteries or to bet at bookmakers' sites (1 person). None of the respondents bought shares, or used financial or insurance services.

Most often, purchases via the Internet were made by Muscovites (10 per cent of those surveyed) and by respondents in the high income group (9 per cent). This figure was above the average for young people aged between 16-24 (7 per cent), for residents of other large cities (5 per cent), managers (10 per cent) and professionals (8 per cent).

The main barrier to developing e-commerce is the lack of demand for this kind of shopping: 14 per cent of respondents noted that they had no need for it and an additional 7 per cent said they prefer to shop in regular stores out of habit and because they need to see what they buy. Very few respondents had doubts about the quality of the goods and services (3 per cent), about the safety of the payment system or about the possibility of returning or replacing the goods (2 per cent each). Only 1 per cent of respondents claimed that a lack of computer skills was stopping them from purchasing online, or that the payment procedure was too difficult. The same number of people said they thought e-shops charged too much.

The Russian questionnaire was supplemented with variations of answers most often chosen by respondents in surveys on Russian Internet users[15]—such as, "I cannot always find what I need (poor supply)"; "There is no information about after sale service"—but they proved to be rather irrelevant for a representative sample (less than 1 per cent of respondents chose any of these options).

F. ICT skills

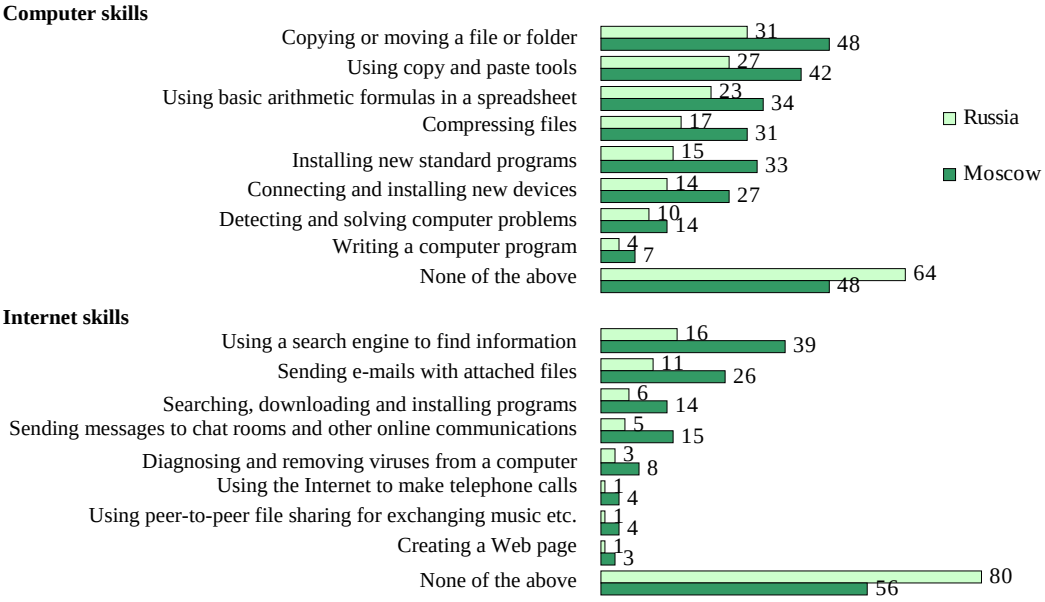
This module of the survey aimed at identifying the proportion of users that had computer and Internet skills, ranked by complexity; their intention to learn such skills; and barriers to carrying out these intentions. The survey showed that two thirds (64 per cent) of respondents aged 16-74 did not have any computer skills and that four fifths had no Internet skills (see figure 20).

More than a quarter of those surveyed could perform basic operations like copying, pasting and moving files (31 per cent) and texts (27 per cent). One fifth (23 per cent) of respondents could perform arithmetic operations in databases. Slightly fewer respondents could handle more complex operations like compressing files (17 per cent), installing new standard applications (15 per cent), installing and initializing new devices like printers or modems (14 per cent). Only 10 per cent of users could solve problems that arose while using a computer and only 4 per cent stated they could write computer programmes using special programming languages. Only

[15] See for example the results of a poll carried out among 2,426 buyers and visitors of online shopping websites aged 14 and above by Romir Monitoring in the first quarter of 2006 (Romir Monitoring, 2006c).

16 per cent of respondents had the most basic Internet skills, such as knowing how to use search engines to find information. The average for respondents in Moscow, however, was 39 per cent.

Figure 21. Percentage of respondents aged 16-74 with computer and Internet skills



Source: Institute for Statistical Studies and the Economics of Knowledge, HSE, 2006.

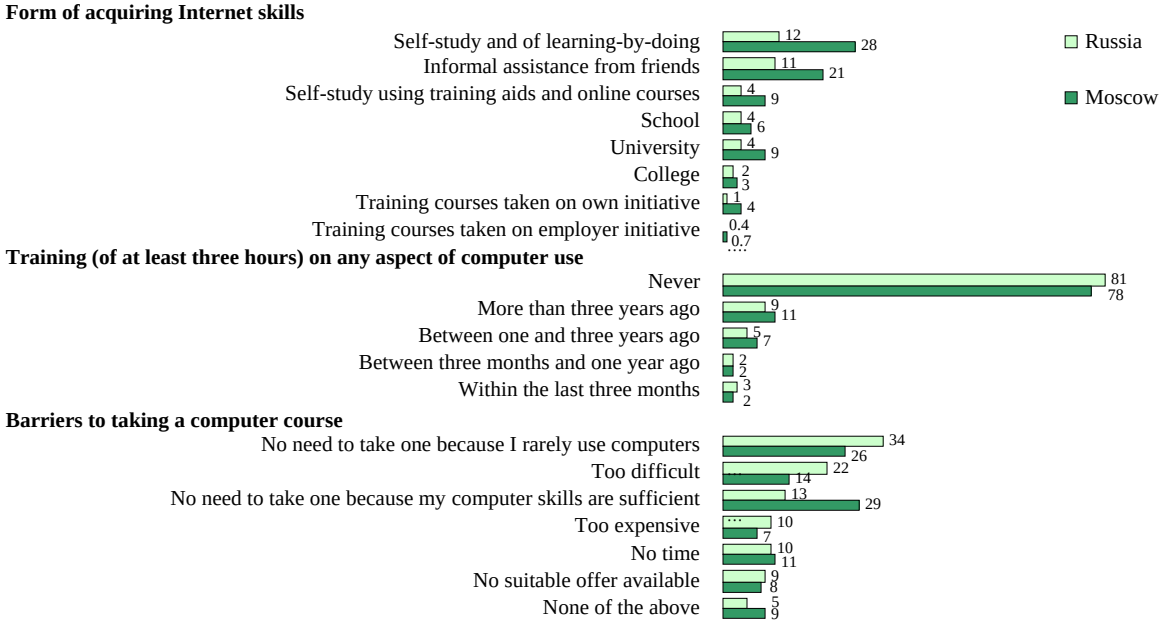
Only 10 per cent of the population in the Russian Federation could send e-mails with attached files, while in Moscow this was true for 26 per cent of the population. Other kinds of communications were used much more rarely: only 5 per cent of Russian respondents used online chat rooms, compared to 15 per cent in Moscow; just 1 per cent made telephone calls via the Internet, while 4 per cent did so in Moscow; and the same number of people used peer-to-peer technology to exchange movies and music. The third most common skill entails knowing how to search for, download and install programs (6 per cent). A great deal fewer respondents were able to locate and remove viruses from a computer (3 per cent), and even fewer (1 per cent) could open Web pages.

Most commonly, Internet skills are self-taught, as proven by the fact that 12 per cent of those surveyed (and 28 per cent of the Moscow sample) chose the option “Taught myself by doing”. Another 11 per cent chose “Learned with the help of colleagues, friends, acquaintances” (see figure 21). Very few respondents (4 per cent of all surveyed Russians and 9 per cent of Muscovites) acquired their e-skills with the help of training aids (textbooks or compact disks) or of online Internet courses.

Also low was the level of e-skills learned at educational institutes: 4 per cent of respondents said they were taught at general schools, 3 per cent at colleges and 2 per cent at primary vocational schools. Altogether, 8 per cent of those surveyed acquired their Internet skills at educational institutes (compared to 16 per cent for the Moscow-based group). In the specially selected sub-group of students (135 persons), only one third of the sample named educational institutes as the source of their Internet skills, while almost half noted that they taught these skills themselves or with the help of friends. Finally, 38 per cent of students had no Internet skills at all. This data indicates that ICTs are not widely available nor efficiently used at educational institutes.

Figure 22. Respondents aged 16-74, by means of learning e-skills

(Percentage)



Source: Institute for Statistical Studies and the Economics of Knowledge HSE, 2006.

About 1 per cent of respondents attended special training courses on their own initiative, while just 0.3 per cent was sent to such courses by employers (in Moscow these figures are 4 per cent and 0.7 per cent, respectively).

Nine per cent of those surveyed had completed some kind of special training in this area (even if only a three-hour training session) during the previous three years. Of these, one third had done so in the previous three months, one quarter between three months and one year previously and one half between one and three years prior to the survey. Another 9 per cent of respondents had undergone such training more than three years ago. The share of respondents who had never received any special Internet related training is 82 per cent.

In answer to the question “Why haven’t you learned to use a computer?” respondents most often replied that they use computers only rarely (in 34 per cent of cases) or that it is too difficult (22 per cent). About one in every 10 respondents pleaded lack of money, time or acceptable offers, and 13 per cent said they already knew how to use computers.

The survey proved that the Eurostat methodology is generally applicable to a study of ICT use in Russian households. The data obtained shows that this process is just beginning in the Russian Federation, but also that it is moving fast. The main barriers preventing the population from taking part in it can be overcome. The problem is not so much the lack of skills or funds, but the lack of a “critical mass” of users, and the lack of an “Internet trend”. It should be noted that the obvious prejudice against the Internet that was very much in evidence a decade ago is now a thing of the past.

Practically all variants of the answers to all the questions in the questionnaire were chosen by respondents, with only one exception: not a single person used the Internet to buy shares, financial or insurance services for themselves during the year leading up to the survey.

In the Russian Federation, the least popular uses for the Internet were e-commerce and interaction with government agencies (e-government): only 1 to 2 per cent of respondents did

that. But, even here, there are signs that growth is speeding up, mainly owing to the increasing tendency of Muscovites to make purchases via the Internet and to obtain information from public bodies, thus establishing a domestic base for businesses and public bodies to offer such services. The Russian population, with Moscow's inhabitants at the forefront, is rapidly developing into an information society and using the opportunities offered by the Internet to engage in a variety of activities, from communicating with others to purchasing goods and services.

VII. First benchmarking of the information society in the Russian Federation

The dynamic growth of ICTs has been a decisive factor in the global economic and societal development in the last decades. Owing to their pervasiveness, ICTs affect the way we organize the production of goods and services, the content of jobs, and the relationship between different economic actors (citizens, enterprises and the public sector). Technology even affects the way we organize our private life and use our time.

By continuously developing and introducing new features and possibilities at an incredible speed, ICTs have created an urgent need for policymakers globally to collect information about this driving force. Modern society has been turned into an information society where citizens and enterprises are always connected and online, the world over. But policies cannot be based on anecdotal information drawn from newspapers or on isolated case studies, they must be made on evidence collected from reliable and official statistical information that is, in turn, based on well-defined concepts and methods. In this way, a solid knowledge base can be established and the needs of policymakers can be satisfied.

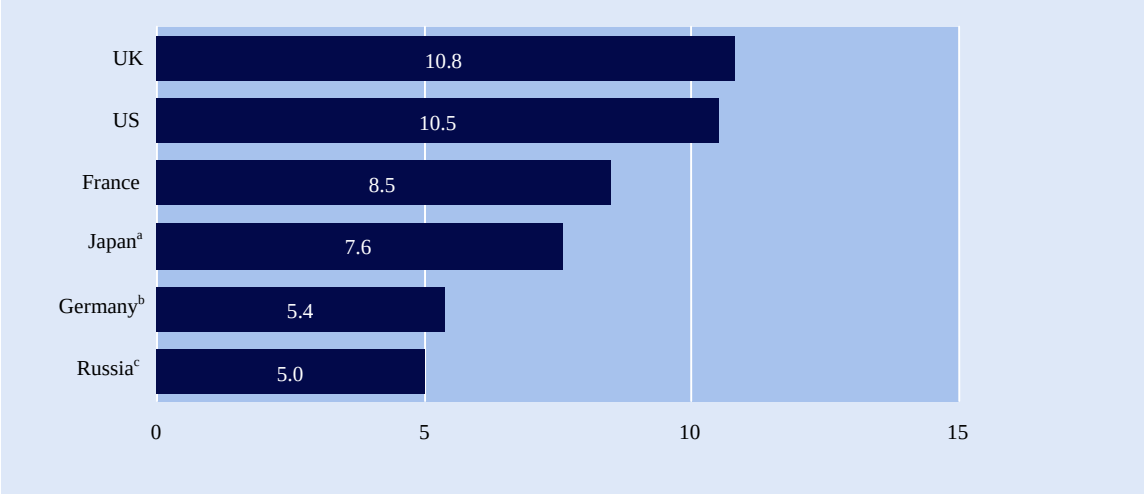
To date, statistics on the development of an information society in the Russian Federation has not been available. The EU-UNIDO-HSE research project aims to bridge this gap by collecting relevant statistics based on international standards. The primary aim of the project is to emphasize the methodological issues over the statistical output in terms of actual figures but some major statistical results of the project can, with caution, be compared with international data regarding information societies. This would allow for a benchmarking of how ready the Russian Federation is to enter the global information society in order to create jobs and growth, and improve the Russian population's ability to participate in and reap the associated benefits.

A. The ICT sector

The ICT sector is a focal point for assessing the maturity of an information society since its development and the outputs it produces—in terms of goods and services—are preconditions for the mere existence of an information society. Furthermore, the sector is characterized by its dynamism: the introduction of a variety of innovative products based on rapid technological development creates many new enterprises and shows an economic performance based on high growth and productivity. Consequently, even if the ICT goods and services are imported, a competitive and durable ICT sector is important for the national economy. The ICT sector in the Russian Federation constitutes 5 per cent of the business sector economy, measured as the share of total added value created in the business sector (see figure 23). This is approximately half the size of the ICT sector in the United Kingdom and the United States.

Figure 23. Value added by ICT as a share of value added in the whole business sector, 2003

(*Percentage*)



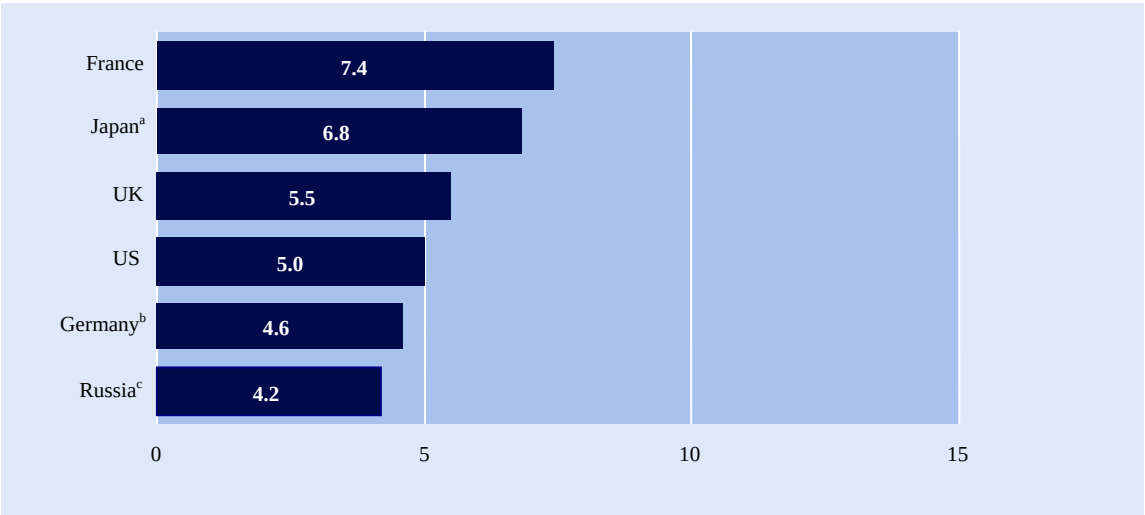
[a] Excluding ICT wholesale trade.
[b] Excluding ICT wholesale trade and telecommunication.
[c] 2005.

Source: OECD Information Technology Outlook 2006 and HSE.

In terms of job creation, the Russian ICT sector is relatively important as it employs 4.2 per cent of all people employed in the business sector (see figure 24). This is not even 1 per cent less than the equivalent share in the United States and only 1.4 per cent less than that in the United Kingdom.

Figure 24. ICT employees as a share of business sector employees, 2003

(*Percentage*)



[a] Excluding ICT wholesale trade.
[b] Excluding ICT wholesale trade and telecommunication.
[c] 2005.

Source: OECD Information Technology Outlook 2006 and HSE.

B. ICT use by enterprises

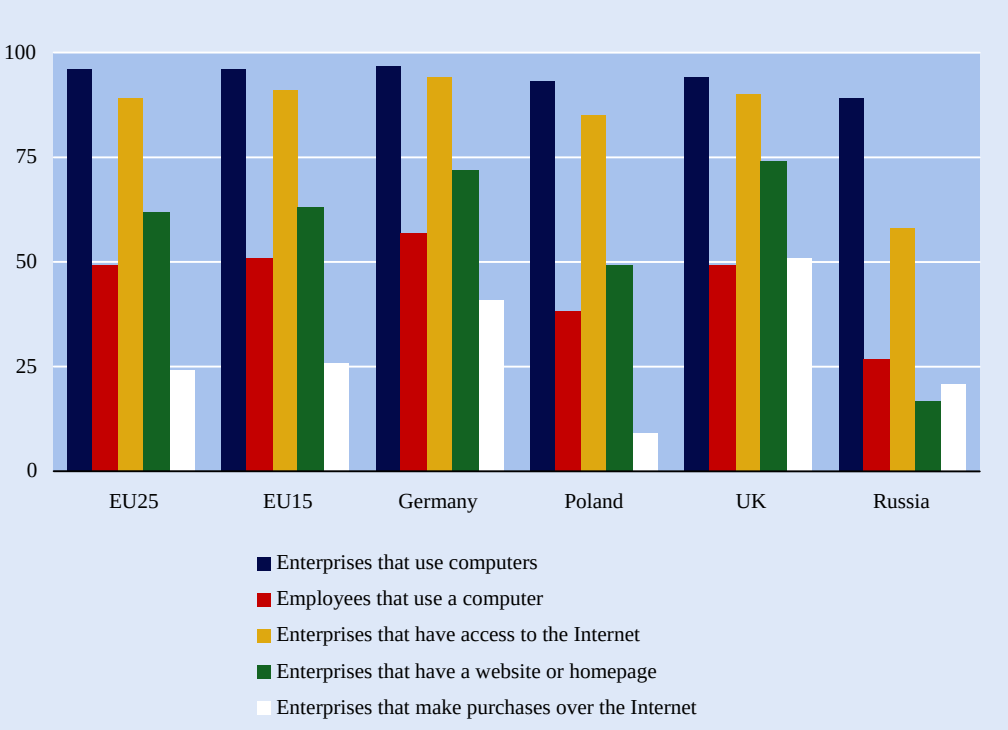
Enterprises in the Russian Federation that operate within the business sector and have at least 10 employees use computers in almost the same way as businesses in other major economies do. However, there are far fewer computers in Russian enterprises: only 27 per cent

of employees in these enterprises use computers, compared to 49 per cent in the 25 member states of the European Union.

Russian enterprises also lag behind the major economies in terms of Internet usage: 58 per cent of enterprises with at least 10 employees in the Russian Federation use the Internet, while this is true for 89 per cent in the 25 member states of the European Union. The gap increases when looking at a more advanced use of the Internet, for more than 60 per cent of European Union enterprises have a website, compared to only 17 per cent in the Russian Federation. Surprisingly, however, the share of enterprises purchasing via the Internet is similar, with 21 per cent of Russian enterprises and 24 per cent of European Union enterprises buying in this way.

Figure 25. Use of ICTs by enterprises in the business (not financial) sector with at least 10 employees, 2005

(*Percentage*)



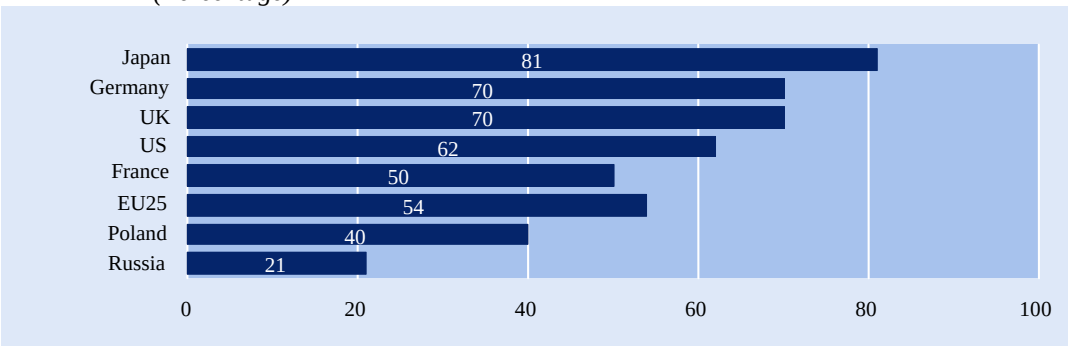
Sources: Eurostat and HSE.

C. ICT use by households

An important indicator of the readiness of a country to become an information-driven society is people's access to a computer at home, for the computer can be considered the basic tool for getting access to information. In the Russian Federation, 21 per cent of households had access to a computer at home compared to 64 per cent of households in the European Union and 81 per cent in Japan, an impressive penetration rate (see figure 26). Based on the developments that have taken place in countries where the use of ICTs is more widespread, a rapid growth can be expected in the Russian Federation. For instance, the penetration rate in France increased from 37 per cent in 2002 to 56 per cent in 2006 (Eurostat website) and the share of households with access to a computer doubled from 2002 to 2004 in Poland (Nordic Council of Ministers, 2005).

Figure 26. Households with access to a computer at home, 2006

(Percentage)

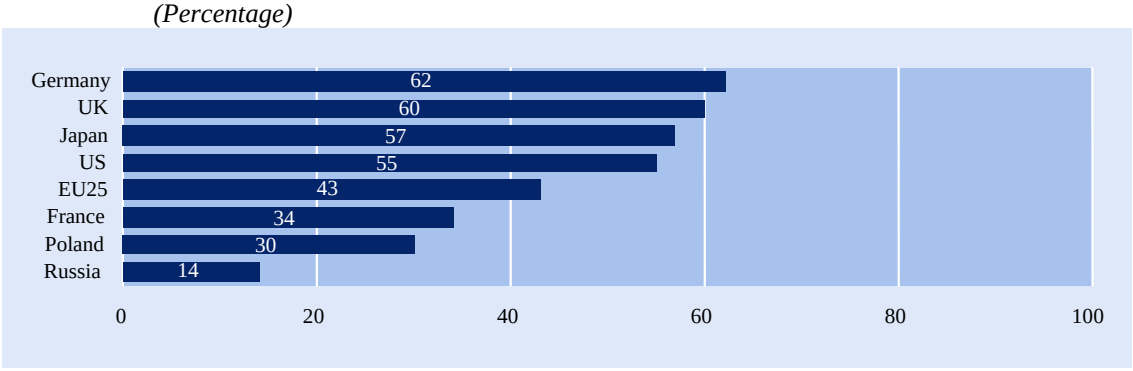


Sources: Eurostat and HSE.

A small share of households in the Russian Federation (14 per cent) is actually connected to the Internet from home, compared to 51 per cent of those in the European Union and nearly two-thirds of households in Germany (see figure 27). Based on the experiences of other European countries, a substantial growth rate can be expected in terms of getting more Russian citizens connected. In France, the share of households with access to the Internet from home nearly doubled between 2002 and 2006 (Eurostat website).

Figure 27. Households with Internet access at home, 2006

(Percentage)

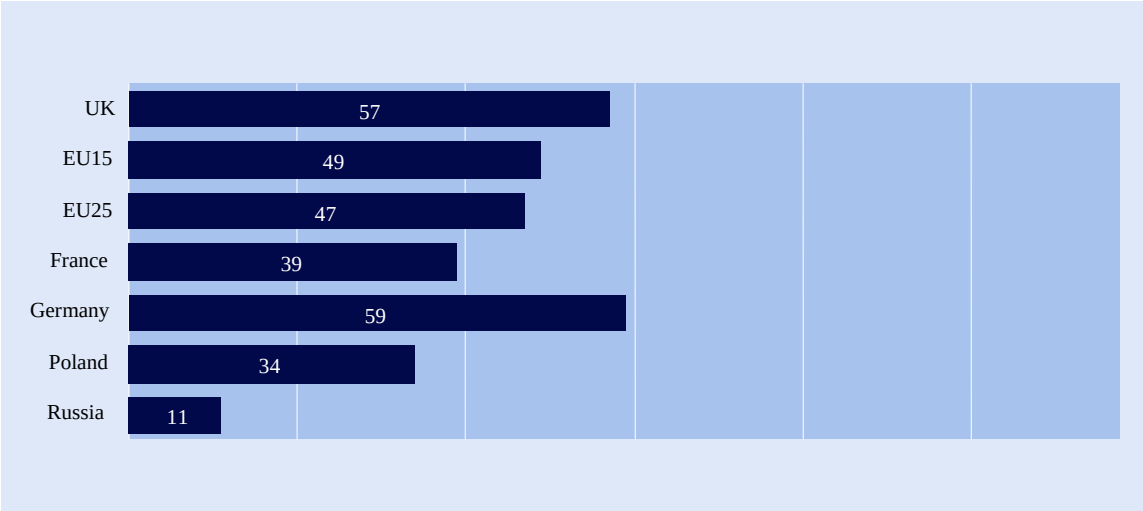


Sources: Eurostat and HSE.

A key indicator of frequency is the regularity with which the population uses Internet. This could also indicate whether a digital divide is being bridged, as in the case of the United Kingdom, where more than two-thirds of the population aged 16-74 uses the Internet at least once a week (see figure 28). In Europe, nearly half of the population uses the Internet frequently, compared to only 11 per cent in the Russian Federation. Thus, it cannot be said that the Internet is a widely used tool in the daily lives of Russians. The Internet is used much less frequently in the Russian Federation than it was in the 15 member states of the European Union in 2003 (the first year that frequency was measured), where more than one third of the population said they used it frequently (Eurostat website).

Figure 28. People aged 16-74 who use the Internet at least once a week, 2006

(Percentage)

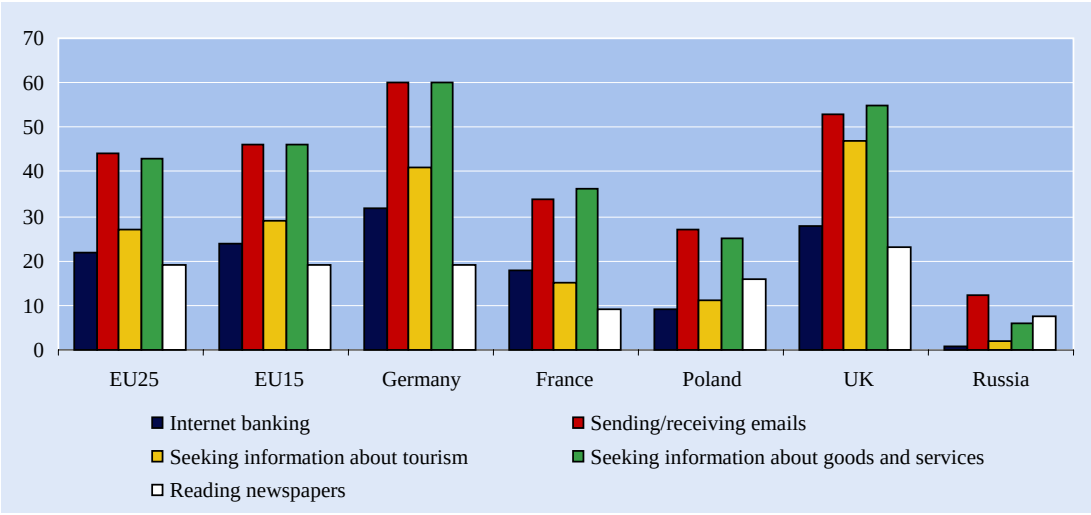


Sources: Eurostat and HSE.

During the initial period of transition towards an information society, the Internet tends to be the basic tool for communication. This has also been true in the Russian the case, where 12 per cent of the population said that e-mailing was the main reason they used the Internet, while only 6 per cent said they used the Internet for seeking information about goods and services (see figure 29). In more mature information societies—such as in France, Germany and the United Kingdom—e-mailing is secondary to seeking information about goods and services. In 2003, 35 per cent of the surveyed population in the then 15 member states of the European Union said that they used the Internet to send and receive e-mails while 29 per cent said they used Internet to seek information about goods and services. This development clearly indicates that, right from the outset, e-mailing has been the major driver for using the Internet and that it is only at a later stage that other activities become a driving force in Internet usage, perhaps also owing to the lack of opportunities.

Figure 29. People aged 16-74 who use the Internet, by activity, 2006

(Percentage)



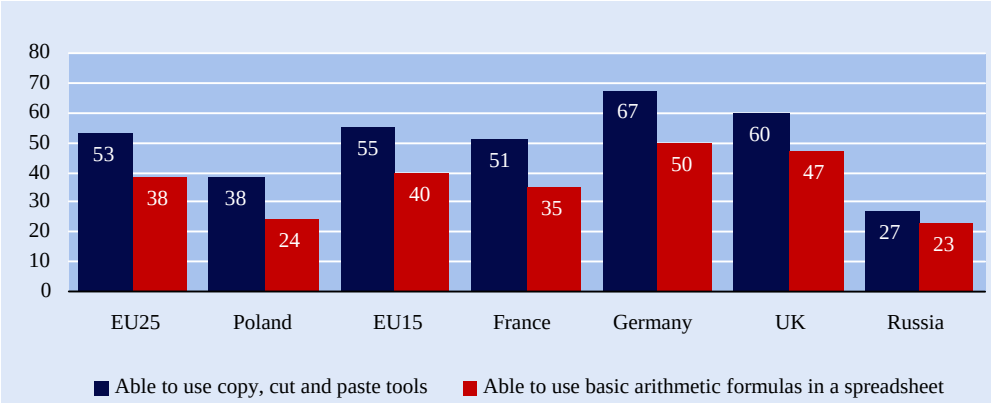
Sources: Eurostat and HSE.

D. E-skills

When focusing on basic computer skills instead of the more practical use of the Internet as part of the daily way of living and acting in a modern information society, we can observe that the gap between Russians and Europeans is narrowing (see figure 30): 27 per cent of the Russian population and 53 per cent of the European population indicated that they were capable of using copy, cut and paste tools. This indicates that Russians are relatively well positioned to make greater use of various computer functions in the future even if they do not currently have access to a computer at home and that computers are increasingly being considered the primary tool for citizens and employees operating in an information society.

Figure 30. People aged 16-74 who have basic computer skills, 2006

(Percentage)

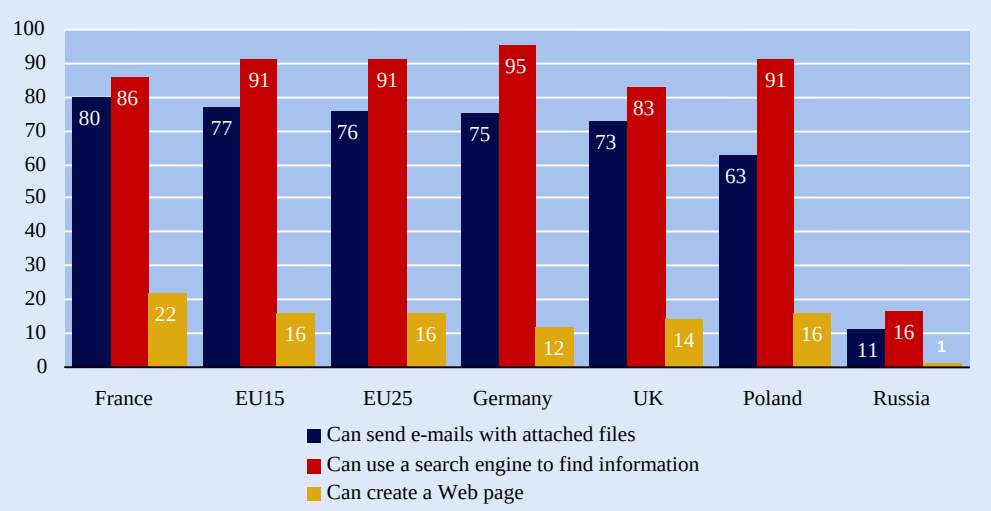


Sources: Eurostat and HSE.

Even if the Russian population has relatively good computer skills, the gap between Russians and European Union citizens is widening dramatically in terms of Internet skills. For example, only 11 per cent of the Russian population is capable of sending e-mails with attached files and only 16 per cent knows how to use a search engine to find information (see figure 30). In comparison, this is true for 45 per cent and 54 per cent of the population of the European Union. This indicates that Russians are not yet skilled or experienced enough to really take advantage of the benefits brought by ICTs, nor to become integrated in the global information society.

Figure 30. People aged 16-74 who have Internet skills, 2006

(Percentage)



Sources: Eurostat and HSE.

This first benchmarking of the Russian information society clearly shows two main results. On the one hand, that the information society in the Russian Federation is not as developed as it is in major economies such as those of the European Union and the United States. On the other hand, that the infant Russian information society can expect to undergo a period of rapid growth with regard to the frequency with which its citizens and enterprises use ICTs and the complexity of the skills they will acquire. In order to monitor and support this development, the international standards used in this project for assessing the state of the information society need to be introduced and implemented as an integral part of the official production of statistics in the Russian Federation.

Annex

Table III.1. ICT sector by types of economic activity

RCEA title	*RCEA code*	*NACE code Rev. 1.1*	*ISIC code Rev. 3.1*
Manufacture of office equipment and computers	30	3000	3000
Manufacture of insulated wires and cables	31.3	3130	3130
Manufacture of electronic valves and tubes and other electronic components	32.1	3210	3210
Manufacture of television and radio transmitters, apparatus for line telephony and line telegraphy	32.2	3220	3220
Manufacture of television and radio receivers, sound or video recording or reproducing apparatus	32.3	3230	3230
Manufacture of checking and measuring instruments and appliances	33.2	3320	3312
Assembly of devices for the control and regulation of technological processes	33.3	3330	3313
Wholesale trade of radio and television apparatus, information media (with and without records)	51.43.2		
Wholesale trade of office machinery	51.64.1	5143	
Wholesale trade of computers and peripheral equipments	51.64.2	5184	5151
Wholesale trade of operational materials and accessories for machinery and equipment	51.65.2	5186 5187	5152
Wholesale trade of industrial electric and electronic equipment, including telecommunications equipment	51.65.5		
Telecommunications	64.2	6420	6420
Renting of office machinery and equipment, including computer techniques	71.33	7133	7123
Computer related activities	72	72	72

Table III.2. ICT goods classification

Broad category	*CCFEC*
Telecommunications equipment	
Line telephone sets with cordless handsets	8517 11
Other telephone sets, video telephones	8517 19
Facsimile machines	8517 21
Teleprinters	8517 22
Telephonic or telegraphic switching apparatus	8517 30
Other apparatus, for carrier-current line systems or for digital line systems	8517 50
Other electrical apparatus for line telephony or line telegraphy	8517 80
Parts for other electrical apparatus for line telephony or line telegraphy	8517 90
Telephone answering machines	8520 20
Transmission apparatus for radio-telephony, radio-telegraphy, radio-broadcasting or television not incorporating reception apparatus	8525 10
Transmission apparatus for radio-telephony, radio-telegraphy, radio-broadcasting or television incorporating reception apparatus	8525 20
Television cameras	8525 30
Radar apparatus	8526 10
Reception apparatus for radio-telephony, radio-telegraphy or radio-broadcasting, whether combined or not, in the same housing, with sound recording or reproducing apparatus or a clock, n.e.s	8527 90
Aerials and aerial reflectors of all kinds; parts suitable for use therewith	8529 10
Burglar or fire alarms and similar apparatus	853110
Coaxial cable and other coaxial electric conductors	8544 20
Optical fibre cables	8544 70
Computer and related equipment	
Analogue or hybrid automatic data processing machines	8471 10
Portable digital automatic data processing machines, weighing not more than 10 kg, consisting of at least a central processing unit, a keyboard and a display	8471 30
Digital automatic data processing machines comprising in the same housing at least a central processing unit and an input and output unit, whether combined or not	8471 41
Other digital automatic data processing machines, presented in the form of systems	8471 49
Digital processing units other than those under subheadings 8471.41 and 8471.49, whether or not containing, in the same housing, one or two of the following types of unit: storage units, input units, output units	8471 50

Broad category	*CCFEC*
Automatic data processing machines, input or output units, whether or not containing storage units in the same housing	8471 60
Automatic data processing machines, storage units	8471 70
Other units of automatic data processing machines	8471 80
Magnetic or optical readers, machines for transcribing data onto data media in coded form and machines for processing such data, not elsewhere specified or included	8471 90
Parts and accessories of the machines under heading 84.71	8473 30
Electronic components	
Electrical transformers having a power handling capacity not exceeding 1 kVA	8504 31
Inductors	8504 50
Parts of: electrical transformers, static converters (for example, rectifiers) and inductors	8504 90
Cards incorporating a magnetic stripe, unrecorded	8523 30
Cards incorporating a magnetic stripe, recorded	8524 60
Parts suitable for use solely or principally with the apparatus of headings Nos. 85.25 to 85.28 except aerials and aerials reflectors	852990
Capacitors, fixed, tantalum having a reactive power handling capacity of less than 0.5 kvar	853221
Capacitors, fixed, ceramic dielectric, multilayer having a reactive power handling capacity of less than 0.5 kvar	8532 24
Variable or adjustable (pre-set) capacitors	8532 30
Fixed carbon resistors, composition or film types	8533 10
Electrical resistors, fixed, (including rheostats and potentiometers), other than heating resistors, for a power handling capacity <= 20 W	8533 21
Electrical resistors, fixed, (including rheostats and potentiometers), other than heating resistors, n.e.s.	8533 29
Wirewound variable resistors, for a power handling capacity <= 20 W	8533 31
Resistors, wirewound, variable, n.e.s.	8533 39
Other variable resistors, including rheostats and potentiometers	8533 40
Parts for electrical resistors (including rheostats and potentiometers), other than heating resistors	8533 90
Printed circuits	8534 00
Cathode-ray television picture tubes, including video monitor tubes, colour	8540 11
Cathode-ray television picture tubes, including video monitor tubes, black and white or other monochrome	8540 12

Broad category	*CCFEC*
Television camera tubes; image converters and intensifiers; other photo-cathode tubes	8540 20
Data/graphic display tubes, colour, with a phosphor dot screen pitch smaller than 0.4 mm	8540 40
Data/graphic display tubes, black and white or other monochrome	8540 50
Other cathode-ray tubes	8540 60
Microwave tubes, magnetrons, excluding grid-controlled tubes	8540 71
Microwave tubes, klystrons, excluding grid-controlled tubes	8540 72
Microwave tubes, other, excluding grid-controlled tubes	8540 79
Receiver or amplifier valves and tubes	8540 81
Valve and tubes, n.e.s.	8540 89
Parts of cathode-ray tubes	8540 91
Parts of thermionic or photo-cathode, valve and tubes, other than cathode-ray tubes	8540 99
Diodes, other than photosensitive or light emitting diodes	8541 10
Transistors, other than photosensitive, dissipation rate < 1 W	8541 21
Transistors, other than photosensitive transistors, n.e.s.	8541 29
Thyristors, diacs and triacs, other than photosensitive devices	8541 30
Photosensitive semiconductor devices, including photovoltaic cells whether or not assembled in modules or made up into panels; light emitting diodes	8541 40
Other semiconductor devices	8541 50
Mounted piezo-electric crystals	8541 60
Parts for semiconductor devices	8541 90
Cards incorporating electronic integrated circuits (“smart” cards)	8542 10
Digital monolithic integrated circuits	8542 21
Other monolithic integrated circuits	8542 29
Hybrid integrated circuits	8542 60
Electronic microassemblies	8542 70
Parts for electronic integrated circuits and microassemblies	8542 90
Audio and video equipment	
Microphones and stands	8518 10
Single loudspeakers, mounted in their enclosures	8518 21
Multiple loudspeakers, mounted in the same enclosure	8518 22

Broad category	*CCFEC*
Other loudspeakers, n.e.s	8518 29
Headphones and earphones, whether or not combined with a microphone, and sets consisting of a microphone and one or more loudspeakers	8518 30
Audio-frequency electric amplifiers	8518 40
Electric sound amplifier sets	8518 50
Parts of microphones, loudspeakers, headphones, earphones, combined microphone/loudspeaker sets, audio-frequency electric amplifiers and electric sound amplifier sets	8518 90
Coin or disc-operated record players	8519 10
Record players, without loudspeaker	8519 21
Record players, n.e.s.	8519 29
Turntables with automatic record changing mechanism	8519 31
Turntables, n.e.s.	8519 39
Transcribing machines	8519 40
Pocket size cassette players	8519 92
Other sound reproducing apparatus, cassette type	8519 93
Sound reproducing apparatus, not incorporating a sound recording device, n.e.s.	8519 99
Dictating machines not capable of operating without an external source of power	8520 10
Other magnetic tape recorders incorporating sound reproducing apparatus, digital audio type	8520 32
Other magnetic tape recorders incorporating sound reproducing apparatus, cassette type	8520 33
Other magnetic tape recorders incorporating sound reproducing apparatus	8520 39
Magnetic tape recorders and other sound recording apparatus, whether or not incorporating a sound reproducing device, n.e.s.	8520 90
Video recording or reproducing apparatus, whether or not incorporating a video tuner, magnetic tape-type	8521 10
Video recording or reproducing apparatus, whether or not incorporating a video tuner, other type	8521 90
Parts and accessories suitable for use solely or principally with the apparatus of headings Nos. 85.19 to85.21 - pick-up cartridges	8522 10
Parts and accessories suitable for use solely or principally with the apparatus under headings 85.19 to 85.21, other	8522 90
Magnetic tapes, unrecorded, width <= 4 mm (1/6 in.)	8523 11
Magnetic tapes, unrecorded, width > 4 mm (1/6 in.) but <= 6.5 mm (1/4 in.)	8523 12
Magnetic tapes, unrecorded, width > 6.5 mm (1/4 in.)	8523 13

Broad category	*CCFEC*
Magnetic discs, unrecorded	8523 20
Other prepared unrecorded media for sound recording or similar recording of other phenomena, other than products mentioned in chapter 37	8523 90
Still image video cameras and other video camera recorders, digital cameras	8525 40
Pocket size radio cassette players capable of operating without an external source of power	8527 12
Radio-broadcast receivers, capable of operating without an external source of power, combined with sound recording or reproducing apparatus	8527 13
Other radio-broadcast receivers, capable of operating without an external source of power, not combined with sound recording or reproducing apparatus	8527 19
Radio-broadcast receivers with sound recording or reproducing apparatus, for motor vehicles, requiring external source of power	8527 21
Other radio-broadcast receivers for motor vehicles, not combined with sound recording or reproducing apparatus	8527 29
Other radio-broadcast receivers, including apparatus capable of receiving also radio-telephony or radio-telegraphy, combined with sound recording or reproducing apparatus	8527 31
Other radio-broadcast receivers, including apparatus capable of receiving also radio-telephony or radio-telegraphy, not combined with sound recording or reproducing apparatus but combined with a clock	8527 32
Other radio-broadcast receivers, including apparatus capable of receiving radio-telephony or radio-telegraphy, n.e.s.	8527 39
Reception apparatus for television, whether or not incorporating radio-broadcast receivers or sound or video recording or reproducing apparatus, colour	8528 12
Reception apparatus for television, whether or not incorporating radio-broadcast receivers or sound or video recording or reproducing apparatus, black and white or other monochrome	8528 13
Video monitors, colour	8528 21
Video monitors, black and white or other monochrome	8528 22
Video projectors	8528 30
Other ICT goods	
Word processing machines	8469 11
Electronic calculators capable of operation without an external source of electric power and pocket size data recording, reproducing and displaying machines with calculating functions	8470 10
Other electronic calculating machines incorporating a printing device	8470 21
Other electronic calculating machines	8470 29
Accounting machines	8470 40
Cash registers	8470 50

Broad category	*CCFEC*
Parts and accessories (other than covers, carrying cases and the like) suitable for use solely or principally with machines under heading 84.69	8473 10
Parts and accessories of the electronic calculating machines under subheadings 8470.10, 8470.21 or 8470.29	8473 21
Parts and accessories equally suitable for use with machines under two or more of the headings 84.69 to 84.72	8473 50
Radio navigational aid apparatus	8526 91
Radio remote control apparatus	8526 92
Apparatus for the projection or drawing of circuit patterns on sensitized semiconductor materials, direct write-on-wafer apparatus	9010 41
Apparatus for the projection or drawing of circuit patterns on sensitized semiconductor materials, step and repeat aligners	9010 42
Apparatus for the projection or drawing of circuit patterns on sensitized semiconductor materials, other	9010 49
Direction finding compasses	9014 10
Instruments and appliances for aeronautical or space navigation (other than compasses)	9014 20
Other navigational instruments and appliances	9014 80
Parts and accessories of direction finding compasses, other navigational instruments and appliances	9014 90
Photogrammetrical surveying instruments and appliances	9015 40
Other surveying instruments and appliances	9015 80
Electro-cardiographs	9018 11
Ultrasonic scanning apparatus	9018 12
Magnetic resonance imaging apparatus	9018 13
Scintigraphic apparatus	9018 14
Other electro-diagnostic apparatus (including apparatus for functional exploratory examination or for checking physiological parameters)	9018 19
Computed tomography apparatus	9022 12
Other apparatus based on the use of X-rays, for dental uses	9022 13
Other apparatus based on the use of X-rays, for medical, surgical or veterinary uses	9022 14
Other apparatus based on the use of X-rays, for other uses	9022 19
Machines and appliances for testing the hardness, strength, compressibility, elasticity or other mechanical properties of materials, metals	9024 10
Other machines and appliances for testing the hardness, strength, compressibility, elasticity or other mechanical properties of materials	9024 80

Broad category	*CCFEC*
Parts and accessories for machines and appliances for testing the hardness, strength, compressibility, elasticity or other mechanical properties of materials	9024 90
Instruments and apparatus for measuring or checking the pressure of liquids or gases, excluding instruments and apparatus under headings 9014, 9015, 9028 or 9032	9026 20
Instruments and apparatus for physical or chemical analysis, gas or smoke analysis	9027 10
Spectrometers, spectrophotometers and spectrographs using optical radiations (ultraviolet, visible, infrared)	9027 30
Instruments and apparatus for measuring or checking quantities of heat, sound or light, exposure meters	9027 40
Other instruments and apparatus using optical radiations (ultraviolet, visible, infrared)	9027 50
Other instruments and apparatus for physical or chemical analysis	9027 80
Gas meters	9028 10
Liquid meters	9028 20
Electricity meters	9028 30
Parts for gas, liquid or electricity supply or production meters, including calibrating meters	9028 90
Revolution counters, production counters, taximeters, milometer, pedometers and the like	9029 10
Speed indicators and tachometers; stroboscopes	9029 20
Parts and accessories for revolution counters, production counters, taximeters, milometer, pedometers and the like; speed indicators and tachometers, other than those under headings 90.14 to 90.15; stroboscopes	9029 90
Instruments and apparatus for measuring or detecting ionising radiations	9030 10
Cathode-ray oscilloscopes and cathode-ray oscillographs	9030 20
Multimeters without a recording device	9030 31
Other instruments and apparatus for measuring or checking voltage, current, etc. without a recording device	9030 39
Other instruments and apparatus, specially designed for telecommunications (for example, cross-talk meters, gain measuring instruments, distortion factor meters, psophometers)	9030 40
Other instruments for measuring or checking semiconductor wafers or devices	9030 82
Other instruments for measuring or checking semiconductor wafers or devices with a recording device	9030 83
Measuring or checking instruments, appliances and machines n.e.s, machines for balancing mechanical parts	9031 10
Measuring or checking instruments, appliances and machines n.e.s, test benches	9031 20

Broad category	*CCFEC*
Measuring or checking instruments, appliances and machines n.e.s, profile projectors	9031 30
Other optical instruments and appliances, for inspecting semiconductor wafers or devices, or for inspecting photomasks or reticles used in manufacturing semiconductor devices	9031 41
Other measuring or checking instruments, appliances and machines, n.e.s.	9031 80
Parts and accessories for measuring or checking instruments, appliances and machines, n.e.s.	9031 90
Thermostats	9032 10
Manostats	9032 20
Other automatic regulating or controlling instruments and apparatus, n.e.s.	9032 89
Parts and accessories for automatically regulating or controlling instruments and apparatus	9032 90

Table III.3. ICT products listed in the Russian Classification of Products

Title	*RCP code*
Networks, systems, computer systems and complexes	401000
Electronic digital computing machine	401300
Central devices of computer networks, systems, complexes and electronic digital machines	402000
Peripheral devices of computing complexes and electronic digital machines	403000
Devices of inter-system coordination of networks, systems, complexes and electronic computing machines	404000
Devices of computing complexes and analogue and analogue-digital machines	405000
Program management devices	406000
Service devices and auxiliary computers, information medium	408000
Devices for the control and regulation of technological processes	421000
Electronic measuring devices	422000
Tele-mechanics facilities	423000
Program-technical complexes for automated systems	425000
Appliances for managerial and engineering activity mechanization and automation	426000
Nuclear and radioisotope devices	436000
Automation devices for special purposes	437000
Telephone and telegraph auxiliary equipment	529500
Communication line auxiliary equipment	529600
Appliances for post and communication line mechanization and automation	529700
Electronic devices except resistors and capacitors	630000
Radio and television broadcasting devices for general use	657000
Radio electronic domestic apparatus	658000
Wire communication facilities, terminal and transitional radio apparatus	660000
Navigation devices	680000

Table III.4. ICT professions listed in the Russian Classification of Occupations

Profession	*RCO code*
Professions that require a degree	
Designers and analysts of computer systems	2131
Programmers	2132
Other computer related professionals	2139
Electronics, communication and instrument engineers	2144
Technical professions	
Electronics and telecommunications technicians	3114
Computer maintenance technicians and operators	3121
Computer devices and peripherals maintenance technicians and operators	3122
Industrial robots maintenance technicians and operators	3123
Radio, television and telecommunications hardware technicians and operators	3132

Table III.5. Methods for calculating the gross added value created by ICT enterprises

Indicator	*Calculation method*
Added value	Difference between enterprises' output and costs (interim consumption).
Output	For large and medium enterprises, the total sales of goods (services) produced and goods purchased for subsequent sale (minus the cost of acquiring such goods); manufactured products included in capital assets during the financial year; construction and installation works for own consumption at own cost; Government budget subsidies to cover losses from the sale of goods (services), raw materials, other materials, components, fuel acquired previously to manufacture products (minus costs of acquiring such goods), adjusted for remaining goods which can be subsequently sold and finished products manufactured in-house; unfinished products. The output of small enterprises is calculated on the basis of data on revenues from the sales of goods and services, their cost and structural ratio of indicators used to calculate output of large and medium enterprises.
Interim consumption	Total cost of buying raw materials, other materials, half-finished products and components for the manufacture and sale of products and services; fuel, energy, water; cost of works and services commissioned from other enterprises; rent; representation expenses adjusted to take into account remaining fuel, raw materials, other materials, half-finished products and components for the manufacture and sale of products, minus the cost of acquiring raw materials, other materials, fuel, components purchased previously to manufacture products but subsequently sold without processing. For small enterprises, calculation is made according to the ratio of output and interim consumption for large and medium enterprises.

Table III.6. Number of surveyed enterprises and number of employees, by economic activity

	RCEA code of economic activity	*Number of surveyed enterprises*	*Number of employees on the payroll*	*Percentage of total*	
				Enterprises	*Employees*
ICT sectors		1 751	545 197	100.0	100.0
Manufacture of office equipment and computers	30	15	14 036	0.9	2.6
Manufacture of insulated wires and cables	31.3	46	26 458	2.6	4.9
Manufacture of radio, television and communication equipment and apparatus	32	33	15 698	1.8	2.9
Manufacture of checking and measuring instruments and appliances	33.2	21	8 943	1.2	1.6
Assembly of devices for the control and regulation of technological processes	33.3	9	1 277	0.5	0.2
Wholesale trade of radio and television apparatus, information media (with and without records)	51.43.2	8	509	0.5	0.1
Wholesale trade of office machinery	51.64.1	8	1 051	0.5	0.2
Wholesale trade of computers and peripheral equipments	51.64.2	30	5 169	1.7	0.9
Wholesale trade of operational materials and accessories for machinery and equipment	51.65.2	38	1 449	2.2	0.3
Wholesale trade of industrial electric and electronic equipment, including telecommunications equipment	51.65.5	34	2 191	1.9	0.4
Telecommunications	64.2	958	427 330	54.7	78.4
Renting of office machinery and equipment, including computer techniques	71.33	10	205	0.6	0.0
Computer related activities	72	541	40 881	30.9	7.5

Table III.7. In-house manufactured products shipped and services provided, by economic activity

(Thousands of rubles)

	RCEA code of economic activity	*In-house manufactured products shipped and services provided (minus VAT, excises and other similar duties)*	*Of which are ICT related goods and services*	*Of which are:*	
				ICT related goods	*ICT related services*
ICT sectors		424 050 579	270 268 649	26 815 253	243 453 396
Manufacture of office equipment and computers	30	4 108 772	3 035 453	2 885 654	149 799
Manufacture of insulated wires and cables	31.3	26 728 372	5 063 548	5 053 635	9 913
Manufacture of radio, television and communication equipment and apparatus	32	14 176 807	13 190 009	13 153 961	36 048
Manufacture of checking and measuring instruments and appliances	33.2	2 919 911	1 587 175	1 091 617	495 558
Assembly of devices for the control and regulation of technological processes	33.3	347 780	56 741	56 741	-
Wholesale trade of radio and television apparatus, information media (with and without records)	51.43.2	167 523	3 247	653	2 594
Wholesale trade of office machinery	51.64.1	881 846	18 475	-	18 475
Wholesale trade of computers and peripheral equipments	51.64.2	4 669 466	371 231	111 333	259 898
Wholesale trade of operational materials and accessories for machinery and equipment	51.65.2	478 827	-	-	-
Wholesale trade of industrial electric and electronic equipment, including telecommunications equipment	51.65.5	869 167	601	-	601
Telecommunications	64.2	344 259 028	226 459 523	259 996	226 199 527

	RCEA code of economic activity	*In-house manufactured products shipped and services provided (minus VAT, excises and other similar duties)*	*Of which are ICT related goods and services*	*Of which are:*	
				ICT related goods	*ICT related services*
Renting of office machinery and equipment, including computer techniques	71.33	769 930	25 591	-	25 591
Computer related activities	72	23 673 150	20 457 054	4 201 663	16 255 392

Table III.8. Sale of ICT related goods manufactured by other companies, by economic activity

(Thousands of rubles)

	RCEA code of economic activity	*Sale of ICT related goods manufactured by other companies*	*Of which*	
			Hardware	*Software*
ICT sectors		18 867 143	18 627 618	239 525
Manufacture of office equipment and computers	30	16 299	6 978	9 321
Manufacture of insulated wires and cables	31.3	-	-	-
Manufacture of radio, television and communication equipment and apparatus	32	23 935	23 935	-
Manufacture of checking and measuring instruments and appliances	33.2	-	-	-
Assembly of devices for the control and regulation of technological processes	33.3	-	-	-
Wholesale trade of radio and television apparatus, information media (with and without records)	51.43.2	94 287	94 287	-
Wholesale trade of office machinery	51.64.1	449 616	444 551	5 065
Wholesale trade of computers and peripheral equipments	51.64.2	3 020 330	2 967 830	52 500
Wholesale trade of operational materials and accessories for machinery and equipment	51.65.2	-	-	-
Wholesale trade of industrial electric and electronic equipment, including telecommunications equipment	51.65.5	37 836	37 836	
Telecommunications	64.2	692 470	675 368	17 101
Renting of office machinery and equipment, including computer techniques	71.33	-	-	-
Computer related activities	72	14 532 369	14 376 831	155 538

Table III.9. ICT related services

ICT related services	*ICT related services*	
	Thousands of rubles	*Percentage of total*
Consulting in the purchase, mounting and maintenance of computer hardware	406	0.2
Consulting in computer software	1 637	0.7
Consulting in information services and data processing, data preparation and input	3 119	1.3
Services in development of automated information systems, systems for scientific research, CAD/CAM and databases	1 986	0.8
Repair and maintenance of computer hardware, peripherals and office equipment	1 944	0.8
Services in software development	141	0.1
Services in electronic information and inquiries	1 439	0.6
Telematics and data transmission	69 520	28.6
Services in ICT training	81	0.0
Other ICT related services	163 180	67.0
Total	**243 453**	**100.0**

Table III.10. Current cost of production and sale of goods (works, services) and investments, by economic activity

(Thousands of rubles)

	RCEA code of economic activity	*Costs of production and sale of goods (works, services)*	*Of which, personnel costs*	*Investments in capital assets*	*Investments in intangible assets*	*R&D costs*
ICT sectors		284 962 642	58 111 171	91 153 358	253 402	1 004 749
Manufacture of office equipment and computers	30	3 387 273	887 438	122 311	68	15 875
Manufacture of insulated wires and cables	31.3	5 109 530	373 854	83 822	140	67
Manufacture of radio, television and communication equipment and apparatus	32	13 449 564	817 611	169 226	117	706
Manufacture of checking and measuring instruments and appliances	33.2	2 164 382	791 006	36 347	28	-
Assembly of devices for the control and regulation of technological processes	33.3	50 138	29 022	192	-	-
Wholesale trade of radio and television apparatus, information media (with and without records)	51.43.2	117 725	9 842	1 381	-	-
Wholesale trade of office machinery	51.64.1	432 310	7 406	1 009	17	-
Wholesale trade of computers and peripheral equipments	51.64.2	3 495 120	111 413	6 049	-	-

	RCEA code of economic activity	*Costs of production and sale of goods (works, services)*	*Of which, personnel costs*	*Investments in capital assets*	*Investments in intangible assets*	*R&D costs*
Wholesale trade of operational materials and accessories for machinery and equipment	51.65.2	17 422	1 352	-	-	-
Wholesale trade of industrial electric and electronic equipment, including telecommunications equipment	51.65.5	4 102	2 096	-	-	-
Telecommunications	64.2	232 571 341	49 834 114	90 048 422	235 308	65 965
Renting of office machinery and equipment, including computer techniques	71.33	21 951	1 635	-	-	-
Computer related activities	72	24 141 784	5 244 382	684 599	17 724	922 136

Table III.11. Enterprises that use different types of ICT

(Percentage)

Types of ICT	*Percentage of all enterprises*
Personal computers	97.3
Computers of other types	29.3
Local area networks	82.1
E-mail	86.5
Internet	86.6
Other global networks	20.0
Dedicated communication lines	57.9
Websites	45.2

Table III.12. Personal computers at enterprises, by economic activity

(Units per 100 employees)

	RCEA code of economic activity	*Total*	*Of which, with Internet access*
ICT sectors		42	19
Manufacture of office equipment and computers	30	19	8
Manufacture of insulated wires and cables	31.3	16	5
Manufacture of radio, television and communication equipment and apparatus	32	42	11
Manufacture of checking and measuring instruments and appliances	33.2	14	3
Assembly of devices for the control and regulation of technological processes	33.3	8	1
Wholesale trade of radio and television apparatus, information media (with and without records)	51.43.2	25	13
Wholesale trade of office machinery	51.64.1	60	16
Wholesale trade of computers and peripheral equipments	51.64.2	48	41
Wholesale trade of operational materials and accessories for machinery and equipment	51.65.2	28	13
Wholesale trade of industrial electric and electronic equipment, including telecommunications equipment	51.65.5	39	20
Telecommunications	64.2	40	18
Renting of office machinery and equipment, including computer techniques	71.33	20	13
Computer related activities	72	105	48

Table IV.1. Structure of Eurostat questionnaire on ICT and e-commerce usage at enterprises, 2007

Section	*Content*
General information	Use of ICTs at enterprises; employees who use ICTs; use of special software including specialized applications; use of data protection tools for data transferred over global networks.
Internet use	Internet access; types of Internet access; purposes of using the Internet; presence of website and information published there.
E-commerce over the Internet	Participation in e-commerce; share of sales/purchases made over the Internet.
E-commerce over other global networks	Participation in e-commerce; share of sales/purchases made over other global networks.
E-skills and demand for them	Hiring ICT professionals and users; demand for them; problems with filling relevant vacancies; training; use of outside ICT consulting services.
Background information	Economic activity; number of employees; expenditures on goods and services; turnover; location.

Table IV.2. ICT and e-commerce usage at enterprises: main definitions

Name	*Definition*
Personal computers	All kinds of personal computers: PC/XT, AT, Pentium and compatible, Macintosh, notebooks, portable personal computers and other. All computers are taken into account regardless of whether they are owned by the organization, leased, rented, donated or otherwise acquired for work related purposes.
Local area network	Unlike global information networks, a local area network connects two or more computers (possibly of different kinds) located within the same building or in several neighbouring buildings, without using general communication networks. Connecting a computer to industrial equipment or peripheral device does not create a local or global computer network.
E-mail	Exchange of electronic text messages over communication channels.
Global information network	A set of computers located anywhere in the world, connected with each other over long distance communication channels (dial-up or dedicated) provided by telephone or other communications companies. Global information networks allow users to exchange data, share hardware and software and information resources. Global networks can be public (the Internet, e-mail) or specialized (corporate or departmental).
Intranet	A distributed corporate computer network designed to provide employees with access to electronic corporate information resources.
Extranet	An extension of the Intranet with designated segments that can be accessed by outside users, for example by allowing outside customers partial access to corporate data on the processing of their orders or the availability of goods at warehouses.
Shipped in-house manufactured products, works and services provided by the organization	Total amount of shipped, sold or exchanged (bartered) products manufactured by the organization, services provided or works carried out directly by the organization in actual sale prices (not counting VAT, excises and other similar compulsory duties).
Sold ICT related goods manufactured by other enterprises (not counting VAT, excises and other similar duties)	Value of sold goods previously acquired from other parties for subsequent sale (such purchases must be accounted in debit of account 41) (goods, materials, products acquired explicitly for subsequent sale or manufactured goods acquired for subsequent use as components, whose value was not included in the production cost of sold products but must be compensated by buyers separately). Sold surplus raw and other materials also should be counted. Data should be calculated in actual sale prices not counting VAT, excises and other similar compulsory duties. Sold capital assets, intangible assets, currency and securities owned by the organization should not be counted.
Internet connection type	
Dial-up modem connection	Modem is a device which transforms digital data in analogue signals by MODulating them at the source and DEModulating at the receiving end. Modems allow users to exchange data between remote computers via existing telephone lines.
ISDN channel	An Integrated Services Digital Network allows users to transfer voice, data and images simultaneously. It allows users to access the Internet via public telephone networks using special ISDN equipment.

Name	*Definition*
Digital subscriber line (xDSL etc.)	Digital subscriber line technology allows high-speed broadband connection via common copper cables used for telephone communication.
Wireless communications	Include satellite, radio, mobile telephone, etc. communications.
Specialized software applications	
To manage the sale and procurement of goods and services	Specialized software for managing the sale and purchase of goods and services used to perform at least one of the following operations: registering orders, updating them, preparing payment documents for sales or purchases, managing the production of goods and services.
CRM systems	Customer Relationship Management systems allow enterprises to collect and accumulate various data about their clients (for example, on the supply of and demand for goods and services, sale cycles, prices).
ERP systems	Enterprise Resource Planning systems allow users to identify and plan how to use all the organization's resources needed for sales, production, procurement and accounting, to fill clients' orders.
SCM systems	Supply Chain Management systems provide automatic links to orders management systems used to process orders placed by customers and suppliers.
Data protection tools for transferring global networks data	
Encryption tools	Hardware, software, and mixed hardware and software tools, systems and complexes which use cryptographic algorithms to transform data. These tools guarantee that the protected data cannot be read without a secret key.
Digital signature	Hardware, software, and mixed hardware and software tools which perform at least one of the following functions through the cryptographic transformation of data: creation of a digital electronic signature using a secret electronic digital signature key; verification of the validity of a digital electronic signature by using an open electronic digital signature key; creation of secret and open electronic digital signature keys.
ICT professionals	Employees who have skills with the following OKZ codes: 2131, 2132, 2139, 2144, 3114, 3121, 3122, 3123, 3132.
Employees with ICT user skills	Users of computers, other office equipment and global networks who have basic software user skills but who are not ICT professionals.

Table IV.3. Local classifications

Size of the enterprise
(a) 0-49 employees; (b) 50-99 employees; (c) 100-199 employees; (d) 200-499 employees; (e) 500-999 employees; (f) 1000-4999 employees; (g) 5000-9999 employees.
Special software applications
(a) For research and development; (b) For design; (c) For the management, monitoring and control of automated production and/or individual technical devices or technological processes; (d) For dealing with organizational, management and economic tasks; (e) For managing the sale and procurement of goods and services; (f) For electronic financial transactions; (g) For providing access to the enterprise's databases via global information networks, including the Internet; (h) Electronic legal information systems; (i) Customer Relationship Management systems; (j) Enterprise Resource Planning systems; (k) Supply Chain Management systems; (l) Editorial and publishing systems; (m) Antivirus software; (n) Training programmes; (o) Other.
Types of ICT
(a) Personal computers; (b) Other computers; (c) Local area networks; (d) E-mail; (e) Global information networks: Internet, Intranet, Extranet, other global information networks.

Top Internet connection speed

(a) 128 Kbs or below;

(b) 129-256 Kbs;

(c) 257-512 Kbs;

(d) 513 Kbs-1 Mbs;

(e) 1001-2 Mbs;

(f) Over 2 Mbs.

Enterprises by ICT users' share of total number of employees

(a) Less than 10 per cent;

(b) 10-29 per cent;

(c) 30-49 per cent;

(d) 50-69 per cent;

(e) 70-100 per cent;

(f) None.

Types of ICT expenditures

(a) Procurement of computers (including installation and initialization);

(b) Procurement of software;

(c) Telecommunications costs;

  (i) Internet access costs;

(d) Costs of ICT related staff training;

(e) Costs of ICT related services provided by outside organizations and professionals (except telecommunications and training);

(f) Other ICT related costs.

Reasons for using the Internet

(a) General purposes:

  (i) Searching for information;

  (ii) Using e-mail;

  (iii) Exchanging electronic information;

  (iv) Training;

  (v) Hiring;

  (vi) Telephone communications, video conferencing.

(b) Using the Internet to communicate with suppliers:

  (i) Obtaining information about desired goods and services, and their suppliers;

  (ii) Providing information about the organization's needs for goods and services;

  (iii) Placing orders for goods and services;

(iv) Paying for supplied goods and services;

(v) Obtaining electronic products.

(c) Using the Internet to communicate with customers:

(i) Providing information about goods and services supplied by the organization;

(ii) Receiving orders for goods and services supplied by the organization;

(iii) Conducting electronic payment transactions with customers;

(iv) Distributing electronic products;

(v) After-sales service.

(d) Using the Internet to interact with Government agencies:

(i) Obtaining information about public administration agencies;

(ii) Obtaining blank forms (e.g. statistical or tax return forms);

(iii) Returning filled forms (e.g. statistical or tax return forms);

(iv) Taking part in electronic tenders to supply goods and services to Government or municipal agencies.

Results of using the Internet

(a) Reduced costs of production and sale of goods and services;

(b) Improved quality of goods and services;

(c) Wider range of supplied goods and services;

(d) Finding new suppliers;

(e) Creation of new markets in the Russian Federation and/or in other countries; finding new customers;

(f) Preserving traditional markets for goods and services;

(g) Improved relationship with suppliers and customers;

(h) Accelerated production and sale of goods and services;

(i) Reduced personnel;

(j) Better working conditions;

(k) Improved nature of work, by making it more attractive and rewarding;

(l) Improved image of the enterprise.

Barriers to the use of computers

(a) Technological barriers:

(i) Excessive technical problems;

(ii) Mismatch between available hardware and software, and the specific needs of the organization;

(iii) Insufficient protection of data against unauthorized access or computer viruses;

(iv) Lack of technical opportunity to connect to telecommunications networks;

(v) Inadequate quality of the connection;

(vi) Inadequate quality of the information obtained via the Internet.

(b) Economic barriers:

(i) Lack of funds;

(ii) Uncertain economic benefits of using ICT;

(iii) Insufficient use of ICT by partners, suppliers and customers;

(iv) Risk of fraud and other abuse connected with electronic financial transactions.

(c) Production barriers:

(i) Insufficient need to use ICT due to the nature of the enterprise's economic activity and the goods and services it produces;

(ii) Insufficient level of ICT knowledge and skills among employees;

(iii) Resistance to innovation by employees;

(iv) Lack of skilled ICT professionals;

(v) Waste of work time due to inappropriate use of ICT by employees (games, irrelevant use of the Internet etc.).

(d) Legal barrier:

(i) Insufficient legislation regulating the use of the Internet.

Percentage of all purchases and sales made over the Internet

(a) Less than 10 per cent ;

(b) 10-29 per cent;

(c) 30-49 per cent;

(d) 50-69 per cent;

(e) 70-100 per cent;

(f) None.

ICT related services

(a) Consulting services for the purchase, installation and use of computer hardware;

(b) Consulting services on computer software;

(c) Consulting services on dataware and data processing, data preparation and input services;

(d) Design of automated information systems, research and development systems, design and management systems based on the use of computer databases;

(e) Office equipment, computer hardware and peripherals maintenance and repair services;

(f) Design of systems and applied software;

(g) Electronic information and directory services;

(h) Telematic and data transfer services;

(i) ICT related training services;

(j) Other ICT related services.

Table IV.4. Enterprises using ICT

(Percentage of all enterprises)

Enterprises that use	*2001*	*2002*	*2003*	*2004*	*2005*
Personal computers	78.7	81.1	84.6	87.6	91.1
Other computers	..	6.8	8.3	8.4	9.3
Local area networks	39.0	41.6	45.8	49.7	52.4
Global information networks	34.2	39.5	44.9	50.4	54.3
Of which					
Internet	32.4	37.7	43.4	48.8	53.3
Other global networks	5.8	7.2	6.7	8.4	7.2
Dedicated communication channels	..	10.9	13.5	16.9	19.0
Enterprises with websites	10.2	11.6	13.5	14.4	14.8

Table IV.5. Number of personal computers at enterprises

(Thousands of units and as a percentage)

	2001	*2002*	*2003*	*2004*	*2005*
Thousands of units					
Total	3 040.5	3 511.9	4 150.5	4 558.3	5 709.6
Are connected to local area networks	1 882.0	2 232.5	2 794.2	3 177.9	4 057.6
Have access to global networks	767.2	941.1	1 204.0	1 513.4	2 032.0
Have access to the Internet	585.8	759.2	986.0	1 218.8	1 686.1
Were acquired during the financial year	487.0	530.7	656.2	743.8	978.6
Percentage of all personal computers					
Are connected to local area networks	61.9	63.6	67.3	69.7	71.1
Have access to global networks	25.2	26.8	29.0	33.2	35.6
Of which, have access to the Internet	19.3	21.6	23.8	26.7	29.5
Were acquired during the financial year	16.0	15.1	15.8	16.3	17.1

Table IV.6. Employees who use personal computers

(Percentage of all enterprises)

	Percentage of enterprises with the following share of employees who use personal computers					
	100–70	*69–50*	*49–30*	*29–10*	*less than 10*	*None*
All personal computers						
2002	17.7	7.5	7.6	16.8	31.5	18.9
2003	20.1	8.3	8.3	18.3	29.7	15.4
2004	21.5	9.0	9.4	20.4	27.3	12.4
2005	22.8	9.3	9.9	21.5	27.5	8.9
Only personal computers with Internet access						
2002	2.2	1.8	2.5	6.1	25.1	62.3
2003	2.8	2.2	3.1	7.2	28.2	56.6
2004	3.3	2.5	3.6	8.8	30.6	51.2
2005	4.1	3.2	4.3	9.7	32.0	46.7

Table IV.7. Reasons for using global information networks

(Percentage of all enterprises)

	2001	*2002*	*2003*	*2004*	*2005*
General reasons					
Searching for information on the Internet	30.1	33.9	39.2	43.7	47.5
E-mailing	31.1	35.6	40.7	45.7	48.8
Exchanging electronic information	28.9	32.6	37.5	41.9	44.8
Training	7.8	8.3	10.1	11.5	12.6
Hiring	4.1	5.0	6.2	7.3	8.5
Using the Internet to communicate with suppliers					
Obtaining information on desired goods and services, and their suppliers	20.1	21.5	24.6	27.3	29.1
Providing information about the enterprise's needs for goods and services	..	11.3	13.7	15.5	17.5
Placing orders for goods and services	10.1	10.1	12.1	14.1	16.3
Paying for purchased goods and services	3.8	4.5	6.0	7.1	7.9
Obtaining electronic products	10.9	10.3	11.2	12.7	13.4
Using the Internet to communicate with customers					
Providing information about the goods and services offered by the enterprise	14.6	15.2	17.6	19.1	20.3
Receiving orders for goods and services supplied by the enterprise	8.0	9.0	10.5	11.8	12.6
Receiving electronic payments from customers	4.1	4.8	6.1	7.3	7.8
Distributing electronic products	2.8	2.3	2.5	2.6	2.8
After-sales service	2.4	2.0	2.2	2.3	2.4
Using the Internet to interact with government agencies					
Obtaining information about work of public administration agencies	..	..	..	18.9	22.7
Obtaining blank forms (e.g. statistical or tax returns)	..	..	..	24.4	29.3
Returning filled forms (e.g. statistical or tax returns)	..	..	..	18.0	22.4

Table IV.8. Main barriers to the use of computers[16]

(Percentage of all enterprises)

Technological barriers	*2002*	*2003*	*2004*	*2005*
Excessive technical problems	2.9	2.6	3.8	3.7
Mismatch between available hardware and software and the specific needs of the enterprise	4.1	4.0	4.8	4.8
Insufficient protection of data against unauthorized access or computer viruses	2.5	2.6	3.0	3.1
Economic barriers				
Lack of funds	39.7	39.8	39.7	37.0
Uncertain economic benefits of using ICT	3.5	3.3	3.7	3.6
Insufficient use of ICT by partners, suppliers and customers	2.7	2.4	2.5	2.4
Production barriers				
Insufficient need to use ICT due to the nature of the enterprise's economic activity and the goods and services it produces	5.9	5.5	6.1	6.2
Insufficient level of ICT knowledge and skills of employees	4.5	4.8	4.9	5.0
Resistance to innovation by employees	1.1	1.2	1.1	1.2
Lack of skilled ICT professionals	7.5	8.1	8.2	8.8
Waste of work time due to inappropriate use of ICT by employees (games, irrelevant use of the Internet, etc.)	0.6	0.8	0.8	1.0

[16] The survey includes the following rating of barriers hindering use of ICT: insignificant, significant, main, can't say. This and the following table include shares of enterprises which rated the barrier as "main".

Table IV.9. Barriers to the use of global information networks

(Percentage of all enterprises)

Technological barriers	*2002*	*2003*	*2004*	*2005*
Excessive technical problems	4.4	3.8	4.8	4.1
Mismatch between available hardware and software and the specific needs of the enterprise	4.2	3.9	4.5	4.0
Insufficient protection of data against unauthorized access or computer viruses	4.4	4.9	5.3	5.2
Lack of technical opportunity to connect to telecommunications networks	5.2	5.1	5.4	5.2
Inadequate quality of the connection	5.2	5.3	5.4	5.4
Inadequate quality of the information obtained via the Internet	1.3	1.2	1.4	1.4
Economic barriers				
Lack of funds	33.5	34.5	34.7	32.5
Uncertain economic benefits of using ICT	4.5	4.3	4.4	4.1
Insufficient use of ICT by partners, suppliers and customers	3.3	3.0	3.0	2.7
Risks of fraud and other abuse connected with electronic financial transactions	3.4	3.4	3.8	3.8
Production barriers				
Insufficient need to use ICT due to the nature of the enterprise's economic activity and the goods and services it produces	7.0	6.6	6.9	6.6
Insufficient level of ICT knowledge and skills of employees	5.0	5.7	5.5	5.4
Resistance to innovation by employees	1.1	1.2	1.2	1.2
Lack of skilled ICT professionals	7.1	7.8	7.8	8.0
Waste of work time due to inappropriate use of ICT by employees (games, irrelevant use of the Internet, etc.)	0.9	1.2	1.3	1.5
Legal barrier				
Insufficient legislation regulating the use of the Internet	2.8	2.6	2.6	2.5

Table IV.10. ICT related expenses

(Percentage and millions of rubles)

	2002		*2003*		*2004*		*2005*	
	ICT related costs	*Per cent*	*ICT related costs*	*Per cent*	*ICT related costs*	*Per cent*	*ICT related costs*	*Per cent*
Total	160 212.8	100	164 572.3	100	168 373.3	100	215 301.6	100
Procurement of computers	78 659.4	49.1	71 527.9	43.5	76 460.9	45.4	78 508.5	36.5
Procurement of software	21 929.3	13.7	15 579.9	9.5	16 556.0	9.8	21 914.3	10.2
Communication costs	34 548.7	21.6	43 574.6	26.5	40 237.2	23.9	56 703.8	26.3
ICT related training of staff	1 133.2	0.7	1 487.6	0.9	1 351.0	0.8	2 200.0	1.0
Procurement of ICT related services from outside enterprises and professionals (except communication and training)	14 511.5	9.1	22 838.5	13.9	19 480.9	11.6	34 861.6	16.2
Other ICT related expenses	9 430.7	5.8	9 563.8	5.7	14 287.3	8.5	21 113.5	9.8

Table V.1. ICT related courses and specializations available at higher vocational institutes

Title	*RCPE code*
Physics and mathematics	
Mathematics, applied mathematics	010200
Mathematics, computer sciences	010300
Information technologies	010400
Applied mathematics and informatics	010500
Applied mathematics and informatics	010501
Information systems, mathematic support and administration	010503
Applied mathematics and physics	010600
Radiophysics	010800
Radiophysics and electronics	010801
Fundamental radiophysics and physical electronics	010802
Microelectronics and semiconductor devices	010803
Education and pedagogy	
Informatics	050202
Public health	
Medical cybernetics	060114
Economics and control	
Business informatics	080700
Applied informatics	080800
Applied informatics by field	080801
Information safety	
Information safety	090100
Cryptography	090101
Computer safety	090102
Organization and technology of information safety	090103
Complex protection of information objects of informatization	090104
Complex information safety of automated systems	090105
Information safety of telecommunication systems	090106
Countering technical intelligence	090107
Power engineering, power engineering machinery construction and electrical engineering	
Electronics and automation of physical equipment	140306

Title	*RCPE code*
Metallurgy, machinery construction and metal working	
Technology, equipment and automation of machinery construction	150900
Aeronautical engineering, missile and space technology	
Systems of aircraft control	160403
Transport facilities	
Railway automation, remote control and communication	190402
Electronic technology, radio technology and communication	
Electronics and microelectronics	210100
Physical electronics	210101
Quantum and optical electronics	210103
Microelectronics and solid electronics	210104
Electronic devices and instruments	210105
Industrial electronics	210106
Electronic machinery construction	210107
Micro-system equipment	210108
Design and technology of electronic devices	210200
Design and technology of radio electronic devices	210201
Design and technology of computing devices	210202
Radio engineering	210300
Radio physics and electronics	210301
Radio engineering	210302
Common radio electronic apparatus	210303
Radio electronic systems	210304
Facilities for radio electronic protection	210305
Audio-visual equipment	210312
Telecommunications	210400
Physics and optical communication facilities	210401
Facilities for mobile objects communication	210402
Protected communication systems	210403
Multi-channel telecommunication systems	210404
Radio communication, radio broadcasting and television	210405
Communication networks and communication systems	210406

Title	*RCPE code*
Automation and control	
Systems analysis and control	220100
Automation and control	220200
Control and informatics in technical systems	220201
Ship control systems	220202
Autonomous information and control systems	220203
Computer aided technologies and production	220300
Automation of technological processes and production (by branches)	220301
Mechanotronics and robotics	220400
Mechanotronics	220401
Robots and robot systems	220402
Informatics and computer engineering	
Informatics and computer engineering	230100
Computing machinery, complexes, systems and networks	230101
Computer aided systems of information processing and control	230102
Computer aided design systems	230104
Software of computer engineering and computer aided systems	230105
Information systems	230200
Information systems and technologies	230201
Information technologies in education	230202
Applied mathematics	230400
Applied mathematics	230401

Table V.2. ICT students at higher education institutes, by subject, 2005-2006 academic year

Subject	*OKSO code*	*Total*			*Percentage of all ICT students*		
		Admitted	*Studying*	*Graduated*	*Admitted*	*Studying*	*Graduated*
Total for the Russian Federation		1 640 480	7 064 577	1 151 645			
Of which are studying ICT related subjects		130 091	525 993	82 599	100	100	100
Of which study							
Physics and mathematics							
Mathematics, applied mathematics	010200	418	1 230	246	0.3	0.2	0.3
Mathematics, computer science	010300	266	783	84	0.2	0.1	0.1
Information technologies	010400	258	570	15	0.2	0.1	0.0
Applied mathematics and informatics	010500	1 647	6 517	1 458	1.3	1.2	1.8
Applied mathematics and informatics	010501	8 571	35 380	5 407	6.6	6.7	6.5
Mathematical support and administration of information systems	010503	1 813	6 603	350	1.4	1.3	0.4
Applied mathematics and physics	010600	885	5 069	1 420	0.7	1.0	1.7
Radio physics	010800	196	875	191	0.2	0.2	0.2
Radio physics and electronics	010801	920	4 347	740	0.7	0.8	0.9
Fundamental radio physics and physical electronics	010802	133	619	33	0.1	0.1	0.0
Microelectronics and semiconductor instruments	010803	190	815	110	0.1	0.2	0.1
Education and pedagogy							
Informatics	050202	4 428	17 956	2 053	3.4	3.4	2.5
Health care							
Medical cybernetics	060114	159	529	15	0.1	0.1	0.0
Economics and management							
Business-informatics	080700	307	673	-	0.2	0.1	-
Applied informatics	080800	89	311	63	0.1	0.1	0.1
Applied informatics by subject areas	080801	21 864	83 875	9 290	16.8	15.9	11.2
Information security							
Computer security	090102	911	3 741	249	0.7	0.7	0.3
Procedures and techniques of data protection	090103	1 303	4 756	368	1.0	0.9	0.4
Comprehensive protection of information objects	090104	1 141	3 725	298	0.9	0.7	0.4
Comprehensive information security of automated systems	090105	1 004	4 003	349	0.8	0.8	0.4
Information security of telecommunications systems	090106	472	1 669	132	0.4	0.3	0.2

Subject	OKSO code	Total			Percentage of all ICT students		
		Admitted	Studying	Graduated	Admitted	Studying	Graduated
Counter-measures against technical intelligence gathering	090107	25	95	6 285	0.02	0.02	7.6
Power engineering, power machine building and electrical engineering							
Electronics and automatics of physical installations	140306	454	2 377	278	0.3	0.5	0.3
Metallurgy, mechanical engineering and metal working							
Technology, equipment and automation of mechanical engineering	150900	1 665	6 579	1 691	1.3	1.3	2.0
Aeronautical and space engineering							
Aircraft control systems	160403	239	1 378	232	0.2	0.3	0.3
Transport							
Automation, telemechanics and communications at railway transport	190402	2 400	10 978	1 821	1.8	2.1	2.2
Electronic engineering, radio electronics and communications							
Electronics and microelectronics	210100	1 033	4 340	948	0.8	0.8	1.1
Physical electronics	210101	150	775	139	0.1	0.1	0.2
Quantum and optical electronics	210103	-	103	-	-	0.02	-
Microelectronics and solid-state electronics	210104	898	4 241	814	0.7	0.8	1.0
Electronic instruments and devices	210105	608	3 491	526	0.5	0.7	0.6
Industrial electronics	210106	2 096	9 044	1 352	1.6	1.7	1.6
Electronic engineering	210107	226	1 247	261	0.2	0.2	0.3
Microsystems technology	210108	106	343	12	0.1	0.1	0.0
Electronic devices design and technology	210200	388	1 671	435	0.3	0.3	0.5
Radioelectronic devices design and technology	210201	1 979	10 922	2 048	1.5	2.1	2.5
Computer design and technology	210202	886	3 973	586	0.7	0.8	0.7
Radio engineering	210300	691	2 658	659	0.5	0.5	0.8
Radio physics and electronics	210301	288	1 205	242	0.2	0.2	0.3
Radio engineering	210302	3 042	14 968	2 371	2.3	2.8	2.9
Home radio electronic devices	210303	750	3 613	588	0.6	0.7	0.7
Radioelectronic systems	210304	829	4 112	741	0.6	0.8	0.9
Electronic warfare devices	210305	128	557	39	0.1	0.1	0.05
Audiovisual devices	210312	485	2 062	257	0.4	0.4	0.3

Subject	OKSO code	Total			Percentage of all ICT students		
		Admitted	Studying	Graduated	Admitted	Studying	Graduated
Telecommunications	210400	492	2 645	525	0.4	0.5	0.6
Optical communications physics and technology	210401	379	1 945	332	0.3	0.4	0.4
Communication with mobile objects	210402	858	3 586	416	0.7	0.7	0.5
Secure communication systems	210403	399	1 093	93	0.3	0.2	0.1
Multichannel telecommunication systems	210404	2 261	9 534	1 582	1.7	1.8	1.9
Radio communications, radio broadcasting and television	210405	946	4 301	648	0.7	0.8	0.8
Communication networks and switching systems	210406	2 547	11 116	2 010	2.0	2.1	2.4
Automation and management							
System analysis and management	220100	416	1 505	271	0.3	0.3	0.3
Automation and management	220200	1 884	7 483	1 659	1.4	1.4	2.0
Management and informatics in technical systems	220201	3 933	20 860	2 965	3.0	4.0	3.6
Ship management and control systems	220202	39	184	13	0.03	0.04	0.02
Autonomous information and control systems	220203	227	1 037	224	0.2	0.2	0.3
Automation of production and technological processes (by industry)	220301	8 315	38 601	6 452	6.4	7.3	7.8
Mechatronics	220401	684	2 703	251	0.5	0.5	0.3
Robots and robotic systems	220402	702	4 156	752	0.5	0.8	0.9
Informatics and computers							
Informatics and computers	230100	6 042	23 447	3 691	4.6	4.5	4.5
Computers, computer complexes, systems and networks	230101	7 234	31 542	4 955	5.6	6.0	6.0
Automated systems for data processing and management	230102	6 264	28 366	4 439	4.8	5.4	5.4
Computer aided design systems	230104	1 625	7 795	1 230	1.2	1.5	1.5
Software for computers and automated systems	230105	6 732	5 919	119	5.2	1.1	0.1
Information systems	230200	147	286	15	0.1	0.1	0.02
Information systems and technologies	230201	9 840	35 856	4 020	7.6	6.8	4.9
Information technologies in education	230202	295	798	-	0.2	0.2	-
Applied mathematics	230401	1 489	6 457	741	1.1	1.2	0.9

Table V.3. Higher education institutes that train ICT professionals

Location	*Number of institutes*
The Russian Federation	**60**
Central Federal District	
Voronezh region	4
Kursk region	1
Lipetsk region	1
Moscow region	1
Tambov region	1
Tver region	2
Yaroslavl region	1
Moscow	16
North-Western Federal District	
Republic of Karelia	1
Arkhangelsk region	1
Kaliningrad region	1
Novgorod region	1
Pskov region	1
Saint Petersburg	2
Southern Federal District	
Republic of Karachaevo-Cherkessia	1
Krasnodar Territory	4
Stavropol Territory	2
Volgograd region	1
Rostov region	2
Privolzhsky (Volga) Federal District	
Republic of Chuvashia	1
Nizhny Novgorod region	1
Samara region	2
Ulyanovsk region	1
Ural Federal District	
Chelyabinsk region	1
Siberian Federal District	
Republic of Altay	1
Republic of Khakassia	2
Irkutsk region	1
Kemerovo region	2
Novosibirsk region	3
Tomsk region	1

Table VI.1. ICT use by gender, age and level of education

(Percentage of those surveyed in each group)

	All	Gender		Age					Level of education		
	Aged 16-74	*Male*	*Female*	*16-24*	*25-34*	*35-44*	*45-54*	*55-64*	*65-74*	*Lower than secondary*	*Secondary*	*Tertiary*
Persons in each group	**2 000**	**924**	**1 076**	**362**	**416**	**317**	**420**	**235**	**250**	**396**	**746**	**858**
Access to ICT at home												
Mobile telephone	**59.1**	61.3	57.2	78.6	84.0	66.5	51.7	30.1	19.8	36.2	59.9	69.0
Desktop computer	**22.4**	24.8	20.3	35.0	25.4	31.2	21.2	5.9	5.3	11.2	18.5	30.9
Internet	**14.2**	16.0	12.6	22.7	21.3	13.7	12.7	3.3	3.3	7.3	11.4	19.8
Cable television	**12.9**	12.4	13.3	12.8	19.4	9.1	17.8	8.1	3.2	7.1	11.0	17.2
Satellite dish	**1.6**	1.4	1.7	3.8	1.7	2.1	0.6	0.5	..	0.1	1.8	2.0
Portable computer (laptop)	**1.0**	1.6	0.5	1.8	0.7	0.3	0.8	0.1	2.4	0.1	0.9	1.6
Handheld computer (palmtop)	**0.2**	0.2	0.2	0.4	0.5	0.1	0.0	0.2	..	0.1	0.2	0.3
Mobile telephone users	**53.5**	55.6	50.8	74.9	80.5	58.3	41.6	23.8	15.5	32.5	53.2	62.4
Frequency with which personal computers are used												
Within the last three months	**30.9**	31.4	30.4	62.3	39.1	30.5	24.5	8.7	3.6	12.9	27.3	42.3
Between three months and one year ago	**6.0**	7.4	4.8	12.4	10.3	6.2	2.4	1.3	..	2.8	6.6	7.0
More than one year ago	**5.9**	6.3	5.6	6.2	10.1	4.3	6.1	56	0.6	1.7	7.3	6.7
Never	**57.2**	54.9	59.2	19.0	40.5	58.9	67.0	84.4	95.8	82.7	58.8	44.0
Share of active personal computer users*	**24.7**	24.9	24.4	51.7	31.3	25.7	17.2	6.1	3.3	9.7	20.2	35.6
*Location where computers are used***												
Home	**16.3**	19.9	13.2	32.0	21.7	16.1	13.3	1.9	3.1	8.5	14.2	21.7
Place of work (other than home)	**12.8**	9.6	15.5	15.2	17.9	16.9	13.1	7.0	0.6	0.4	5.8	24.6
Place of education	**2.3**	2.4	2.1	12.1	0.3	0.1	..	..	..	0.9	3.2	2.1
Other person's home	**6.7**	8.7	5.0	19.7	8.9	3.4	2.1	..	2.4	3.3	7.9	7.2
Other (e.g. library, hotel, airport, Internet café)	**0.8**	1.1	0.6	3.0	0.6	0.1	0.5	..	..	0.5	0.5	1.1
Frequency with which the Internet is used												
Within the last three months	**16.1**	18.2	14.2	34.8	22.6	13.4	10.8	2.3	3.2	2.7	12.7	25.1
Between three months and one year ago	**4.0**	5.6	2.7	13.4	5.5	1.4	1.0	0.4	..	2.8	4.5	4.2
More than one year ago	**2.2**	2.0	2.4	2.1	2.8	3.3	0.9	4.6	..	..	1.9	3.5
Never	**77.7**	74.2	80.7	49.7	69.2	82.0	87.3	92.7	96.8	94.5	80.9	67.1
Share of active Internet users*	**10.7**	12.9	8.8	21.3	16.2	9.3	7.1	1.5	2.9	1.2	7.4	17.9

	All			Gender			Age			Level of education		
	Aged 16-74	*Male*	*Female*	*16-24*	*25-34*	*35-44*	*45-54*	*55-64*	*65-74*	*Lower than secondary*	*Secondary*	*Tertiary*
*Location where Internet is used***												
Home	**8.4**	9.6	7.4	15.8	11.4	8.5	6.4	1.3	2.9	2.5	5.3	13.9
Place of work (other than home)	**6.4**	6.9	6.0	10.3	9.5	6.4	6.3	1.3	0.4	0.4	2.7	12.3
Place of education	**1.5**	2.4	0.7	7.7	0.3	0.1	..	..	..	..	1.7	1.9
Other person's home	**3.7**	5.5	2.1	11.5	5.1	1.2	0.2	..	2.4	0.3	4.4	4.6
Public library	**0.4**	0.7	0.1	1.7	0.3	0.1	0.1	..	..	..	..	0.9
Post office	**0.1**	0.2	..	0.1	0.2	..	..	..	..	..	0.1	0.1
Public office, town hall, government agency	**0.0**	0.1	..	..	0.2	..	..	..	..	..	..	0.1
Community or voluntary organization	**0.1**	0.2	0.1	..	0.7	..	..	..	..	..	..	0.3
Internet club, Internet café, etc.	**1.0**	1.5	0.6	4.3	0.6	..	0.5	..	..	..	1.5	1.1
Designated areas in airports, stations, hotels, restaurants, exhibition halls, etc.	**0.1**	0.2	0.1	0.3	0.3	..	..	..	..	..	0.1	0.2
Reasons for accessing the Internet												
Communication												
E-mailing	**12.3**	13.4	11.4	26.9	16.8	7.7	8.3	5.2	29	1.5	7.1	21.9
Telephoning over the Internet/ videoconferencing	**1.8**	1.4	2.1	3.1	3.4	2.3	0.6	0.2	..	1.3	0.8	2.9
Information search and online services related to												
Goods or services	**5.8**	7.0	4.8	10.5	10.7	5.2	3.4	0.9	0.4	0.1	3.2	10.7
Tourism	**2.1**	1.9	2.2	2.7	4.8	1.5	1.4	0.1	0,1	0.4	0.8	4.0
Listening to the radio, watching television	**2.2**	3.1	1.5	5.7	2.0	1.7	2.0	0.6	..	0.1	1.8	3.5
Playing or downloading games, images, music and films	**8.6**	12.0	5.8	26.2	11.9	5.4	2.4	0.5	..	3.8	8.7	10.9
Downloading software	**5.2**	7.9	2.8	14.7	5.6	2.9	3.9	0.3	0.4	1.4	3.5	8.4
Reading news, newspapers, magazines	**7.4**	9.3	5.7	14.6	10.2	4.8	4.6	4.3	2.8	0.4	4.2	13.3
Keeping personal information on specialized websites	**2.2**	2.4	1.9	5.5	3.6	1.0	0.9	0.5	..	0.1	2.1	3.1
Looking for a job or sending a job application	**4.1**	4.2	4.1	6.8	7.9	2.8	3.5	0.3	0.4	0.2	2.3	7.5
Searching for other kinds of information	**8.9**	9.0	8.7	17.0	11.9	8.9	7.0	0.8	2.8	1.5	6.8	14.2
Selling goods and services												
For example, via auctions	**1.2**	2.0	0.5	2.1	1.4	0.7	1.9	0.1	0.1	0.1	0.6	2.2
Banking	**0.9**	1.2	0.8	3.5	0.7	0.6	0.3	..	..	0.1	0.7	1.5

	All	Gender		Age					Level of education		
	Aged 16-74	*Male*	*Female*	*16-24*	*25-34*	*35-44*	*45-54*	*55-64*	*65-74*	*Lower than secondary*	*Secondary*	*Tertiary*
E-government												
Obtaining information about the schedule of such organizations	**2.1**	3.1	1.2	2.2	2.0	1.3	1.4	3.5	2.8	0.3	0.6	4.2
Downloading official forms, samples of documents	**2.2**	2.1	2.2	4.9	3.2	1.8	1.4	0.2	..	0.0	0.8	4.3
Sending in filled forms	**0.9**	1.3	0.6	2.2	1.6	0.2	0.7	0.2	..	0.0	0.6	1.7
Consultations online	**0.3**	0.4	0.3	1.2	0.3	0.3	0.2	..	..	0.2	0.0	0.7
Learning												
Looking for information about education, training or courses offered, etc**.**	**4.0**	4.6	3.5	10.6	4.0	2.4	3.8	0.7	0.1	1.7	2.7	6.3
Consulting with the purpose of learning	**1.6**	2.0	1.3	4.6	1.4	1.5	1.1	0.2	..	..	0.7	3.2
Courses for raising the skills level	**1.3**	1.3	1.3	1.7	1.0	1.7	2.1	0.6	..	0.1	0.5	2.5
Courses not for work	**1.8**	2.9	0.9	5.5	1.5	1.2	1.7	..	..	..	1.9	2.6
Formal education (school, university, etc.)	**0.6**	0.7	0.5	2.1	1.0	..	..	..	..	0.0	0.9	0.6
Health, medical services												
Seeking health related information (e.g. nutrition, injury, disease, etc.)	**3.2**	3.3	3.0	5.6	3.3	3.6	1.8	1.3	2.8	0.8	1.1	6.1
Seeking information about health services (clinics, hospitals, etc.)	**1.2**	1.2	1.2	2.8	1.4	1.5	0.8	0.2	..	0.1	0.8	2.1
Making online appointments with a doctor for a consultation	**0.2**	0.3	0.1	0.8	0.1	0.1	..	..	..	..	0.4	0.1
Medical advice online from a practitioner	**0.1**	..	0.1	0.2	0.1	0.1	0.0	..	..	..	..	0.2
Goods and services purchased via the Internet												
Never bought or ordered	**96.6**	95.8	97.3	91.2	95.6	97.4	97.6	99.9	99.9	99.4	97.1	94.9
More than one year ago	**0.8**	0.8	0.8	2.3	1.0	0.8	0.3	..	..	0.1	0.7	1.2
Between three months and one year ago	**1.4**	1.6	1.2	3.5	1.8	1.3	0.8	..	0.1	0.5	0.6	2.5
Within the last three months	**1.2**	1.8	0.7	3.0	1.6	0.5	1.3	0.1	..	..	1.6	1.4
Types of goods and services ordered over the Internet for private use in the last 12 months												
Films, music	**0.8**	0.9	0.7	2.4	1.0	0.3	0.5	..	..	0.1	1.1	0.8
Books, magazines, newspapers, e-learning materials	**0.7**	0.9	0.6	1.6	1.4	0.3	0.4	..	0.1	0.2	0.8	0.8
Computer software and upgrades	**0.5**	0.8	0.2	1.1	0.3	0.2	1.0	..	..	..	0.3	0.9
Other household goods	**0.5**	0.9	0.2	..	0.6	0.3	1.6	0.1	..	0.2	0.1	1.0
Travel and holiday accommodation	**0.3**	0.1	0.4	0.3	0.5	0.1	0.4	..	..	..	0.1	0.6
Tickets for events	**0.2**	0.3	0.1	0.8	0.1	0.1	..	..	..	0.1	0.3	0.1

	All	Gender		Age					Level of education		
	Aged 16-74	*Male*	*Female*	*16-24*	*25-34*	*35-44*	*45-54*	*55-64*	*65-74*	*Lower than secondary*	*Secondary*	*Tertiary*
Appliances such as mobile telephones and televisions	**0.4**	0.6	0.3	0.6	0.3	0.5	0.9	..	..	0.0	0.1	0.9
Computer hardware	**0.4**	0.5	0.3	1.1	0.5	0.1	0.2	..	..	..	0.0	0.8
Clothes, sports goods	**0.1**	0.0	0.1	0.1	0.2	0.1	0.1	..	..	..	0.0	0.2
Foods	**0.1**	0.1	0.0	0.1	..	..	0.2	0.1	..	0.2	..	0.1
Shares, financial services, insurance	**0.0**	0.0	..	..	0.0	..	..	..	..	..	..	0.0
Lotteries or betting	**0.1**	..	0.1	..	0.1	0.1	..	..	..	..	..	0.1
Other	**0.1**	..	0.2	0.1	0.1	0.3	0.2	..	..	..	0.0	0.3
Barriers to e-commerce												
Have no need	**14.0**	16.8	11.7	34.6	19.7	10.7	5.8	6.0	0.3	3.9	12.7	19.9
Prefer to shop in person, like to see product, loyalty to shops, force of habit	**6.9**	7.4	6.4	11.0	10.6	7.3	4.8	1.3	2.8	1.1	5.3	10.8
Doubts about the quality of the goods and services	**3.0**	3.0	2.9	4.2	4.5	2.5	3.7	0.2	0.4	0.0	1.1	5.9
Concerns about receiving and returning goods, concerns about complaints and redress	**1.9**	1.8	1.9	2.9	2.6	2.1	2.1	..	..	..	1.1	3.4
Doubts about safety of payment procedure	**1.6**	1.5	1.8	2.2	3.4	2.4	0.7	0.2	..	..	0.7	3.2
Costs are too high	**1.2**	1.9	0.6	3.4	1.3	0.9	0.7	0.1	..	0.4	1.0	1.7
Lack of skills	**0.8**	0.5	1.1	1.5	0.4	0.3	2.1	..	..	..	0.7	1.3
Procedure for buying is too difficult (need to register)	**0.6**	0.3	0.9	0.9	0.2	0.2	1.8	..	..	..	0.2	1.3
Payment system is uncomfortable, lack of card that allows payment over the Internet	**0.6**	0.7	0.6	1.0	1.6	0.5	..	0.1	..	..	0.2	1.2
No information concerning guarantee of service	**0.5**	0.5	0.5	2.0	0.5	0.5	..	..	..	..	0.8	0.5
Delivery period is too long or goods are delivered at an inconvenient time of day	**0.4**	0.7	0.2	1.9	0.1	0.2	0.2	..	..	..	..	1.0
Buying procedure is too long	**0.3**	0.3	0.2	0.6	0.5	..	0.2	..	..	..	0.1	0.6
Not always possible to find the needed goods (poor assortment)	**0.2**	0.3	0.1	0.7	0.3	0.2	..	..	..	..	0.3	0.2
Others	**0.1**	0.1	0.1	0.3	..	..	0.1	..	..	..	0.1	0.1
Barriers to using the Internet or to using it more												
No need for the Internet	**61.2**	60.2	62.0	33.8	43.2	57.7	75.3	84.1	90.2	77.0	62.7	52.6
Connection costs are too high	**15.3**	16.4	14.3	28.2	22.3	17.7	7.0	7.3	3.2	10.9	14.5	18.1
Lack of skills or knowledge	**11.9**	10.4	13.2	9.3	20.6	12.8	11.1	7.8	5.5	9.4	14.3	11.1
Lack of time	**10.7**	11.1	10.3	16.6	12.9	13.3	10.5	5.0	0.7	2.1	7.5	17.4

	All	Gender		Age					Level of education		
	Aged 16-74	*Male*	*Female*	*16-24*	*25-34*	*35-44*	*45-54*	*55-64*	*65-74*	*Lower than secondary*	*Secondary*	*Tertiary*
Cannot access the Internet from our region, house	**8.5**	7.9	9.0	18.9	8.7	6.3	4.6	7.2	3.4	5.6	10.2	8.3
Lack of foreign language skills	**5.2**	5.1	5.2	8.5	11.2	3.0	3.2	1.3	..	3.0	7.1	4.5
Slow speed of Internet connection	**3.1**	3.4	2.9	5.9	4.0	2.9	0.2	3.6	2.6	0.2	2.8	4.8
Security or privacy concerns	**1.4**	2.0	0.8	2.5	2.4	1.5	0.7	0.5	..	0.1	1.5	1.8
Content is not sufficiently interesting to make more use or the Internet	**0.9**	0.7	1.0	1.0	0.6	1.0	1.2	0.3	0.7	1.0	0.6	1.0
Others	**4.9**	3.9	5.7	6.9	9.2	4.9	3.0	1.3	1.2	3.4	5.5	5.0
Computer skills												
Can copy and move a file or folder	**30.8**	29.5	31.9	65.8	38.8	30.2	20.8	10.7	3.4	9.6	25.3	45.4
Can use copy and paste tools to duplicate and move information	**26.6**	25.1	27.8	56.1	33.3	26.9	17.5	9.6	3.3	6.9	20.6	40.8
Can use basic arithmetic formulas in a spreadsheet	**23.0**	21.8	24.1	52.5	32.7	18.1	15.5	4.4	0.7	5.8	20.0	33.6
Can compress files	**16.9**	18.6	15.5	39.2	23.0	14.6	9.9	2.5	2.9	3.5	14.2	25.5
Can install new standard programs	**15.4**	19.8	11.7	37.8	25.8	12.4	5.0	1.1	0.7	5.4	16.3	19.3
Can connect and install new devices	**14.1**	18.1	10.7	38.3	19.8	9.6	5.1	0.8	3.1	2.7	14.7	18.9
Can write a computer program using specialized programming language	**3.6**	5.6	2.0	11.9	4.9	1.9	0.7	0.1	--	0.8	3.8	4.8
Can detect and solve computer problems (e.g. computer runs slowly)	**9.8**	13.4	6.7	27.3	16.3	3.8	4.0	0.6	--	3.1	9.0	13.6
None of the above	**64.4**	65.1	63.8	26.1	52.0	66.2	76.7	87.2	96.3	88.9	68.6	49.4
Internet skills												
Can use a search engine to find information	**16.3**	18.6	14.4	36.3	20.9	13.0	10.8	5.9	3.2	1.9	11.9	26.9
Can send e-mails with attached files	**10.6**	11.6	9.8	22.3	14.0	6.7	7.8	5.4	2.9	1.4	6.0	19.0
Can post messages in chat rooms, newsgroups or other online discussion forums	**4.5**	5.2	3.9	11.5	7.9	3.3	1.2	--	--	0.9	3.5	7.0
Can using the Internet to make telephone calls	**1.2**	0.6	1.7	2.1	2.4	0.8	0.6	0.2	--	0.0	0.5	2.2
Can use peer-to-peer file sharing to exchange movies, music etc.	**1.2**	1.8	0.8	3.7	1.7	0.4	0.8	--	--	2.0	1.1	1.0
Can create a Web page	**1.0**	1.7	0.4	1.9	1.2	2.1	0.2	--	--	0.1	0.6	1.7
Can search for, download and install programs	**6.2**	9.2	3.7	20.4	5.6	4.4	2.7	0.4	0.4	2.3	4.7	9.3
Can diagnose and remove viruses from a computer	**3.3**	5.2	1.7	8.8	3.8	1.9	2.7	--	0.4	0.8	2.4	5.2

	All	Gender		Age					Level of education		
	Aged 16-74	*Male*	*Female*	*16-24*	*25-34*	*35-44*	*45-54*	*55-64*	*65-74*	*Lower than secondary*	*Secondary*	*Tertiary*
Training courses on any aspect of computer use												
Never	**81.5**	85.0	78.5	49.3	78.6	86.1	89.5	96.9	99.5	91.8	85.3	73.5
More than three years ago	**8.9**	6.4	11.1	14.3	13.8	10.4	7.1	2.3	0.5	1.7	4.5	16.1
Between one and three years ago	**5.0**	4.2	5.8	17.7	4.2	1.8	2.9	0.5	--	1.9	4.4	7.0
Between three months and one year ago	**1.6**	1.5	1.7	5.5	2.0	0.7	0.4	--	--	0.7	2.4	1.3
Within the last three months	**2.9**	2.9	3.0	13.3	1.3	1.1	0.1	0.3	--	3.9	3.3	2.2

* Persons who use the computer/ Internet once a day or at least once a week.
** In the last three months.

Table VI.2. ICT usage by user's location, level of income and type of work

(Percentage of those surveyed in each group)

	Location					*Level of income*				*Type of work*							
	Moscow	*Other big town*	*Mid-sized town*	*Small town*	*Village*	*Low (bottom quintile)*	*Middle*	*High (top quintile)*	*Manager*	*Specialist*	*White collar*	*Skilled worker*	*Unskilled worker*	*Student*	*Pensioner*	*Housewife*	*Unemployed*
Persons in each group	**119**	**429**	**403**	**542**	**507**	**385**	**1103**	**365**	**73**	**232**	**198**	**425**	**121**	**135**	**473**	**115**	**137**
Access to ICTs at home																	
Mobile telephone	75.1	69.0	58.8	55.5	51.1	52.7	53.2	77.9	90.4	77.6	75.7	66.1	48.0	84.5	24.6	77.9	43.6
Desktop computer	49.6	30.0	21.6	21.2	11.4	14.4	17.6	42.1	58.2	38.6	24.6	20.6	7.3	45.3	5.3	20.9	16.0
Internet	36.7	23.4	11.5	13.2	4.3	6.0	10.8	30.5	31.0	27.3	18.5	11.9	6.4	25.0	3.6	10.1	12.5
Cable television	20.3	16.6	15.4	16.1	2.5	6.3	12.4	23.0	27.0	15.1	23.0	13.3	5.5	10.9	4.7	22.7	10.3
Satellite dish	2.7	2.2	2.1	1.0	0.9	0.7	1.3	2.3	5.4	1.7	1.4	1.4	1.0	6.4	0.2	1.4	0.2
Portable computer (laptop)	4.8	2.6	0.4	0.3	..	..	0.5	3.7	2.1	1.7	0.3	0.1	0.4	3.3	1.3	0.2	..
Handheld computer (palmtop)	2.0	0.3	0.1	..	..	..	0.0	1.0	2.6	0.2	..	0.1	..	0.4	..	0.2	..
Mobile telephone users	64.6	62.3	52.3	50.2	46.1	45.1	47.8	72.4	77.1	71.7	67.3	61.6	42.4	81.5	19.7	62.8	40.7
Frequency with which personal computers are used																	
Within the last three months	49.1	40.2	32.6	30.1	18.2	19.4	26.0	51.7	76.8	62.3	46.9	21.4	8.1	69.8	4.4	20.0	23.8
Between three months and one year ago	6.8	4.8	5.4	7.4	5.9	4.6	5.7	8.6	4.4	6.6	8.3	7.2	2.6	18.7	0.3	4.5	6.4
More than one year ago	4.6	6.7	9.4	2.5	6.5	4.5	7.2	4.5	0.9	3.0	5.2	8.1	12.6	3.3	3.3	17.5	7.0
Never	39.4	48.3	52.6	60.1	69.4	71.5	61.1	35.2	17.9	28.1	39.7	63.4	76.7	8.1	92.1	58.0	62.8
Share of active PC-users*	40.9	31.6	26.9	23.7	14.4	14.7	19.6	44.7	71.7	53.2	36.3	16.0	4.8	59.6	3.1	14.0	17.2
*Location where computers are used ** *																	
Home	39.5	23.0	15.4	14.5	7.7	8.5	12.2	33.7	46.6	25.7	18.1	12.9	3.9	40.8	3.4	12.7	11.1
Place of work (other than home)	20.2	16.5	18.8	9.8	6.3	5.3	10.8	24.8	57.0	46.5	28.8	4.6	0.9	6.0	0.3	2.1	3.1
Place of education	2.0	3.2	1.4	3.0	1.4	2.7	1.9	2.2	3.8	0.9	2.3	0.7	..	20.3	..	..	2.3
Other person's home	2.9	6.8	7.1	8.6	5.2	4.5	6.8	7.1	5.6	7.7	6.9	5.0	3.7	20.0	2.0	6.4	14.2
Other (e.g. library, hotel, airport, Internet café, etc.)	1.5	0.8	1.5	0.8	0.1	0.1	0.6	1.0	1.0	0.5	1.0	0.2	..	7.2	..	0.3	..
Frequency with which the Internet is used																	
Within the last three months	37.4	26.8	15.7	13.3	5.2	5.8	11.2	37.3	47.1	36.9	17.6	11.3	3.3	44.3	2.1	10.8	11.1
Between three months and one year ago	6.5	5.1	3.8	3.5	3.4	4.2	3.6	4.8	6.2	5.1	5.8	2.8	0.4	16.1	..	2.4	4.9
More than one year ago	2.4	4.1	1.0	1.8	2.0	2.0	2.6	1.5	7.9	1.4	4.4	0.4	0.8	1.2	0.5	4.2	9.3
Never	53.7	64.1	79.5	81.4	89.5	87.9	82.7	56.4	38.8	56.6	72.3	85.5	95.5	38.4	97.4	82.7	74.7
Share of active Internet users*	31.4	18.9	8.9	8.3	2.8	2.5	7.2	27.3	39.6	23.7	13.6	6.5	0.8	27.1	2.1	6.2	8.6

	Location					Level of income					Type of work						
	Moscow	*Other big town*	*Mid-sized town*	*Small town*	*Village*	*Low (bottom quintile)*	*Middle*	*High (top quintile)*	*Manager*	*Specialist*	*White collar*	*Skilled worker*	*Unskilled worker*	*Student*	*Pensioner*	*Housewife*	*Unemployed*
Location where the Internet is used **																	
Home	27.7	15.5	6.9	5.8	2.0	1.9	5.6	22.2	20.1	19.2	8.1	6.9	1.6	19.3	2.0	7.9	5.4
Place of work (other than home)	15.6	11.5	7.8	4.1	1.2	0.4	3.8	19.4	42.9	24.2	9.7	2.8	..	3.6	0.0	0.7	0.3
Place of education	1.8	2.8	0.9	1.6	0.6	0.5	1.1	3.1	3.8	0.4	1.0	1.0	..	13.1	..	..	1.2
Other person's home	3.6	5.6	3.7	4.2	1.6	2.0	2.7	6.2	1.3	4.5	1.4	3.4	1.7	13.3	1.4	1.6	8.1
Public library	0.5	0.3	..	0.6	0.6	..	0.4	0.3	1.2	0.4	0.5	..	..	3.9	..	0.2	..
Post office	..	0.1	..	0.2	..	..	0.1	..	..	..	0.5	..	..	0.4	..	..	..
Public office, town hall, government agency	..	..	..	0.2	..	..	0.1	..	..	..	0.5	..	..	..	..	..	..
Community or voluntary organization	0.2	..	0.4	0.2	..	..	0.1	0.5	0.8	0.1	0.5	..	..	..	..	..	..
Internet club, Internet café, etc.	1.4	0.8	0.4	1.5	1.1	1.9	0.4	0.9	1.0	0.1	1.0	0.2	..	10.6	..	1.3	..
Designated areas in airports, stations, hotels, restaurants, exhibition halls, etc.	0.2	..	0.2	0.3	..	..	0.2	0.0	..	0.1	0.5	..	..	0.9	..	..	..
Reasons for accessing the Internet																	
Communication																	
E-mailing	29.8	21.8	13.4	9.1	2.9	3.1	8.9	30.8	47.0	29.8	19.6	3.9	0.9	31.6	2.1	7.2	12.1
Telephoning over the Internet/ videoconferencing	5.5	2.9	1.4	1.7	0.3	0.4	1.4	3.3	3.8	3.0	1.2	2.6	1.7	1.2	0.0	2.5	3.4
Information search and online services related to																	
Goods or services	19.2	10.9	4.8	4.0	1.1	0.9	2.6	18.0	27.0	13.9	10.7	3.6	..	5.9	0.1	4.8	3.8
Tourism	13.7	2.9	1.7	0.9	0.2	0.0	0.8	6.5	4.3	7.5	1.8	0.1	..	1.1	..	3.8	4.3
Listening to the radio, watching television	8.6	4.2	1.0	2.1	0.2	0.4	2.0	5.4	3.5	5.3	2.5	1.6	1.8	4.6	0.4	0.9	2.0
Playing or downloading games, images, music and films	14.7	13.3	6.6	8.3	5.2	6.0	7.3	14.8	18.2	11.6	7.7	7.9	1.8	35.1	0.1	4.4	11.9
Downloading software	12.3	8.0	3.7	5.8	1.8	1.0	4.2	11.0	20.0	10.1	6.7	2.7	..	19.6	0.7	1.8	0.8
Reading news, newspapers, magazines	20.5	13.5	5.8	5.3	2.5	0.9	5.2	18.4	26.6	13.9	11.4	2.7	0.6	16.1	2.1	5.2	10.5
Keeping personal information on specialized websites	5.5	3.2	1.5	2.5	0.6	0.1	1.7	5.9	3.7	4.4	5.5	0.4	0.2	8.7	..	1.6	1.1
Looking for a job or sending a job application	10.3	9.6	2.8	2.8	0.5	1.2	2.0	13.3	16.0	8.8	11.7	1.3	0.2	4.8	0.2	2.7	6.2
Search for other types of information	18.8	15.8	8.8	6.7	3.0	4.6	5.7	20.6	35.1	18.1	13.9	4.4	1.2	23.4	1.9	5.4	5.2
Selling goods or services																	
For example, at auctions	4.6	1.4	1.9	0.9	..	0.2	0.4	5.0	11.4	3.5	0.4	0.3	..	1.4	0.3	0.3	..
Banking	3.1	2.0	0.8	0.6	..	..	0.4	2.9	4.1	3.0	0.8	0.1	..	2.3	..	0.8	..

	Location				*Level of income*					*Type of work*							
	Moscow	*Other big town*	*Mid-sized town*	*Small town*	*Village*	*Low (bottom quintile)*	*Middle*	*High (top quintile)*	*Manager*	*Specialist*	*White collar*	*Skilled worker*	*Unskilled worker*	*Student*	*Pensioner*	*Housewife*	*Unemployed*
E-government																	
Obtaining information about the schedule of such organizations	10.7	5.4	0.6	0.2	0.5	0.2	1.4	6.4	5.9	5.6	1.8	0.3	..	1.1	1.6	0.4	6.7
Downloading official forms, samples of documents	6.1	2.8	3.4	1.5	0.4	0.2	1.0	6.0	11.9	7.6	1.7	0.5	..	3.7	..	2.3	2.8
Sending in filled forms	3.4	1.2	1.0	0.9	0.2	0.6	0.7	1.8	4.3	2.9	1.9	0.1	1.7	0.7	..	..	..
Consultations online	1.5	0.2	0.2	0.6	..	..	0.2	1.4	2.0	0.7	0.1	0.1	..	2.0	..	0.5	..
Learning																	
Looking for information about education, training and courses offered, etc.	9.7	6.8	3.8	3.3	1.4	3.1	2.9	7.3	10.5	7.5	5.3	0.8	..	20.3	0.3	1.1	3.9
Consulting with the purpose of learning	4.4	0.8	0.6	2.3	1.7	0.2	1.6	2.9	1.4	5.2	1.1	0.4	1.7	8.7	0.1	0.8	..
Courses for raising the skills level	4.2	2.2	1.0	1.1	0.3	0.0	1.0	3.6	12.9	3.3	1.0	0.5	..	0.5	0.4	0.8	..
Courses not for work	1.8	3.7	1.8	1.8	0.4	0.7	0.8	4.5	5.8	5.0	1.1	1.0	..	6.7	0.3	..	2.9
Formal educational activities (school, university etc.)	0.5	0.2	0.9	0.2	1.1	1.6	0.1	0.3	..	..	0.5	0.2	..	4.4	..	..	2.9
Health, medical services																	
Seeking health related information (e.g. nutrition, injury, disease, etc.)	12.8	5.7	2.4	2.0	0.6	1.0	1.7	8.8	9.2	9.9	1.5	1.3	..	6.1	1.9	2.6	1.3
Seeking information about health services (clinics, hospitals, etc.)	8.1	1.9	0.7	0.5	0.3	0.1	0.7	4.2	1.8	4.6	1.3	0.3	..	3.8	0.0	2.2	0.2
Making online appointments with a doctor for a consultation	0.5	0.1	0.1	0.4	..	..	0.3	0.2	0.7	..	0.3	0.1	1.7	..	..	..	..
Medical advice online from a practitioner	0.3	0.2	0.1	..	..	..	0.0	0.3	0.3	0.5	0.1	..	..	..	..	..	..
Frequency with which goods and services are purchased over the Internet																	
Never bought or ordered	85.2	94.8	96.9	97.6	99.4	99.2	98.5	88.9	89.2	91.1	97.1	97.6	98.3	92	99.9	96.3	99.7
More than one year ago	4.7	0.1	1.6	0.6	0.1	0.0	0.5	2.1	1.3	1.1	0.7	0.3	..	3.3	..	2.4	0.5
Between three months and one year ago	6.8	2.1	0.6	1.3	0.2	0.3	0.6	4.8	2.2	5.9	1.1	0.3	1.7	3.3	0.1	0.8	0.2
Within the last three months	3.3	3.0	0.9	0.5	0.3	0.5	0.4	4.2	7.3	1.9	1.1	1.8	..	1.4	..	0.5	..
Types of goods and services ordered over the Internet for private use in the last 12 months																	
Films, music	2.7	2.4	0.1	0.1	0.3	0.5	0.4	2.2	0.8	1.9	1.2	1.2	..	2.2	..	0.2	..
Books, magazines, newspapers, e-learning materials	3.4	1.0	0.8	0.5	0.0	0.5	0.4	1.2	2.0	2.4	..	0.3	..	1.8	..	0.3	0.2
Computer software and upgrades	0.7	1.2	0.1	0.6	0.0	0.1	0.1	2.3	5.1	0.3	0.3	0.2	..	2.7	0.0	..	..
Other household goods	2.9	0.9	0.7	..	..	0.0	0.0	2.4	6.3	1.9	..	0.2	..	..	0.0	..	..
Travel and holiday accommodation	2.7	0.4	..	..	0.1	0.0	..	1.3	2.3	1.3	0.2	..	..	..	..	..	..

	Location				*Level of income*					*Type of work*							
	Moscow	*Other big town*	*Mid-sized town*	*Small town*	*Village*	*Low (bottom quintile)*	*Middle*	*High (top quintile)*	*Manager*	*Specialist*	*White collar*	*Skilled worker*	*Unskilled worker*	*Student*	*Pensioner*	*Housewife*	*Unemployed*
Tickets for events	0.3	0.2	0.1	0.4	..	..	0.2	0.3	1.3	0.1	..	..	1.7	..	..	0.5	..
Home appliances such as mobile telephones and televisions	2.9	1.0	..	0.1	0.1	0.1	0.0	2.2	5.3	0.8	0.6	0.1	..	0.3	0.0	0.3	..
Computer hardware	2.1	0.9	..	0.2	..	..	0.1	1.7	1.2	2.3	0.5	0.1	..	..	..	..	..
Clothes, sports goods	0.5	0.1	0.2	..	..	..	..	0.4	0.4	0.3	..	0.1	..	0.2	..	..	..
Foods	1.0	..	0.1	..	..	..	..	0.1	..	0.4	..	0.0	..	0.2	..	..	..
Shares, financial services, insurance	0.2	..	..	..	..	..	..	0.0	..	0.1	..	..	..	..	..	..	..
Lotteries or betting	0.2	..	0.1	..	..	..	..	0.2	1.1	..	..	..	..	..	..	..	..
Other	1.1	..	0.1	..	0.2	..	0.0	0.6	..	1.0	..	..	..	..	..	0.2	..
Barriers to e-commerce																	
Have no need	28.1	18.9	13.2	12.8	8.6	9.8	11.8	21.1	43.7	21.7	17.7	9.5	2.8	44.2	0.4	11.8	18.4
Prefer to shop in person, like to see the products, loyal to shops, force of habit	12.3	13.4	5.4	5.2	3.0	2.6	5.0	17.5	20.5	15.1	11.8	3.4	0.5	12.8	2.2	4.3	5.0
Doubts about the quality of the goods and services	5.9	6.7	2.2	2.3	0.4	0.6	2.4	6.5	6.0	7.1	5.4	1.8	..	4.4	0.2	1.5	5.5
Concerns about receiving or being able to return goods, complaint and redress concerns	2.2	3.7	2.2	1.6	0.2	0.4	1.4	4.5	6.9	5.0	3.4	0.4	0.5	3.9	..	1.2	3.1
Doubts about the safety of the payment procedure	2.2	3.0	1.7	1.7	0.3	0.8	1.5	1.9	1.9	2.5	3.4	0.5	..	5.3	..	2.1	4.3
Costs are too high	1.4	1.5	1.7	0.4	1.4	0.3	1.5	1.0	0.5	0.5	0.5	1.1	..	8.6	..	0.7	0.5
Lack of skills	0.2	2.1	0.4	0.7	0.4	0.5	0.2	3.1	2.1	3.7	0.6	0.1	..	2.1	..	..	..
The buying procedure is too difficult, need to register	0.7	2.1	0.4	0.2	..	0.3	0.2	2.5	0.5	3.7	0.4	0.1	..	1.0	..	..	..
The payment system is uncomfortable, do not have a card that allows payment over the Internet	0.4	0.4	1.0	0.9	0.2	0.2	0.4	0.9	4.5	0.3	1.4	0.1	..	0.3	..	0.3	2.6
No information concerning guaranteed service	0.5	0.3	0.1	0.9	0.7	0.2	0.5	1.1	1.1	0.1	0.8	0.3	..	2.7	..	..	..
The delivery period is too long, delivery is at an inconvenient time of day	0.9	0.2	0.2	0.5	0.6	0.1	0.3	1.2	4.5	0.4	0.1	..	..	2.4	..	..	..
Buying procedure is too long	1.6	0.5	0.3	..	..	..	0.3	0.5	..	0.3	0.8	..	..	0.9	..	..	1.0
Not always possible to find what is needed (poor assortment)	0.9	0.2	0.4	..	0.1	..	0.3	0.3	1.1	0.4	0.4	..	..	1.3	..	..	..
Other	..	..	0.1	0.2	..	..	0.1	..	0.7	..	0.2	..	..	0.4	..	..	..

	Location					Level of income				Type of work							
	Moscow	*Other big town*	*Mid-sized town*	*Small town*	*Village*	*Low (bottom quintile)*	*Middle*	*High (top quintile)*	*Manager*	*Specialist*	*White collar*	*Skilled worker*	*Unskilled worker*	*Student*	*Pensioner*	*Housewife*	*Unemployed*
Barriers to using the Internet or to using it more																	
Have no need	47.9	51.1	64.5	66.1	65.0	63.3	64.9	50.1	31.8	43.6	44.4	66.7	67.5	22.8	90.2	54.7	59.9
Connection costs are too high	18.6	18.4	14.4	15.6	12.3	16.4	15.4	14.6	11.1	15.7	16.0	12.7	19.5	38.4	4.2	11.4	27.3
Lack of skills or knowledge	14.3	13.1	11.7	11.2	11.4	12.3	10.6	15.3	8.8	13.9	17.2	13.9	16.8	13.5	7.2	11.0	7.9
Lack of time	26.0	13.9	9.3	9.3	6.9	7.7	7.8	21.8	36.4	24.5	16.8	7.3	1.1	20.2	1.4	11.0	5.1
Cannot access the Internet from our region, house	2.2	4.9	7.2	6.5	16.1	7.1	10.2	6.2	7.4	4.0	9.8	9.5	9.3	21.2	2.8	7.9	13.0
Lack of foreign language skills	6.5	5.9	4.9	3.2	6.5	6.3	3.8	8.0	8.0	9.0	6.5	5.8	9.0	10.9	0.6	1.7	2.5
Slowness of Internet connection	3.4	5.8	3.1	2.2	1.8	2.2	2.7	4.4	8.6	3.0	1.6	1.9	2.8	7.3	1.4	1.5	10.2
Security or privacy concerns	2.2	1.1	2.1	1.5	0.7	1.7	1.2	1.2	2.1	2.5	1.8	1.3	..	3.6	..	3.7	1.2
Content is not interesting enough to make more use or the Internet	2.4	1.1	1.0	0.5	0.5	0.6	0.5	1.7	3.3	1.7	1.6	0.3	0.5	1.6	0.4	1.1	..
Other	5.9	8.5	3.6	3.8	3.7	5.2	3.8	7.1	6.7	5.9	12.0	4.1	2.3	4.4	1.9	10.6	1.8
Computer skills																	
Can copy or move a file or folder	48.4	40.0	33.4	30.7	16.9	20.5	27.1	46.9	72.7	61.6	48.4	18.4	6.7	78.3	3.5	29.1	27.3
Can use copy and paste tools to duplicate and move information	41.9	35.7	27.9	26.0	14.8	18.2	22.7	41.8	64.3	54.6	43.9	15.2	5.7	66.4	3.7	21.4	23.0
Can use basic arithmetic formulas in a spreadsheet	33.9	28.6	25.3	23.1	14.1	13.9	20.4	35.4	62.2	49.0	36.6	13.8	4.1	61.0	2.0	24.0	16.7
Can compress files	31.2	22.6	16.9	17.4	8.2	8.9	13.4	32.5	59.2	36.5	25.2	9.6	3.2	47.2	2.0	9.8	11.0
Can install new standard programs	32.5	22.3	15.6	13.3	7.8	9.3	12.1	28.5	43.5	24.4	20.6	12.9	1.1	49.9	1.6	12.7	11.8
Can connect and install new devices	26.6	21.2	13.6	12.5	7.4	8.1	10.1	27.6	49.6	27.6	14.2	8.2	2.3	51.1	1.8	6.9	11.6
Can write a computer program using a specialized programming language	6.5	3.4	3.3	5.8	1.2	2.3	3.2	4.8	10.6	6.0	4.2	1.5	1.7	18.3	0.3	4.3	0.3
Can detect and solve computer problems (e.g. computer runs slowly)	14.4	14.0	9.5	10.7	4.6	4.4	8.6	17.3	28.7	15.4	12.7	7.7	2.1	38.7	0.3	5.0	8.4
None of the above	47.5	56.5	61.3	65.6	76.3	74.3	67.6	48.9	25.6	33.6	43.2	73.4	92.4	13.8	94.4	66.4	71.5
Internet skills																	
Can use a search engine to find information	39.3	28.2	15.5	11.0	7.3	6.7	11.7	36.7	57.1	34.0	20.3	8.8	1.7	39.0	2.5	11.9	17.4
Can send e-mails with attached files	26.0	19.1	10.0	9.1	2.0	1.8	7.3	28.3	42.1	23.5	16.4	4.0	2.1	25.7	2.1	4.9	11.7
Can post messages in chat rooms, newsgroups or other online discussion forums	15.1	6.8	3.4	4.3	1.2	1.4	3.2	10.6	12.6	9.3	8.7	1.3	..	17.5	0.3	1.0	4.8
Can use the Internet to make telephone calls	4.1	1.4	1.5	0.9	0.3	0.1	0.7	2.3	4.1	2.9	0.4	0.7	..	0.3	0.0	1.4	3.3
Can use peer-to-peer file sharing to exchange movies, music etc.	4.2	2.1	1.0	0.5	0.8	0.8	1.1	2.5	0.5	1.1	0.6	1.4	..	8.1	0.3	..	0.9

	Location				*Level of income*					*Type of work*							
	Moscow	*Other big town*	*Mid-sized town*	*Small town*	*Village*	*Low (bottom quintile)*	*Middle*	*High (top quintile)*	*Manager*	*Specialist*	*White collar*	*Skilled worker*	*Unskilled worker*	*Student*	*Pensioner*	*Housewife*	*Unemployed*
Can create a Web page	2.7	2.3	0.2	1.0	..	0.1	0.7	2.9	0.5	2.9	1.1	1.9	..	0.4	..	1.0	..
Can search, download and install programs	13.7	9.4	5.7	6.0	2.4	3.6	4.8	11.8	19.0	11.6	5.6	2.8	0.6	33.1	0.7	0.8	3.1
Can diagnose and remove viruses from a computer	7.6	5.2	1.7	4.4	0.7	1.9	1.6	9.4	14.8	6.7	5.0	0.8	..	11.3	0.5	1.1	1.5
Frequency with which training courses are attended on any aspect of computer use																	
Never	77.7	82.6	82.3	79.3	83.3	83.6	83.8	76.3	68.8	62.9	68.0	92.0	94.3	42.3	98.2	78.6	84.2
More than three years ago	11.4	7.9	11.1	9.0	7.5	7.3	8.3	11.6	20.8	24.1	21.4	3.6	3.4	8.5	1.1	11.7	5.1
Between one and three years ago	7.0	4.3	3.4	6.7	4.6	3.3	4.7	6.7	7.2	8.4	9.1	2.4	1.8	14.4	0.1	6.1	5.9
Between three months and one year ago	2.0	1.5	1.8	1.3	1.7	0.9	1.3	2.6	1.7	2.7	0.9	0.0	0.4	9.8	0.6	0.7	1.6
Within the last three months	1.9	3.7	1.4	3.7	2.9	4.9	1.9	2.7	1.5	1.9	0.7	2.0	--	25.0	--	2.8	3.2

* People who use the computer/Internet once a day or at least once a week.
** In the last three months.

References

Bøegh-Nielsen, Peter (2001). 'European Commission learnings: How to measure E-commerce?' i**n** *Proceedings of the 53rd Session*, Bulletin of the International Statistical Institute. Seoul.

European Commission (????) *i2010 – A European Information Society for growth and employment*, available from http://ec.europa.eu/information_society/eeurope/i2010/introduction/index_en.htm.

_____ (1996). *Building the European information society for us all*, Brussels.

_____ (2002). *eEurope 2005: An information society for all*, COM(2002) 263 final.

_____ (2005). *i2010 – A European information society for growth and employment*, COM(2005) 229 final.

Eurostat. http://epp.eurostat.ec.europa.eu.

_____ Available from http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-BG-06-004/EN/KS-BG-06-004-EN.PDF.

_____ (2006). *Methodological manual for statistics on the information society*, survey year 2006, vol. 2.0.

Gaslikova, I.R. and L.M. Gokhberg (2001). *Information technologies in Russia*, Moscow: CSRS.

_____ and G.G. Kovaleva (2004). 'Use of information technologies in education' **in** *Monitoring of the economics of education information*, bulletin No. 5 [7]. Moscow: HSE.

Gokhberg, L.M., editor (1996). *Statistics of science and innovation*, brief dictionary of terms, Moscow: CSRS.

_____ and I.R. Gaslikova (2000). 'Methodological basis of information technologies' statistics', **in** *Statistical Issues*, No. 3.

_____ (2002) 'Statistics of science and innovation' **in** *Course on socio-economic statistics*, textbook for higher education institutes, M.G. Nazarov, editor. Moscow: Finstatinform.

_____ (2003). Statistics of science, Moscow: TEIS.

_____ and O.R. Shuvalova (2004). *Russian public opinion on the knowledge economy: science, innovation, information technology and education as drivers of economic growth and quality of life*, The British Council.

Goskomstat Regulation of 25 March 1996, No. 20 On approval of the questionnaire form for non-recurring state statistical monitoring of ICT availability and guidance on filling it. One-time survey of global information network usage. Based on Russian Goskomstat materials. *Statistical Issues*, 2003, #10, pp 48-52.

Goskomstat Regulation of 22 April 1999, No. 27 On approval of statistical tools for usage of information technologies, production of computer hardware and software, provision of information and computing services.

Goskomstat Regulation of 28 June 2001 #46 On approval of statistical tools for statistical monitoring of activities in the service sector, transport and communications, housing maintenance and utility services, health care, law enforcement, science and innovation in 2002.

HSE (2004). *Usage of information networks in the Russian economy*, Statistical digest, Moscow. Available from http://www.gks.ru/form/Page24.html.

_____ (2005). *Information and communication technologies in the Russian economy*, 2005 Statistical digest,Moscow.

_____ (2006). *Information and communication technologies in the Russian economy*, 2006 Statistical digest, Moscow.

Nordic Council of Ministers (2005). *Indicators for the information society in the Baltic Region 2005*, TemaNord 2005: 577, Copenhagen.

OECD (2002). *Measuring the information economy*, Paris.

_____ (2004). *The economic impacts of ICTs: measurement, evidence and implications*, Paris.

_____ (2005) *Guide to Measuring the Information Society*, Paris.

_____ (2006a). *Information economy – Sector definitions based on the International Standard Industry Classification (ISIC 4)*, (DSTI/ICCP/IIS/(2006)2/FINAL.

_____ (2006b). *Classifying information and communication technology (ICT) services*, (DSTI/ICCP/IIS(2006)11/FINAL.

_____ (2006c). *Information technology outlook*, Paris.

Public Opinion Foundation (POF, 2006a). Polls Internet in Russia/Russia in the Internet. Issue No. 15, Spring. Available from http://bd.fom.ru/report/map/projects/internet/internet15/int0602#Abs1

_____ Available from http://bd.fom.ru/report/map/projects/internet/internet17/int0604

Romir Monitoring (2006a). Internet monitoring. Second quarter of 2006. Available from http://www.rmh.ru/news/res_results/294.html.

_____ (2006b). Available from http://www.rmh.ru/news/res_results/333.html

_____ (2006c). Russians believe the main advantage of e-shopping is saving time. Available from http://www.rmh.ru/news/res_results/189.html.

Shuvalova, O.R. (2005). *On usage of information technologies by population*, Educational Issues, No. 3.

United Nations (2005). *Information economy report*.

'E-Skills for Europe: towards 2010 and beyond', *Synthesis report of the European e-Skills Forum*, September 2004.

Core ICT Indicators. Partnership on Measuring ICT for Development, 2005.

European Information Technology Observatory.

http://www.glossary.ru/cgi-bin/gl_sch2.cgi?RIt(uwsg.outtul!uh$lxyiu.