

The information society in Slovakia

COUNTRY REPORT

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Summary

In following report the actual situation in Slovak Republic on the way to modern information society based on knowledge is summarized. Special attention is devoted to the education and educational system and to changes in them during last years. In society informatization process very important role has the government and its policy. Without political and economical support of government and ministries this process not will be enough effective. Therefore a short review of documents and government activities, which have regulated and controlled this processes are in the report. A separated part of report is focused on the public administration and services.

Introduction

The recent societies have several typical features. The main of them are the globalization, decentralization, informatization, digitalisation, information and communication technologies etc. The changes have a very high speed. Things, effects, phenomena, which were a short time before unknown, actually significantly influence the every day life of citizens. Young people are not able to imagine her/his life without them and most of the old people have inferiority complex and are not able to adapt to the new situation. But everybody strives for better living.

New technologies allow us to use new possibilities on labour market and force us to live intensively and take part in a global competition. Big and rapid changes result that people have to change his/her qualification several times during his/her active ages.

It is very hard and sophisticated to prepare a long time actual education curricula for a profession and for rapid changes in all field of labour market. For life in information society are actual and typical permanent re-qualification and life-long learning. The situation in Slovak Republic is similar.

A great attention is devoted to the transformation of the Slovak society into an information society based on knowledge. Before Slovakia has entered to the European Union the results of international statistics, in this field was for us not pleasant. For realization of needed intensive changes few new institutions and new departments of Education and Transport, Post and Communication Ministries were established. These institutions and departments impute to control and regulation of those processes.

Information society politics

I. Policy of society informatization in Slovak Republic

The first step was to elaborate a strategy plan for informatization process of society named „*Politika informatizácie spoločnosti v Slovenskej republike*“ (**Policy of society informatization in Slovak Republic**). This necessity was formulated in resolution № 522 of Slovak government accepted on 13th of June 2001. The Slovak government officially connected and supported the eEurope initiative by this resolution.

In the year 2001 Research Institution for Communication in cooperation with Ministry of Transport, Post and Communication according to the Central Europe Initiative (CEI, Budapest March 31st 2000) established a national centre for Information Society support named: Information Society Promotion Office (ISPO). European Commission rapidly focused to the action of e-Europe and stopped with usage name ISPO since the year 2002. According to this change the new centre was renamed to e-Europe and has actualised content of its tasks. After them this centre was working as an electronic interactive support for information society development. (www.eeurope.sk – not functional actually). According to big changes on macro- and micro level from the year 2000 the institution named before was transformed to the Internet portal: Information Society (Informačná spoločnosť – IS)

The running national project Infovek (Info-age) (started in year 1999) was oriented to introduce computers and Internet to primary and secondary schools. It focused not only to establish technical and technology basis but also to develop the human sources for its usage.

The government of Slovak Republic has established a section research and evaluation state program about building information society for the period of 2002 - 2005 with perspective till the year 2010 on September 4th 2002 (resolution № 1007). The main aim of this state program is the realisation of strategy of society informatization and inserting the Slovak Republic into the European research area (ERA) for realisation of eEurope+ program.

For years 2002-2003 the tasks were oriented into following thematic fields:

- 1: Tools and methods for information society,
- 2: **Informatization of education,**
- 3: Management of knowledge and intelligent interfaces,
- 4: Digital state and regional administration,
- 5: Information and communication infrastructure and their components.

On the base of this resolution a document named „Návrh stratégie informatizácie spoločnosti v Slovenskej republike a akčného plánu,“ (Submission of Strategy of informatization society of Slovak Republic and action plan, on-line access on Internet address, was created during to following years.

[http://www.rokovania.sk/appl/material.nsf/0/2FE5A619ACE03805C1256E240033210E/\\$FILE/Zdroj.html](http://www.rokovania.sk/appl/material.nsf/0/2FE5A619ACE03805C1256E240033210E/$FILE/Zdroj.html)

This project (the elaborated report and documents) was presented by Ministry of Transport, Post and Communication and discussed on the session of the SR Government on 21st January 2004. The result is the Communiqué of the SR Government №43/21012004. The priorities and actual tasks of each ministry of Slovak Republic in the field of rapid informatization of Slovak society are defined in this document.

2. Strategy Plan

The basic aims of strategy plan for informatization of society in SR is oriented into four fields:

- Acceleration of building basis IS pillar
 - Standardization of creation and integration of useful content of information services for people and institutions,
 - Building human resources for IS primary in state and public administration and also in common sphere,
 - Conceptual and systematic building of infrastructure for access and connectivity.
- Stimulation of usage of Internet with creation and presenting relevant content on web sites
 - Acceleration of e-commerce,
 - On-line public administration: electronic access to public services,
 - On-line health services,
 - European digital content for global net,
 - Intelligent transport systems,
 - Life environment on-line,
 - On-line education.
- Investment into the human resources and into their qualification
- European youth in digital age,
- Provide for needed skills for digital services of information management systems and information processing system in public services,
- Access for all to the creation and profit of knowledge economy,
- Elaboration and realization of program for access to ICT for all on the base of the same opportunity with special aspects for specific groups of habitants (handicapped people, women after maternity leave, after 40 of age, etc..., seniors, gypsies, in country living people, minorities ...)
- Cheaper, faster and more safe Internet
- Support the implementation and connectivity of cheap access to Internet by high-speed link for all habitants,
- Creation an competitive environment for Internet services providers,
- Integration of information security into the IT transactions on all levels.

According to this strategy plan several special oriented subplans were elaborated. One of them is: The National Action Plan of the Slovak Republic Regarding the Decade of Roma Inclusion 2005 – 2015.

3. National Action Plan of the Slovak Republic Regarding the Decade of Roma Inclusion 2005 – 2015

This plan has been elaborated According to the point 3. part d) of Strategy Plan by working groups formed by priority area and by representatives of the Office of the Plenipotentiary of the Government of the Slovak Republic for Roma Communities, Ministry of Education, Ministry of Construction and Regional Development, Ministry of Labour, Social Affairs and Family, Ministry of Health, Statistical Office, NGOs and Roma Youth Forum.

Its objective is to extend and speed up the social inclusion of the Roma population including improvement of their social status by:

- defining a limited amount of quantitative objectives for the improvement of current status in priority areas and by establishing an indispensable information database in order to measure achievements of the defined objectives;
- elaborating and implementing national action plans in order to achieve the defined objectives;
- regularly reviewing the fulfilment of the objectives and, if necessary, by modifying the action plans during the Decade.

4. The Section of Information Society

The Section of Information Society (SoIS) was established at the Ministry of Transport, Post and Communication of the Slovak Republic on 1st May 2005 as the unit for filling function of building up the information society in the Slovak Republic. It expanded from the previous Department of Information Society that was delimited to Ministry of Transport, Post and Communication of the Slovak Republic from the Ministry of Education SR on 1st May 2004.

(<http://www.telecom.gov.sk/index/index.php?ids=13831&lang=en>).

The main of its task are in 3 fields:

- Field of international, interdepartmental and regional cooperation
- Field of project management
- Field of security and standards.

In the first field – in the field of **international, interdepartmental and regional cooperation** it elaborates the proposal of law and operational instruction in the field of information society (IS) - provides policy making and conceptual work of approximation to the European law in IS - evaluates the responsibilities of SR based on international agreement in the field of IS, in the cooperation with other ministries, central institutions of the state administration, other institutions of the state administration and autonomies – represents the SR in the steering committees for the community program IDA (e-Government, Observatory, e-

Procurement) – coordinates participation in community programs of EU in the field of IS and their subsequent implementation – coordinates the execution of resources from the structural funds, assigned to the building and development of IS for public sector – provides the outputs about the progress (Progress Report) in the field of the IS – coordinates the collection of information from the regions in connection with electronic services of the public administrations – develops the concept proposals for progress of the regional policy and program of its implementation – coordinates the interdepartmental collaboration with the electronic services of the public administrations – ensures coordinated execution of the EU structural funds by underdeveloped regions in the SR and their coordinated development in the field of IS – develops the concept in the field of electronic services provision – coordinates the making and operating process of the public administration portal.

In the field of **project management** SoIS provides activities related to the operation of the secretariat of the Government Council of the SR in Informatics, elaborates principles of the state information policy and participates on the preparation and realisation of tasks resulting from the approved documents – coordinates activities in software licensing for state and public administrations – participates in implementation of the ECDL (European Computer Driving Licence) – participates part in implementation and coordination of the Lisbon Strategy for the SR in the field of IS – develops the strategy for the process of IS in the SR conditions and action plan of its realisation – monitors fulfilment of actions plan of the strategy of IS and updates it – reviews projects made by institutions of the state administration, municipalities and other institutions of the public administration in the areas related with IS – coordinates the national projects in the field of building up the information systems and provides their management when necessary – develops concept of the development and realisation of the information systems of public administration in coordination with other institutions of the central governments.

In Field of **security and standards** SoIS prepares standards, methodologies and criteria of information security – cooperates in preparation of the legal rules in the process of IS forming in the field of information security – deals with collection, evolution and publishing of information about different aspects of the field of the security, and protection (statistic on the cyber crime, surveys, prognoses, etc.) – represents the SR in the Management Board of ENISA – ensures that the tasks in the field of creation, editing and publishing of the standards of the EU, publishing of public notices and methodical directives, expert cooperation with the institutions of the public administration and other subjects in the preparation of normative documents – coordinates building of information systems of the public administration (PA) especially in term of interoperability – draws up analysis related to background papers for subsystems of the information systems of the PA – finds, handles, stores and elaborates new information as a knowledge base for qualified building and development of information systems of the PA – prepares and coordinates intents for building of information systems of the PA on basis of common needs of different administrations – prepares and coordinates intents for building of information systems (InSy) of the PA for purposes of cooperation and coordination at the international level – draws up proposals of the strategic documents in the field of information security for InSy of the PA, monitors and analyses IT needs of PA and current state of InSy of the PA – participates on the content creation of InSy of the PA – represents the SR in the management committees for the community program of the EC Safer Internet Action Plan – coordinates activities related to software licences for the state and public administration.

Projects e-Europe and e-Europe+

The project e-Europe 2005 finished at the end of 2005 and was followed by the i2010 initiative.

The European Union's e-Europe Action Plan launched in Feira on 19/20 June 2000, aimed at bringing Europe closer to meeting the Lisbon objectives. At the European Council in June 2001, the then 13 Candidate Countries launched the e-Europe+ Action Plan, which mirrored that of e-Europe.

The final e-Europe+ Progress Report was presented in February 2004. It was based upon statistical information obtained from surveys carried out within the Candidate Countries during the 3rd quarter of 2003. Another round of surveys was undertaken in the 1st quarter of 2004 and covered Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic, and Slovenia.

Information Technologies and Public administration

State and public administration faces currently the growing demands for speed of provision of services for citizens and companies. In the environment of the growing economy the demands of the corporate sphere and those of citizens are going to grow and effective reaction of state and public administration is not just a requirement but a necessary precondition of further development of economy and society. It is necessary currently witnesses of growth of complexity of information systems and technologies and found the key tool for organizations to build more effective and more flexible information systems which shall enable better cooperation of institutions and departments.

In the transformation process several activities were realised. Many scientific conferences, symposiums, congresses were established and organised and many traditional activities were transformed under influence of changes. For example in 2006 an international congress: **ITAPA 2006** (Information Technologies and Public Administrations) was realised in capital of Slovakia. It was the fifth meeting of professionals and people interested in the field of information society, e-Government and knowledge-based economy.

ITAPA is the leading international congress on information technology use in public administration organized in Slovakia every year.

Modernization and information society development of public administration institutions is a big challenge. Too many interesting activities and projects, leading to higher efficiency of offices, or better contact with citizens, take place in Slovakia.

The ITAPA 2006 International Congress was organised in Bratislava on November 14 – November 15, 2006.

ITAPA Congress aims to help speeding up the information society development in public administration actively, mainly by:

- increasing demand for information society development in public administration,
- creates space where representatives of politics, public administration, academic field and commercial subjects meet and exchange their information,
- brings information on latest projects and foreign trends, provided right by foreign experts,
- allows presentation of various solutions using information technologies,
- awards and supports the best implemented projects that are introducing and using information technologies to public administration's processes.

ITAPA organisation has an Internet portal, which regularly informs about most interesting published e-Government news and press releases about eGovernment in Slovakia and abroad. It also gives information about official web-pages of relevant institutions and about interesting original Slovak and foreign recommended links, which ITAPA recommends people attention, if they are interesting in details about this topic.

From a reason that e-Government is an important priority of information society and information society creates a significant pillar of the knowledge economy, we offer you also published press information on Information Society and Knowledge Economy¹.

The 6th meeting of professionals and people interested in the field of information society, e-Government and knowledge-based economy was organised in November 2007. Patronage over the 6th year of the ITAPA International Congress has been taken by Mr. Robert Fico, Prime Minister of the Slovak Republic.

The congress was focused on:

- Increasing prestige of information technologies in the society
- Providing information on the latest projects, trends and experience in the field of information society development in public administration
- Awarding and supporting the best implemented IT projects in public administration
- Creating space for obtaining strategic contacts.

Patronage over the 7th year of the ITAPA International Congress organised in November 2008 has been taken by Mr. Ján Počiatek, Minister of Finance of Slovak Republic.

The ITAPA congress all time gives a real picture about the actual situation in Slovakia.

I. Living on-line

Living on-line is an actual feature of citizens in information society. ICT applications are already a natural component in many areas of life, which consequently undergo significant change. Many possibilities of today's life, which will help us in future, are already knocking at our door. The possibilities include on-line industry and entertainment, digital TV, media, shopping and digital services.

The government attention in Slovakia is focused into three areas:

- Innovation and competitiveness of economy
- Electronic services, e-Government and impact on the state economy
- Digital divide, digital literacy and human resources.

A research was organised to identify the needs and expectations of the citizens regarding public on-line services. The methodology, analysis of the collected statistical data and interpretation of the results were elaborated by **Institute for Public Affairs Bratislava (IVO) in collaboration with ITAPA**. The field data collection was carried out by a professional research agency Focus by employing a network of trained interviewers. The data collection was conducted throughout August 2007 on the sample of 1035 respondents. The research aims to elucidate the following:

- the level of the informed ness of the general population on the public on-line services; who is and who is not on-line;
- what is the user experience and satisfaction with the present state of on-line public services;
- what are the forms and means of using these services available to the citizens;

¹ More details on the web site: http://ec.europa.eu/information_society/europe/2005/doc/all_about/benchmarking/country_analysis.pdf

- what are the main benefits and barriers to their usage at present;
- what is the level of interest in using public on-line services and the public's potential for using these services into the future.

The result of research was presented at conference ITAPA in November 2007.

2. Better regulation and easier administration

European Commission recently introduced horizontal initiative under supervision of Gunter Verheugen called "Better regulation". Its goal is to reduce administrative burdens and bureaucracy, create more effective government services and improve European economy primarily through ICT usage. Slovakia acknowledged this initiative with its own strategy oriented to economic effects of electronic services on citizens, entrepreneurs and economy. By documents for Better law regulation in the EU and its influence on informatization was elaborated the Action Program for decreasing an administrative burden for entrepreneurship in Slovakia 2007 - 2012.

Better regulation is the key assumption for economic growth, competitiveness of companies and their potential to create new jobs. One of the main aspects of better regulation consists in reduction of administrative burden which the business entities must bear.

3. Action Program for decreasing an administrative burden for entrepreneurship in Slovakia 2007 - 2012

The European Council on the session in Brussels (8th – 9th March, 2007) introduced the Action Plan of the European Commission for Reducing Administrative Burdens (as an adequate tool of policy aimed at strengthening of competitiveness and support of sustainable growth and employment growth) in order to reduce administrative burden in the European Union till 2012 by 25 %. Concurrently, it invited member states to set their own ambitious national plans till 2008 and join the systematic effort concerning elimination of unjustified administrative costs which affect business entities.

On 3rd October, 2007 the Slovak Republic Government approved the material “Agenda of Better Regulation in the Slovak Republic and Action Programme of Reducing Administrative Burden of Entrepreneurship in the Slovak Republic 2007 – 2012“.

The Action Plan described in detail in the second part of the material shall

- institutionalize the model for management, coordination, and fulfilment of the agenda of better regulation and fulfilment of the Action Plan on the level of the Ministry of Economy of the Slovak Republic and the Deputy Chairman of the Slovak Republic Government - November 2007
- prepare the national methodology of measurement of administrative burden - November 2007
- create legislative basis (a list) which shall be quantified in term of administrative burden - January 2008
- implement basic measurement of administrative burden in the Slovak Republic according to individual central bodies of state administration - December 2008

- prepare the proposal of measures for securing further reduction of administrative burden and implementation of ex ante measurement within preparation of regulations on all levels of the public administration - 2009

4. Euro Changeover in the Government Services

In year 2008 EURO changeover has a high actuality. This current topic sounds also in the institutions of public administration. The Slovak government devoted a big attention to provide valuable advice and know-how for elimination of mistakes, as well as guidelines how to ensure the entire process. The main activities were oriented to:

- Set up of the Euro in Public Administration - Experience and suggestions
- Transition to Euro in the Public Administration
- Transition to Euro: Risks and recommendations regarding the adjustment of the information systems.

5. Global Trends and Policy Issues

The issue of intellectual property especially copyright becomes more important in the field of information technologies. An unauthorized use of author's works results in damage especially for authors of computer programmes and database generators. The topic of the presentation is the clarification of categorization of intellectual property rights with focus on the detailed specification of copyright, its sources and possibilities of protection. Since the computer program is also an author's work, its author is an owner of personal and property rights to it. Detailed information we can get at web site www.itpravo.sk.

In this field the main task is to find answers to everyday questions of those dealing with information and IT systems in public sector:

- Who is the author or the copyright owner?
- Those rights including the issue of rights to employee work?
- To who and for what we should pay?
- Who is entitled to exclusive rights?
- How to set up a contract and avoid unnecessary costs?
- How to set up contracts on work creation and licenses?
- What is the most frequent problems related to the creation and consideration of contracts?
- What is copyright, intellectual property, industrial property, re-usage of data and information?

We all need to know about intellectual property and I industrial law in Slovakia and also in Europe.

The first step on the way the solution in Slovakia is: Information system of Ministry of culture for intellectual property.

6. Electronic forms and electronic documents

The successful implementation of the e-forms in number of institutions has become an inspiration for many information systems in a state administration and in the self-government that are currently under preparation. E-forms also bring completely new possibilities that surpass original plans by far. The objectives in this are to share existing experience or "lessons learned" to those who are preparing usage of e-forms in their projects, to avoid mistakes or unnecessary steps and to show other applications and benefits of e-forms.

Modern solution for acquiring information is 602XML. XML Forms belong to modern office. XML forms serve for securing collection of quality data into the information system, for their publishing from the information system and for exchange of data among information systems.

Another possibilities are the Integration Platform in the system of public finances management and Electronic communication in Society.

The common life and roll of electronic and paper documents support us to found answer to several questions:

- What is the role of paper documents in digital administration?
- Are they capable of being a medium for digital signature?
- What is the relationship of paper and electronic documents and are they really secure?
- How to prepare trusty and legally acceptable documents from an electronic archive, how to print it remotely and safely and how to protect it from abuse and fraud?

For better management of office a new automation system was elaborated. This system solves the automation of the files management, intern processes and document circulation, names DMS KRAB (<http://www.itapa.sk/index.php?ID=4352>, 24.11.2008). : The DMS system was implemented as a part of a complex solution of modernization of information technologies of a customer, currently in use as well as new ones. Besides, systems of technology control, telemetric systems, economic system, service system, customer information system and lot more were applied.

The primary task was to apply a system for the administration of filing department, electronic circulation of documents, and securing electronic support of workflow processes as an addition of fundamental functionalities of other specialized systems in integrated, standard environment for users.

Main concerned works:

- Work of filing department administration pursuant to Act No. 395/22002 and the related Ordinance 628/2002
- Related work of Supplier contract registration
- Related work Internal regulations
- Work of receipt and registration of supplier invoices
- Related work of Approving supplier invoices
- Work of Receivable recovery
- Work of Meetings

- Work of Internal order forms
- Work of reception desk and gate house.

Individual works use common modules OCR, Full-text, workflow including specialized Work of Hierarchical tasks.

7. Safety of the electronic documents

Electronic documents live in a real practise in close connection with traditional world of paper documents. Their co-living brings everyday needs of mutual interconnection what often means the solution of complex questions. Many companies (for example ARDACO) intend to show on several examples how those tasks can be solved effectively. The place of paper and electronic documents in today's modern technologies is connected with problem of **Electronic signature on paper.**

The problem is usage of possibilities and advantages of electronic documents on paper documents. Unique technology is capable to store digital data directly on paper thus bridges the gap between the paper and electronic worlds. Paper documents gain properties that have until now been available only for electronic. By this method you can include metadata, apply digital security and encryption algorithms on paper documents or even to use electronic signature directly on paper

Full-value electronic communication in a company in the form of electronic forms, application of electronic signatures and automation of processes brings along lots of positive features. Their achievement at implementation is often accompanied by experiments and errors, expensive preparation and testing. It is useful to follow the way of achievable objectives and avoid known problems. Possible benefits resulting from electro-nization of communication and its automation is significant. The task in this field is how to avoid negatives accompanying its implementation.

Automate Processes

- Choose electronic forms technology
- Choose processes that are easily implemented
- Model business processes for workflows
- Deploy workflows and forms
- Deploy PKI technology
- Used for digital signatures
- Create user certificates
- Deploy Qualified Electronic Signature Technology
- Deploy Collaborative Portals Technology.

IV Information Systems and Portals

Effective solutions of many problems in several fields are an implemented information systems and portals, which expand the services of public administration for different groups of users as well as within the public administration itself.

A few of implemented information systems and portals in Slovak republic are:

- Information portal of Slovak Parliament
- Main Portal of Public Administration after one year of running,
- Payment portal of ÚPVV (Prognostic Institute of Universities)
- Grant system of Ministry of Culture
- Epidemiological information system
- SKPOS - Slovak space observing service for a GPS use
- Business registry of Slovakia
- Main portal of Ministry of Education

I. Electronic services

Building of electronic services of public administration means one of the declared priorities of development of information society in the Slovak Republic. The Slovak Republic, however, despite this declared priority, still occupies the last places in evaluation within the European Union.

Electronic services have an important role in information society. Specialists and sociology researchers search the following questions: Which year was finally a breakthrough in the introduction of e-services on Slovakia? What new did it bring? What is the experience? What needs to be arranged to eliminate existing barriers? How the customers and users appreciate these changes and what needs to be done to increase their number?

Which electronic services are useful, suitable and important for citizens?

All electronic information systems and portals offered several services for users.

2. Open technologies in public administration

The pleasure results of experiences, developments and activities on international, but also domestic level with Open Document Exchange Formats (ODEF) their usability in public administration. The practical examples of implemented technologies make certain of suitability of open technologies in public administration. In this field was elaborated and certificated standards and establishment of interfaces and formats.

Many of Slovak City Bureaus use an open source technologies in their information systems. With open source technologies very good experiences has the Municipal office - City of Banská Bystrica.

The IT department of the Municipal office - City of Banská Bystrica, has been interested in the open-source technology for years. They deployed many open-source based solutions for the office, both on server and client side of the infrastructure. They embrace the open standards, accordingly to the strategic documents of Slovak Republic and the EU, and following the legislative. Interesting solution is the open-source GIS of their Main Architect Unit.

The main advantages and possibilities of information systems and portals are:

- Benefits and advantages of good marketing of region, municipality, institution;
- Successful marketing strategy, incorporating the benefits of ICT and Internet;
- Content management, responsibility for provided information.

3. The City benchmarking - project

The goal of the pilot project of 12 cities is to produce a model which would be applicable in other cities in Slovakia as well. During the implementation the original intention, the benchmarking of the city bureaus, extended into benchmarking of the cities. The project is a product that offers an increase in efficiency of city self-rule functioning and will also offer an improvement of services.

Digital culture in information society

Protection of the cultural heritage, development of content and digital preservation technologies - these are the areas that the entire sphere of European culture lives by. Many projects and their authors are today looking for possibilities of the safe and long-lasting preservation of digital data. What is actually all about and how can you benefit from it.

Strategy of memory and fund institutions development and reconstruction of their national infrastructure are very important in this field. Memory and fund institutions are via their administered content the basis for development of the knowledge society. The state of funds in the Slovak Republic as well as securing their accessibility via ICT lacks far behind not only in the EU 15 average. The improvement of systems of acquisition and processing of the content of fund institution, its digitalization and making accessible is a key factor of provision of e-content for the development of inclusive information society.

I. Information systems in the culture sector of Slovakia

Interoperability as the ability of the system to communicate with other systems becomes one of the key issues in informatization and digitalization of cultural objects. In Slovakia its solution is being implemented via development of information systems, via observation of international standards and via creation of bases without authorities. The examples of the successful application of standards and creation of interoperable systems are for example CEMUZ (the Slovak National Museum), CEDVU (the Slovak National Gallery), library systems etc.

The main position in culture sector is the Information system of Ministry of culture. This IS orients to intellectual property issues in the globalized knowledge society, especially in the scope of improvement of the notion and knowledge of general public about this wide area regarding the creation of the IT system about intellectual property.

The significance of the IPR protection and need of continual improvement of information exchange on the line between the creators and right holders on one hand side and users (consumers) on the other is outlined on the theoretical background of IPR legislation in the process of harmonization. The system includes the special intellectual property database.

In the field of digital culture an important role have the possibilities of long-lasting storage and protection of digital data.

The approach and solution in the field of long-term preservation of digital content offered the company IBM. A standard solution for memory institutions for digital content archiving in the context of strategic activities of UNESCO and EC, especially in connection with the European Digital Library was elaborated. Referential solution of IBM company was realised in Slovak National Gallery.

2. Digital library

Digital libraries and their on-line catalogues give a dynamic access to the information. Digital on-line services of libraries are a necessity in modern information society. For on-line usage of books as information sources are their electronic forms. Many of Slovak popular libraries have at list on-line information and registration systems. For example: the Digital Library of the Slovak Library for the Blind in Levoča enables the blind to listen to the audio books from the library website (www.skn.sk, 11.11.2008). The books are protected from unauthorized copying by the DRM (Digital Right Management) system. Despite that the readers of the library may listen to them not only by means of computers but also via MP3 players or via mobile phones with the support of DRM system. The digital services of the library are popular also due to the fact that the blind decide about new books which will appear in the digital library via voting themselves.

It is automatic that the web registered office with such service fulfils the standards of accessibility for the blind as well as recommendations of W3C level AA.

The experiences from using a digital library at the Slovak Library for the Blind are very pleasure.

3. Safety of Internet and Information systems

Living on-line brings not only benefits, but also risks that need to be known of and prevented. As technologies evolve, so do develop the possibilities and also the offer of utilities and tools that protect our safety and mean higher quality, compared to current traditional status.

It is necessary to reveal what needs to be known for the "life on-line", what are the activities and what new technologies will be provided for public on-line services. This current topic sounds also in the institutions of public administration. Experiences exchange, valuable advice and know-how for elimination of mistakes, as well as guidelines how to ensure the entire process are very important.

The security and protection of information systems is very important and very often discussed topic on scientific conferences. This topic is also an actual problem for solving in research teams. The most effective method ensuring security of information system is biometric encryption. The access management basic features with a particular focus on the privacy and security advantages of biometric encryption that utilises biometric data of data subjects that are not stored anywhere - so they cannot be stolen and misused. Biometric encryption technology can help to overcome the prevailing "zero-sum" mentality, namely, that adding privacy to identification and information systems will necessarily weaken security and functionality. Biometric encryption technology promises a "positive-sum," win-win scenario for all stakeholders involved, in particular citizens having protected their personal data processed by E-Government, E-Health and other systems.

In many institutions the security and safety in information systems is solved in complexity. IBM and many other firms offer to institutions and a complex security system.

Security market overview

Security concerns

- Sabotage of business information systems
- Theft of information or IT assets
- Viruses causing productivity slowdowns
- Installation of unauthorized hardware and software
- System vulnerabilities, including unauthorized access
- Compliance Considerations
- Cost and legal exposure of non-compliance
- Poorly established compliance policies, processes and procedures
- Lack of effective policy monitoring and compliance reporting

Informatization in education

I. Project Infovek

Project **Infovek** is a typical project based on initiative of bottom-up development. It was started in year 1999 by its presentation on the conference with the same name on January 14th 1999. In the same year a few days ago was established a public association with a little collective of four people (Katarína Mandíková, Tíbor Papp, Martin Hauptvogel and Peter Sýkora). On the conference there was a very intensive discussion between the number of government representatives and experts in this field from universities, firms and public institutions.

The text of project includes the main principles expressed in 7 points:

- 1.The hardware infrastructure must be built in all schools (in cities and villages, in state, private and also in special schools).
- 2.The used hardware must have a high quality on actual level of used tools.
- 3.The schools must have not only connection to the Internet, but have also a multimedia computer classroom for using its services.
- 4.The number of participant schools on the project must be the maximum.
- 5.The management of the project have to be professionally and institutionalised.
- 6.Have to be integrated several financial sources (state, extra, international etc.).
- 7.The preparation of teacher must have a systematic character and must include the basic skills, how to implement ICT in teaching her/his subject.

Realisation the aims of project in the beginning of its elaboration was controlled officially by the president of National Council of SR Jozef Migaš. The conference Infovek was followed with a brainstorming meeting on 23. 02. 1999 of ministry of education (Milan Ftáčník), specialists from universities and from ICT firms. To the small group were connected a few new personalities (Beata Brestenská and her students from Department of Didactic of Natural Sciences, Psychology and Pedagogy of Faculty of Natural Sciences of Comenius University in Bratislava. The group was supported also by Ivan Kalaš and his student Roman Baranovič from the Department of Informatics Teaching from the same university. The Infovek initiative was supported also by Katarína Pišútová from OSF (Open Society Fund).

According of ask of ministry of education very details the actually steps were elaborated. The tasks were divided into two stages.

The short review of history of Infovek development:

Year 1999

- 20 million Sk as support for informatization of schools.
- Creations of section of Infovek at the Institute of Information and Prognostic of Education.
- 80 schools was selected by Ministry of Education SR for the experiment.
- Provider for hardware and Internet services was selected.
- The project Infovek started its own website www.infovek.sk on own server.
- In December 1999 the hardware infrastructure of 79 schools was finished.

The Development of project Infovek shows the next table:

	mil. Sk	PC	Školy	%
1999	20	425	79	2.3
2000	80	817	229	6.9
2001	210	2000	479	14.5
2002-3	2 000	33 000	3300	100

Notice: „Školy“ means „ number of schools“

Year 2000

- Realisation of summer school Infovek for teachers (120 teachers was prepared for using computer, Internet and ICT in education.)
- The government supported with 35 mill. Sk (received from privatisation and lottery) the realisation of project Infovek.
- Realisation of the conference Infovek 2000 for teachers (at which have participated more than 200 teachers).
- Next 150 schools was selected for connection to the Infovek project.
- The provider of Internet services and hardware was selected.
- The financial support was increased to 210 million Sk for year 2000.

That means that according the table to the end of the year 2003 the infrastructure was finished in all schools. A big help in this process was a gift of Slovak Telekom for all schools in a form of a local network, which contains 6 computers with 1 server with an access to the Internet.

After finishing the building infrastructure and creation of multimedia rooms with Internet access it is important to thing about their effective usage not only for pupils, students and teachers but also for public. Internet access in villages has a big importance in life-long education, requalification and for the life in information society.

The opening of a dense net of Internet-multimedial classes at the schools plugged into the Infovek will open a huge space for the realisation of the principles of a citizen society to the own local community. But not only through enabling an operational application of the law about a free access to information but also gives to citizens an extraordinary efficient tool for control of state and public administration on the own hand, and owning the Internet communicating a flexible dialog of state representatives and public administration with

their citizens in a unprecedented range on the other side. It is possible also contemplate about a referendum or different form vote taking with the tools of Internet and use the Infovek-net. The realisation of ideas of democratic society with the aid of the project Infovek and “Digital Štúrovstvo” gives in such way a fully new dimension for all member of society.

2. Project MILENIUM

The Slovak government devotes a big attention to the education, and to the preparation of new youth generation and all people for living in information society. As an action plan in the field of education (including all levels: elementary schools, secondary schools and universities) the MILENIUM project was elaborated.

As a result of project MILENIUM the curricula transformation was realised at primary and secondary schools. (Appendix 1)

A next result of project MILENIUM several re-qualification and additional courses were organised for primary and secondary schools teachers.

The courses were oriented to implementation the ICT to the school praxis.

In month November 2007 **Microsoft – Slovakia** presented its project at conference **Science and Technology at Universities** which was held at the Constantine The Philosopher University in Nitra. The project contains a free package of Internet services for all Slovak university students as a present to international student day (November 17th).

The conference was organised by Slovak Ministry of Education during Week of Science in Slovakia in 2007.

New challenges of information society and needs of people to evocate changes in education at all level of them. The results of this needs was the curricula transformation of elementary and secondary schools and also implementation new subjects and new methods and technologies to the education. The new tools introduced to the educational process have a dominant feature “electronic”: e-learning, e-teaching, e-education etc. and it is get not only in education institution but also by a new way and form as a life long learning. At schools are computers, Internet, LMS used as an universal didactic tool.

At Slovak schools and universities the common used LMS is Moodle. (In Czech Republic at universities the WebCT is preferred).

More detailed information about curricula transformation at elementary and secondary schools and its results is in Appendix 1. Appendix 2 contains the selected universities and educational institutions which use LMS Moodle.

Results, statistics, numbers

The results of these benchmarking and monitoring surveys for the SR are in following table²:

SLOVAK REPUBLIC	Some basic indicators about Internet usage in a comparative perspective			
		CEE 10 lowest	CEE 10 average	CEE 10 highest
1. Population (in millions, 2004)	5.4	1.4 (EE)		38.2 (PL)
2. GDP in Purchasing Power Parity per capita (as percentage of EU 15, 2003)	49	26 (BG, RO)		76(SI)
3. Fixed telephony household penetration, December 2001 (IBM 2003A)	69.5	49.9 (RO)		85.3 (SI)
4. Fixed telephony household penetration, June 2003 (IBM 2003B)	58.2	50.2 (LT)		96.2(SI)
5. Percentage of households with a PC (Dec. 2003, eEurope+)	45.7	16.7 (BG)	32.6	64.3(SI)
6. Internet usage 2001, ITU	12.5	4.5 (RO)	10.1	30 (EE, SI)
7. Internet usage, at least once a week (Dec. 2003, eEurope+)	26.8	12.7 (RO)	20.5	42.0 (EE)
8. Number of computers in secondary education per 100 students connected to Internet (December 2003, eEurope+)	3.5	2.1 (LT)		10.7 (HU)
9. Percentage of GPs with Internet access in the consulting room (December 2003, eEurope+)	18.3	12.3 (LV)	23	92 (EE)
10. Percentage of population using the Internet for interacting with public authorities (send in filled in forms)(Dec. 2003, eEurope+)	1.9	0.5 (LT)	2.3	14.4 (EE)
11. Percentage of population that has bought online (Dec. 2003, eEurope+)	3.5	0.8 (LT)	3.4	12.3 (CZ)
12. Percentage of population that has bought online (TNS 2002)(BG, RO, HU and LV not included)	2.	1 (PL, LT)		3 (EE)
13. Percentage of population that used e-banking (Dec. 2003, eEurope+)	8.2	0.2 (BG)	4.0	40.1 (EE)
14. Percentage of enterprises that purchased online (December 2003, eEurope+)	15.1	4.4 (BG)	14.9	29.8 (CZ)

)

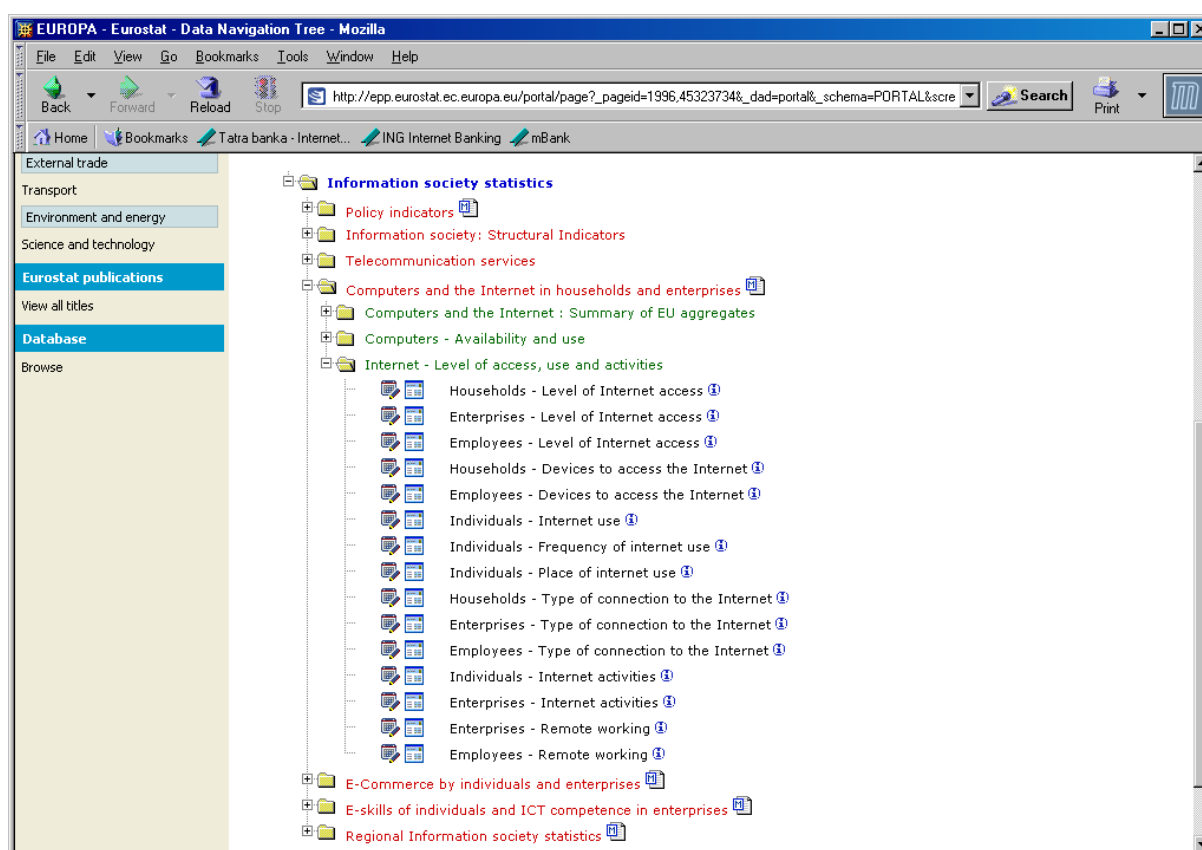
² More details on the web side: http://ec.europa.eu/information_society/eeurope/2005/doc/all_about/benchmarking/country_analysis.pdf

On the web portal Eurostat (European statistics) one can find several actual statistic dates:

http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1996,45323734&_dad=portal&_schema=PORTAL&_screen=welcomeref&open=/&product=EU_MASTER_information_society&depth=2 (05.12.2008)

On the following picture we can see by the navigation tree rich possibilities of this information system. Using information system EUROSTAT it is possible to get several actual information in interactive way by selection offered alternatives.

For example in the next print screen picture are the percentage of households with the access to Internet at home in Bratislava region at Slovakia. 62 % home access to Internet is enough high number in this field. The statistical dates by states and regions it is possible to get by selection Regional information society statistics.



Percentage of households with access to the Internet at home

Date of extraction: Sun, 7 Dec 08 10:53:26
Last update: Tue Dec 02 09:20:01 MET 2008

indic_is_h_iacc Percentage of households having access to the Internet at home
unit pc_hh Percentage of households

time	2008a00
geo	
sá07 Bratislavský kraj	62

The percentage of households with the access to Internet at home in Bratislava region at Slovakia: 62 %

I. Short information from different sources

10.01.2007 Source: Slovak Spectator

IT investments exceeded \$1 billion in 2006 (Slovak Spectator – January 10, 2007) An analysis carried out by IDC, an international IT market research company, reports that investments in information technologies (IT) exceeded \$1 billion in Slovakia in 2006, an 11 percent increase from the \$980 million recorded in 2005.

31.01.2007 Source: SITA

About 50,000 People in Slovakia Use Fast Mobile Internet Access (SITA – January 31, 2007) About 50,000 clients of the two mobile operators active in Slovakia used Internet mobile access via broadband technologies at the end of 2006. "According to our estimates, about 30,000 clients of T-Mobile used high-speed access to the Internet. Approximately 20,000 people used our services," Orange Slovensko director for strategy Ivan Marták said at a conference Telekomunikácie SR 2007 on Wednesday.

01.02.2007 Source: SITA

Telefonica O2 Slovakia Clients Can Make Calls from Friday Midnight (SITA – February 1, 2007) The third mobile operator in Slovakia, Telefonica O2 Slovakia, has launched operations on Friday, February 2, soon after midnight.

06.02.2007 Source: Slovak Spectator

Mobile penetration exceeds 100 percent in Slovakia (Slovak Spectator – February 6, 2007) The number of mobile phone SIM cards exceeded the number of Slovak inhabitants at the end of last year, according to Orange Slovensko mobile operator boss Pavol Lančarič. According to figures from Orange, the two incumbent operators (including T-Mobile Slovensko) had around 5.2 million clients in around 400,000 pre-registered clients.

Recommendations for future research

The actual statistic results show that the usage of Internet services: e-banking, e-commerce, e-mail etc. have increasing tendencies. The infrastructure is prepared and it is no problem to change it - update it rapidly in a short time. To organise different courses for citizens is no problem, but change the thinking of citizens is a long time process. A possibility to use several e-services is an actual feature of information society. The technology background of those possibilities is one side of society informatization process, use them voluntary and without afraid about safety of them is the other side of it. To found out the solution of this problem is a complicated task for education institutions. In the field of using e-services by older citizens play an important role the support and help of younger numbers of their families. In this field is a paradox paradigm change, when their experiences give young people to old people. In this field the help of children to parents and grandparents is a natural process for increasing digital literacy of seniors.

In the field of education is no problem to create suitable infrastructure for using computer and internet services in educational process, also is no problem to organise several courses for teachers how to use and create internet e-learning courses. To take part in this courses is without problem, but real introducing of the e-learning, computer and Internet supported teaching into schools and applied them effectively is a hard task for teachers. The educators need also introduced to the schools new more effective methods and have modern technical environment, didactic tools and good course-wares.

We recommend the future research oriented to the:

- Effects of Internet services
- Relationships of citizens to e-services
- Effects of e-learning and computer aided teaching in education
- Quality and effects of e-learning courses

Information sources

URL1:[http://www.rokovania.sk/appl/material.nsf/0/2FE5A619ACE03805C1256E240033210E/\\$FILE/Zdroj.html](http://www.rokovania.sk/appl/material.nsf/0/2FE5A619ACE03805C1256E240033210E/$FILE/Zdroj.html) (10.11.2007)

URL: <http://www.telecom.gov.sk/index/index.php?ids=13831&lang=en> (10.11.2007)

URL3:http://ec.europa.eu/information_society/eeurope/2005/doc/all_about/benchmarking/country_analysis.pdf (16.11.2007)

URL4: <http://www.itapa.sk/index.php?ID=4352> (24.11.2008).

URL5:www.skn.sk (11.11.2008)

URL6:http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1996,45323734&_dad=portal&_schema=PORTAL&screen=welcomeref&open=/&product=EU_MASTER_information_society&depth=2 (05.12.2008)

Projekt Infovek Slovensko, Učiteľské noviny, str. 14, 1999 (8. apríl)

Sýkora, P., Brestenská, B., Kalaš, I., Mandíková, K., Pišútová, K., Baranovič, R., Papp, T.: Projekt Infovek Slovensko: Návrh realizácie prvej fázy pilotnej etapy (august 1999 - december 1999). Asociácia Projektu Infovek, Bratislava, 1999, str. 12-31.

http://www.statpedu.sk/buxus/docs//Pedagogicke_dokumenty/zakladne_skoly/osnovy/Informatika_2st_uo.pdf (12.07. 2008)

http://www.statpedu.sk/buxus/docs//Pedagogicke_dokumenty/zakladne_skoly/ucebne_plany/up_zs_inf.pdf (12.07. 2008)

Appendix I

I. Informatics and Informatics education courses in the elementary schools

Programme of Informatics education course on 1st level of elementary schools and Informatics course for 2nd level of elementary school was registered under the number CD-2007-10761/30121-3:091 with date of validity, since 1st September 2007.

CURRICULA of Informatics literacy course for 1.-4. classes of elementary schools

Lessons per week: 1 hour

Total during the school-year: 33 hours

Obligatory subjects:

1st 2nd 3th 4th class

Slovak language and literature	9	8	9	9
Sciences	1	2	-	-
Country knowledge	-	-	1	2
Natural history/physics	-	-	2	1
Mathematics	4	5	4	5
Informatics education	1	1	1	1
Work-education	-	-	1	1
Fine arts education	2	2	2	2
Music education	1	1	1	1
Physical education	3	3	3	3
Religion/ Ethics	1	1	1	1
Summary	22	23	25	26
Voluntary subjects	1-2	1-2	1-2	1-2

Content

1st class

Purposes:

- acquainted with computer, mouse, keyboard, pen, handling an easy games
- acquainted with elementary graph editor environments and tools
- be able to draw and edit picture
- be able to draw and write fonts
- acquainted with search/finder programs – be able to run some games, to play some music
- work in some basic program language (micro-worlds)
- preparing and presenting basic projects.

Subjects/themes/ topics:

- work in children computer programs
- graphic art working
- Internet working
- basic programs
- games
- recapitulation.

2nd class

Purposes:

- recapitulation and make enlarge knowledge from 1st class
- acquainted with environment of a basic text editor
- be able to write and edit text, complete text with picture or illustration
- save, open and create new document
- get knowledge in algorithmic and logical thinking
- receive and send e-mail, SMS
- be able to find information and read it on the Internet (search, browse), write address and click to mail
- be able to run game from Internet or CD driver
- preparing and presenting basic projects.

Subjects/themes/topics:

- work in children computer programs
- graphic art working
- text working
- working with Internet browser and with e-mail

- games
- recapitulation.

3rd class

Purposes/Intentions:

- developing algorithmic thinking
- acquainted work with text, clipArt, wordArt, edit text by special effects and colours
- be able to write and edit text, complete text with picture or illustration
- using geometrical forms
- get knowledge in algorithmic and logical thinking
- drawing with use the tools of graphic editor, cut and paste, using effects
- drawing by sketch/scheme
- using Internet, e-mail
- be able to put in and put out CD driver and play/run it in computer
- working with multimedia (music, video)
- working on projects.

Subjects/themes/topics:

- work in children programs
- text working
- graphic art working
- working with Internet browser
- working with CD, educational software
- games
- recapitulation.

4th class

Purposes/Intentions:

- confirming knowledge at conditions in programs part, be able to create basic procedure in program
- acquainted work in text and graphic art editor
- acquainted with environment and tools of the presentational software (PowerPoint)
- searching information
- acquainted with operation system environment
- be able to work with folders
- working on projects.

Subjects/themes/topics:

- work in children programs
- working with text, graphic art, presentation
- working with Internet browser
- working in the graphic art user environment, networking
- games
- recapitulation.

Programme of Informatics education course C coordinator: RNDr. Viera Blahová, Ministry of Education, SR

Autors: RNDr. Andrej Blaho, ŠPÚ, RNDr. Viera Blahová, MŠ SR, RNDr., Zuzana Kubincová, KZVI FMFI UK, RNDr. Michal Winczer, KZVI FMFI UK [1]

2. PROGRAMME OF INFORMATICS COURSE FOR 5th-9th CLASSES OF ELEMENTARY SCHOOLS

Lessons per week: 2 hours

Total during the school-year: 66 hours

Obligatory subjects:

5th 6th 7th 8th 9th class

Slovak language and literature	5	4	5	4	5
Foreign/alien language	3	2	2	2	2
History	1	2	2	2	2
Geography	2	2	2	2	1
Civil education	-	1	1	1	1
Mathematics	5	5	5	4	5
Physics	-	2	2	2	<input type="checkbox"/>
Chemistry	-	-	-	2	5
Natural history/Biology	2	2	2	2	<input type="checkbox"/>
Informatics	2	2	2	2	2

Technical education	1 1 1 1 1
Fine arts education	1 1 1 1 1
Music education	1 1 1 1 1
Physical education	2 2 2 2 2
Religion/ Ethics	1 1 1 1 1
Summary	26 28 29 29 29
Voluntary subjects	1-2 1-2 1-2 1-2 1-2

Purposes of the teaching modules

1. Algorithms and programming

Purposes/Intentions:

Make oneself master of elementary algorithmic thinking, get skills and knowledge in elementary notions of programming; command, procedure, cycle, parameters, working in suitable program environment take into consideration of pupil age (Logo, Imagine, Karel, Baltík, children version of Pascal program)

2. Internet

Purposes/Intentions:

- get acquainted with many-sided of information and pages (traffic, travel, weather, business, educations)
- be able to use IKT for finding far information, be able to communication with other pupils and teachers, using IKT for oneself education
- be able to work with class-mates, experts and others by use IKT for school-experiments, themes and information, be able to present these solutions
- risks of safety work on Internet and e-mails (Spam, virus), netiquet.

3. Work with text

Purposes/Intentions:

Get acquainted with elementary tools of creating and editing text documents, be able to display writing up text document by tools of editor.

4. Work with tables

Purposes/Intentions:

Get acquainted with elementary tools of tables working, be able to display creating and edit documents with tables items.

5. Prepare graphic information

Purposes/Intentions:

Get acquainted with elementary tools of working with graphic information, given elementary knowledge and skills about graphic information, be able to use graphic items in the presentations of school-works in different subjects, be able to demonstrate processes by animations (Physics, Biology...).

6. Information presentation

Purposes/Intentions:

Get acquainted with elementary tools of presentations creating, be able to plan, develop, publication and present projects by IKT accessories in front of class, be able to use IKT tools for creating presentations in the group work.

7. Information around us

Purposes/Intentions:

Be able to collect information and be prepared for communication to other partners by IKT – with teachers, family or class-mates, understanding to representation information in the computer by zero and one (in texts, pictures, numbers), be able to arrange/organize information in the computer.

8. Information Society

Purposes/Intentions:

Be able to demonstrate positive social and ethics behaviours by using IKT, be able to discuss about daily IKT using in the every days life – about it advantages and disadvantages, be able to discuss about elementary topics of IKT safety and information safety. Be to comment oneself experiences with IKT in daily life and make exchange of these experiences in the class.

9. Multimedia

Purposes/Intentions:

Learn to use multimedia sources taking into consideration of pupils age for aiding of learning process. Be able to create documents with multimedia items by teacher, family or class-mates help.

10. Computer and program systems

Purposes/Intentions:

Make oneself master of elementary knowledge about notions: software, hardware, computer, peripherals, be able to handle computer and its input /output instruments, get acquainted with notion: operation system, understanding these mission.

11. Robotics

Purposes/Intentions:

Get acquainted with some robotic constructions, be able to store a model and direct it by software, make oneself master of elementary knowledge about models programming.

12. IKT in other subjects

Purposes/Intentions:

Be able to use content-specific tools, software's and simulations for aiding learn-process and researches, be able to use multimedia tools and peripherals for aiding oneself and group working in differ subjects, be able to select tools and technologies in the solution of differ experiences and school-experiments from different areas/domains.

Programme of Informatics course C coordinator: RNDr. Viera Blahová, Ministry of education, SR

Autors: RNDr. Andrej Blaho, ŠPÚ, RNDr. Viera Blahová, MŠ SR, Mgr. Ľuboš Košút, ZŠ a G Košická, Bratislava, Mgr. Peter Kučera, 1. SG Bajkalská, Bratislava, RNDr. Eva Šestáková, ZŠ Lazaretská, Bratislava

3. Programme of Informatics and Informatics education course for 3th-9th classes of elementary schools with Foreign language dotations

Lessons per week: 1 hour

Total during the school-year: 33 hours

Obligatory subjects:

3th 4th 5th 6th 7th 8th 9th class

Slovak language and literature	9	9	5	4	5	4	5				
Alien/ Foreign language 1			2	2	-	-	5	4	4	4	4
Alien/ Foreign language 2			-	-	□□	□□	□	□□	□□	□□	
Country knowledge			1	2	-	-	-	-	-	-	

Natural history	2	2	-	-	-	-	-	-
History	-	-	1	2	2	2	2	2
Geography	-	-	2	2	2	2	2	1
Civil education	-	-	-	1	1	1	1	1
Mathematics	5	5	5	5	5	4	5	
Physics	-	-	-	2	2	2	2	□
Chemistry	-	-	-	-	2	5		
Natural history/Biology	-	-	2	2	2	2	2	□
Informatics	-	-	1	1	1	1	1	1
Information education	1	1	-	-	-	-	-	-
Work education	1	1	-	-	-	-	-	-
Technical education	-	-	1	1	1	1	1	1
Fine arts education	1	1	1	1	1	1	1	1
Music education	1	1	1	1	1	1	1	1
Physical education	2	2	2	2	2	2	2	2
Religion/ Ethics	1	1	1	1	1	1	1	1
S u m a r y	26	27	27	29	30	30	30	

Non obligatory subjects 1-2 1-2 1-2 1-2 1-2 1-2 1-2

Programme of Informatics course C coordinator: RNDr. Andrej Blaho, ŠPÚ

Autors: RNDr. Andrej Blaho, ŠPÚ, RNDr. Viera Blahová, MŠ SR, Mgr. Ľuboš Košút, ZŠ a G Košická, Bratislava, Mgr. Peter Kučera, 1. SG Bajkalská, Bratislava, RNDr. Eva Šestáková, ZŠ Lazaretská, Bratislava [2]

Links to used materials :

[1][http://www.statpedu.sk/buxus/docs//Pedagogicke dokumenty/zakladne skoly/osnovy/Informatika 2s t_uo.pdf](http://www.statpedu.sk/buxus/docs//Pedagogicke_dokumenty/zakladne_skoly/osnovy/Informatika_2s_t_uo.pdf) /?.07. 2008/

[2][http://www.statpedu.sk/buxus/docs//Pedagogicke dokumenty/zakladne skoly/ucebne plany/up_zs in f.pdf](http://www.statpedu.sk/buxus/docs//Pedagogicke_dokumenty/zakladne_skoly/ucebne_plany/up_zs_in_f.pdf) /?.07. 2008/

Appendix 2

I. List of selected universities, secondary schools and institutions which use LMS Moodle

Slovak Republic

Ekonomická univerzita v Bratislave

<http://moodle.euba.sk/>

Ekonomická univerzita v Bratislave, Fakulta hospodárskej informatiky

<http://os.euba.sk/~moodle/>

Katolícka univerzita v Ružomberku, Filozofická fakulta

<http://elearning.ku.sk/moodle/>

Katolícka univerzita v Ružomberku, Pedagogická fakulta

<http://elearning.ku.sk/moodle/>

Prešovská univerzita, Pedagogická fakulta

<http://moodle-pf.unipo.sk/>

Slovenská poľnohospodárska univerzita v Nitre, Fakulta ekonomiky a manažmentu

<http://www.fem.uniag.sk/moodle/>

Slovenská technická univerzita v Bratislave, Fakulta elektrotechniky a informatiky

<http://elearn.elf.stuba.sk/moodle/>

Slovenská technická univerzita v Bratislave, Fakulta chemickej a potravinárskej technológie

<http://www.kirp.chtf.stuba.sk/moodle/>

Slovenská technická univerzita v Bratislave, Katedra matematiky a deskriptívnej geometrie

<http://www.math.sk/moodle/>

Slovenská technická univerzita, Fakulta elektrotechniky a informatiky, Katedra mikroelektroniky

<http://ec.elf.stuba.sk/moodle/>

Technická univerzita Košice, Ekonomická fakulta

<http://www2.ekf.tuke.sk/moodle/>

Technická univerzita v Košiciach

<http://moodle.weby.cnl.tuke.sk/>

Trenčianska univerzita Alexandra Dubčeka v Trenčíne

<http://www.infosys.tnuni.sk/moodle/>

Univerzita Komenského v Bratislave, Fakulta managementu

<http://www.moodle.mins.sk/>

Univerzita Komenského v Bratislave, Fakulta matematiky, fyziky a informatiky, Katedra základov a vyučovania inomatiky a Katedra aplikovanej informatiky

<http://cpr.ii.fmph.uniba.sk/moodle/>

Univerzita Komenského v Bratislave, Fakulta matematiky, fyziky a informatiky, Katedra fyziky

<http://fyzikus.fmph.uniba.sk/moodle/>

Univerzita Komenského v Bratislave, Filozofická fakulta

<http://negro.fphil.uniba.sk/moodle/>

Univerzita Komenského v Bratislave, Prírodovedecká fakulta, Výskumno-edukačné centrum informačných technológií

<http://moodle.vecit.sk/>

Univerzita Komenského v Bratislave, Rímskokatolícka cyrilometodská bohoslovecká fakulta

<http://www.frcth.uniba.sk/moodle/>

Univerzita Komenského v Bratislave

<http://e-learn.uniba.sk/moodle/>

Univerzita Konštantína filozofa v Nitre

<http://www.edu.ukf.sk/>

Univerzita Konštantína filozofa v Nitre, Katedra informatiky

<http://divai.ukf.sk/moodle/>

Univerzita Mateja Bela Banská Bystrica, Pedagogická fakulta

<http://www.pdf.umb.sk/moodle/>

Univerzita Mateja Bela v Banskej Bystrici, Virtuálna katedra informatiky

<http://virtual.fpv.umb.sk/moodle/>

Žilinská univerzita

<https://vzdelavanie.utc.sk/moodle/>

Secondary schools in Slovak Republic

Gymnázium Bilíkova v Bratislave

<http://moodle.gymbilba.sk/>

Gymnázium Fiľakova

<http://nh569000.plexus.mediahost.sk/moodle16/>

Gymnázium pavla Horova v Michalovciach

<http://elearning.gphmi.sk/moodle/>

Gymnázium Sobrance

<http://moodle.webconsult.sk/>

Stredná priemyselná škola elektrotechnická v Prešove

<http://linux.spse-po.sk/moodle/>

Stredná priemyselná škola v Poprade

<http://moodle.spspp.sk/>

Spojená škola Brezno

<http://moodle.zelpo.sk/moodle/>

Universities in Czech Republic (in Czech Republic LMS: WebCT is preferred)

Česká zemědělská univerzita v Praze

<https://moodle.czu.cz/>

Slezská univerzita v Opavě, Obchodně-podnikatelská fakulta v Karviné

<http://moodle.opf.slu.cz/>

<http://elearning.opf.slu.cz/>

Ekonomické fakulty Vysoké školy báňské - Technické univerzity v Ostravě

<http://moodle.vsb.cz/moodle/>

Masarykova univerzita v Brně, Filozofická fakulta

<http://www.phil.muni.cz/elf/>

Univerzita Komenského v Prahe

<http://dl.cuni.cz/cuni/>

Univerzita Komenského v Prahe, Přírodovědecká fakulta, Katedře organické a jaderné chemie

<http://moodle.orgchem.cz/>

Other institutions

Centrum vzdelávania neziskových organizácií
<http://www.cvno.sk/moodle/>