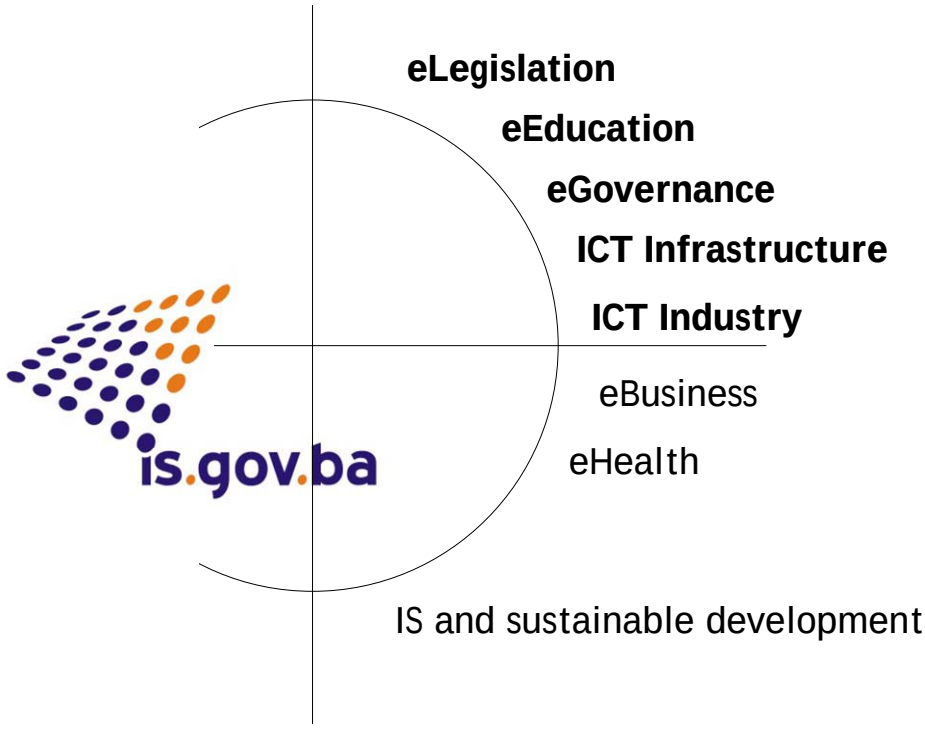
Council of Ministers of Bosnia and Herzegovina
Vijeće Ministara Bosne i Hercegovine
Савјет Министара Босне и Херцеговине

Action Plan of Information Society Development in Bosnia and Herzegovina



Council of Ministers of Bosnia and Herzegovina

United Nations Development Program in BiH

Project: Strategy of Information Society Development in Bosnia and Herzegovina

Full document title:

Action Plan of Information Society Development in Bosnia and Herzegovina

Purpose of the document:

Action Plan of Information Society Development in BIH is a document that provides specification of concrete actions for development of information society in Bosnia and Herzegovina, for the period 2004-2010. The action plan is based on strategic guidelines defined in the Strategy of Information Society Development in BIH.

Strategy is related to these five development pillars:

- eLegislation
- eEducation
- eGovernance
- ICT Infrastructure
- ICT Industry

Document references:	Action Plan of IS Development in BIH 2004-2010.
Status:	Final
Version:	5.1
Date:	5.8.2004
Owner:	Council of Ministers of BIH

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ABOUT THE DOCUMENT

Bosnia and Herzegovina should not stay out-of-the-way and isolated from current globalization trends including development of modern information society based on knowledge and information and usage of information and communication technologies in every day life.

Furthermore, processes of informatization and such transformative changes should not happen haphazardly. By using experiences from other countries these processes are to be promptly directed and developed.

In cohesion with aforesaid the Council of Ministers of Bosnia and Herzegovina has laid a foundation to the process of designing Policy and Strategy for development of the information society in BIH as a blueprint for development of the information society in BIH.

Policy for development of the information society will serve, in the process of growth and building information society, as a comprehensive and fundamental document for imposing laws, regulations and other acts, defining developmental trends, action plans and priorities on BIH level and its entities.

Policy also defines preparation of strategies for development of informatiom society in different developmental sectors (ICT Infrastructure, ICT industry, eBusiness, eEducation, eHealth, eGovernance, legal infrastructure and informatiom society and susteinable development.)

Strategy for Development of Information Society defines five developmental pillars:

- Legal infrastructure
- eEducation
- eGovernance
- ICT Infrastructure
- ICT Industry

The Strategy offers guidelines for the actions to be taken. However, it ought not to be a "dead letter". The Strategy should be accompanied by the corresponding Action Plan for the development of information society.

This document contains the Action Plan for the development of information society in Bosnia and Herzegovina.

The Action Plan offers the platform for Strategy enforcement. The Document defines programs, projects and initiatives regarded as particularly important for the development of the information society to be supported by the Council of Ministers and entities' Governments. They are in line with strategic guidelines identified in the Strategy and consequently with overall principles, recommendations and course of the development delineated in the Policy for Development of Information Society.

The focus has always been on developmental activities, that directly initiate overall systematic development of information society in accordance with the Strategy.

Each activity has been specified through draft terms of reference, but with a varying level of complexity .

- Strategic multidisciplinary programes of vital importance for development of information society, established on state level ;
- Developmental programs placed with the aim to foster reinforcement and development of a specific ICT sector (education, infrastructure etc.);

- Developmental projects aimed at realization of specific/targeted objective or products. These should be of greater importance for informatization of society (electronic ID card, media digitalization etc.);
- Pilot projects aimed at implementation of the specific solutions, while the premise to accept these solutions through an evolutionary approach (experimental introduction of eEducation etc.);

Timeframe and priorities have been determined and activities prioritized while in a a broader context all activities are considered as a main concern.

Stakeholders and participants have been identified in the outlined scope of work. Government institutions are not necessarily the main stakeholders. The Action Plan has not been limited to a group of activities through which the Government will implement and encourage development of information society, on the contrary, this document corresponds to an activity plan for development of information society in Bosnia and Herzegovina through the action of all public entities (Government, public companies, private sector, public institutions, donors, non-governmental institutions, international community and every citizen).

Besides the activity specification, benchmarking system for tracking the progress of information society has been designed through the package of indicators.

The following constituents have been defined for each indicator:

- Description of indicator
- Importance of indicator
- Data source for indicator construction
- Method and frequency of data collected
- Estimates of weight factor, validity and accessibility of indicator

Strategy for Development of Information Society tackles the time-frame from 2004 – 2010

Ordering party is the Council of Ministers of Bosnia and Herzegovina

The Document has been prepared in cooperation with the United Nations Development Programme (UNDP) in Bosnia and Herzegovina

Short Overview of Action Plan and Progress Indicators

1. ELEGISLATION

Project	Activity	Priorities
P01	Legislation for eBusiness	– The Law on Electronic Business Activities in BiH – The Law on Electronic Signature in BiH – The Law on the Certification Body in BiH – The Ordinance on the measures and actions of use and protection of the electronic signature and advanced electronic signature, the means for making the electronic signature and advanced electronic signature and the certification system and mandatory insurance of the qualified certificates issuance service provider – The Ordinance on the technical rules and conditions of connecting the electronic signature certification systems – The Ordinance on the registry of electronic signature certification service providers that issue qualified certificates – The Ordinance on the records of electronic signature certification service providers.
P02	Legislation for eEducation and eGovernment	– The Law on University Education – The Law on Scientific and Research Activity – The Law on Textbooks – The Law on Secondary Trade and Technical Schools – The Law on Permanent Education – As well as the corrections to the legislation on the customs and taxes on purchasing equipment and software by educational institutions, as incentives to the purchases. – The Law on Pre-school, Primary, and General Secondary Education – The Law on Copyright – The Ordinance on Public Procurement – The Law on State Registrars (which can be divided into civil, security and economy ones) – The Law on the Protection of Personal Data – The Law on Central Records and the Exchange of Data

Project	Activity	Priorities
P03	Legislation for the ICT Infrastructure and ICT Industry	– The Law on the Establishment of the Institute for Standards, Measurements and Intellectual Property of Bosnia and Herzegovina ("Official Gazette of Bosnia and Herzegovina", No. 19/01) – The Law on Standardization of Bosnia and Herzegovina ("Official Gazette of Bosnia and Herzegovina", No. 19/01) – The Law on Telecommunication ("Official Gazette of Bosnia and Herzegovina", No. 2/24) – The Law on Free Access to Information in Bosnia and Herzegovina ("Official Gazette of Bosnia and Herzegovina", No. 28/00) – The Law on Copyright and Related Rights in Bosnia and Herzegovina ("Official Gazette of Bosnia and Herzegovina", No. 7/02) – The Law on Industrial Property in Bosnia and Herzegovina ("Official Gazette of Bosnia and Herzegovina", No. 3/02) – The Law on Consumer Protection in Bosnia and Herzegovina ("Official Gazette of Bosnia and Herzegovina", No. 17/02).

2. EEDUCATION

REMARK: Sequence in which activities are listed does not reflect order of priorities. All activities are considered as priorities and of strategic importance. Relatively, one to each other, activities are prioritized as:

(1) of essential importance – implementation must strat immediately;

(2) of strategic importance – implementation shall start as soon as possible;

(3) important activity – also of strategic importance, but implementation can be delayed.

2.1. PROGRAMS

Program	Priority	Activity	Field(s)	Executor and Participants	Period	Financial estimate
PG01	(3)	Establishing system of ICT education and certification of citizens by means of post-education and life-long learning	Post-education and life-long learning	Information Society Agency; Education Ministries; competent ministries for the field of economy, technologies etc.; BHITS Association, BiH eLearning Task Force, Certified education centers, FBiH and RS Standards and Assessment Agency	2005-2006., 12 months initially, and then in continued manner	– Initial costs around 100.000 KM; – 20.000KM/per month per education center
PG02	(2)	Including certified education and examination centers into the system of official (public and private) system of ICT education (secondary schools and faculties)	Post-education and life-long learning	Information Society Agency, Entity Ministries of Science and Education, Ministries of Labor/Employment Bureaus, Faculties/Universities, Pedagogic Institutes, Certified education and examination centers	2005-2006., 6-12 months initially, and then in continued manner	– No particular investments
PG03	(3)	Information Society Referential Center (Knowledge Navigation Center)	Increase of knowledge about the information society	Information Society Agency	2005-2006., 6-12 inauguration of center, and then in continued manner	– 300.000 KM Center inauguration – 180.000 KM annually

PG04	(2)	System of ICT education and certification of teachers in primary and secondary schools	Specialist ICT education	FBiH and RS Standards and Assessment Agency; Education Ministries and Pedagogic Institutes; Universities and education centers (private and public); Information Society Agency; Teachers of Information Science, primary and secondary schools – users	2005., preparation, then permanently	– Initial costs around 300.000 KM; – 100.000 KM annually
PG05	(3)	Registry of scientific and research work in BiH	Scientific and research work	National and University Library of BiH; State, Entity and Cantonal level competent Ministries; research-education network; Universities and other scientific and research institutions	2005-2006., preparation, then permanently	– Initial costs around 350.000 KM; – 150.000 KM annually
PG06	(3)	Accessibility of aggregate bibliographic data bases to the education and library system in Bosnia and Herzegovina	Scientific and research work; Libraries	National and University Library of BiH; Academic Network of BiH, Information Society Agency or separately formed body, AIC library consortium.	Permanent Activity	– 120.000 KM annually
PG07	(1)	LIS/OPAC cooperative system of cataloguing library resources	Libraries	COBISS Center; independent or libraries part of other institutions	Permanent Activity	– 200.000 KM annual budget – Additional participation of libraries
PG08	(1)	Acquiring, maintaining and using the national ECDL license	Specialist ICT education; Increase of digital literacy	ECDL BiH Association; Information Society Agency BiH; FBiH and RS Standards and Assessment Agency; Education Ministries and Pedagogic Institutes; OSCE as principal stakeholder - harmonization of education programs	2005. 12 moths of preparation and then permanent activity	– 200.000 KM initially – 180.000 KM annually
PG09	(2)	Digitalization of mobile cultural and historic heritage	Libraries	Consortium of Institutions involved in the domain of culture and leading libraries; Archive and library institutions and museums in Bosnia and Herzegovina	2005.-2015. Later on permanent activity	– 2.000.000 KM annually

2.2. PROJECTS

Project	Priority	Activity	Field(s)	Stakeholder and Participants	Period	Financial estimate
PJ01	(1)	Designing basics of IT study programs curricula and syllabi in accordance with EU trends	Specialist ICT education	Education Ministries; All BiH Universities; Consortium of teachers from IT Faculties in Sarajevo, Banja Luka, Tuzla and Mostar as separately organized professional body; BHITS Association	2005., 9 months	150.000 KM
PJ02	(3)	Launching internationally recognized and indexed scientific ICT magazine	Scientific and research work	One University or Faculty from BiH or Association of IT Professionals or the BiH Academic and Research Network; Ministries of Science - co financing of magazine; Universities and other scientific and research institutions - direct users	2005-2006. two first years	– 300.000 KM
PJ04	(1)	Revitalization of BIHARNET into a sustainable research-academic network	Research-academic networks	Information Society Agency BiH (if established by the end of 2004) or BIHARNET Center; Council of Ministers of BiH, Government of the Federation of BiH, Republika Srpska Government and competent Cantonal Ministries. All beneficiaries: Universities, schools (primary and secondary), institutes, museums, archives.	2005-2010., five year period	– 15.000.000 KM
PJ05	(1)	Connecting all education and research institutions to Internet	Connection	Research and Academic network of BiH; Council of Ministers of BiH, FBIH Ministry of Science and Technology, RS Ministry of Science and Technology , Cantonal and Entity Education Ministries, telecom operators and Internet Service Providers, all users: Universities , schools (primary and secondary),institutes, libraries, museums, archives, students dormitories	2005-2010., five year period	– 25.000.000 KM
PJ06	(1)	Enhancing and harmonizing computer capacities in teaching and scientific-research institutions	Computer capacities	Information Society Agency; National Academic and Research Network; BHITS – BiH Association of IT Professionals; Association BAIT, IT companies in BiH, and representative offices of world ICT equipment manufacturers; Institute of Standardization, Measuring, Patents and Intellectual Property of BiH ((BASMP)-Technical Committee; TC1 (Information Technologies); eLearning Task Force; Service Providers- telecoms and ISP; Education and research institutions(schools, Universities, institutes) – end users	10 years First three phases between 2005-2008. (3-4 years); 6 years for the last phase	– First three phases around 20.000.000 KM – Last phase around 80.000.000 KM

PJ07	(3)	Standardization of ICT capacities in education and research institutions	Computer capacities	Information Society Agency; (BASMP) – Technical Committee TC1 (Information Technologies); National Academic and Research Network; Faculties in ICT field; BHITS – BiH Association IT Professionals; Institute of Standardization, Measuring, Patents and Intellectual Property of BiH; Association BAIT, IT companies in BiH, and representative offices of world ICT equipment manufacturers; BiH eLearning Task Force ; Education and research institutions– end users	2005., 6 months	– 200.000 KM
PJ08	(2)	Development of electronic support to learning (eLearning) at BiH Universities	Electronically supported learning	eLearning Task Force; eLearning Centers/Institutes; University Computer Centers; National Academic and Research Network; University Academic Staff; Institute of Standardization, Measuring, Patents and Intellectual Property of BiH	2005-2007, 2-3 years	– 3.000.000 KM
PJ09	(2)	Preparing Uniform Development platform for EMIS in primary and secondary schools	Education Management Systems	Two Entity Education Ministries; Information Society Agency; Cantonal Education Ministries; representatives of primary and secondary schools	2005. 6 months	– 80.000 KM
PJ10	(2)	Designing and implementing type concept of EMIS for primary and secondary schools	Education Management Systems	Two Entity Education Ministries; Information Society Agency; Cantonal Education Ministries; representatives of primary and secondary schools	2005-2007. 2 years	– 550.000 KM – Annual maintenance 120.000 KM
PJ11	(2)	Preparing Uniform Development platform for University EMIS	Education Management Systems	Consortium of all Universities in BiH; Information Society Agency, Education Ministries at all levels	2005. 6 months	– 80.000 KM
PJ12	(2)	Designing and implementing University EMIS	Education Management Systems	Consortium of Universities interested in joint development of EMIS; competent Education Ministries	2005-2007. 2 years	– 750.000 KM – Annual maintenance 60.000 KM per University

PJ13	(3)	Set-up of database and applicative software for external evaluation of knowledge in primary and secondary schools	Computer capacities; Education Management Systems	Standards and Assessments Agency; Curriculum Agency, Ministries of Science and Education , Pedagogic Institute	2005-2006. 12 months	– 120.000 KM software design – 60.000 KM annual database maintenance
PJ14	(1)	Standardization of IT syllabus for secondary vocational schools and elective teaching in information science in general high school (gymnasiums)	Evolution of Curricula; Specialist ICT education	Curriculum Agency; Standards and Assessments Agency; Ministries of Science and Education ; Pedagogic Institute	2005-2006. 2 years	– 400.000 KM

2.3. INITIATIVES

Initiative	Prority	Activity	Field(s)	Stakeholder and Participants	Period	Financial estimate
IN01	(3)	Promotion of Open Source (OP) standard operation systems and applications at education and other public institutions	Computer capacities	LUG (Linux Association); Ministries of Education, Science and Technology, Ministries of Communication; BHITS Association	Permanently within planned timeframe 2005.-2010.	– 150.000 KM annually
IN02	(3)	Popularize use of ICT in education	Increase of knowledge about the information society	Association of IT Professionals of BiH; Media, electronic media in the first place (TV, radio, e-zines); INFO and MOBiH magazines, as well as similar information science magazines in BiH; Academic and Research Network of BiH; Primary and secondary schools and faculties	Permanent Activity	– 200.000 KM annually

2.4. OVERVIEW OF INDICATORS

Indicator	Definition of the indicator	Importance of the indicator	Weight factor	Validity	Availability
I1x	Division of computer users into groups relevant for analysis of digital literacy state	The indicator is important for a continuing monitoring of "digital gap" as well as for success of "digital literacy education process"	3	3	2
I2x	Division of Internet users into groups relevant for analysis of digital literacy state.	The indicator is important for a continuing monitoring of "digital gap" as well as for success of "digital literacy education process"	3	3	2
I3x	Division of the Internet users who have home access to internet into groups relevant for analysis of digital literacy.	The indicator is important for a continuing monitoring of "digital gap" as well as for success of "digital literacy education process"	3	3	2
I123	Index of "digital gap" (DIDIX).	The index measures the digital gap by measuring progress of so-called "risk groups". This index includes the access to internet, use of internet and use of computers.	3	3	2
I4x	Division of Internet users who use internet over two years into groups relevant for analysis of digital literacy.	The indicator shows the level of development of the information society as a whole. Persons who use the internet for over two years are more likely to use different on-line services and perform on-line transactions.	2	1	2
I5x	Division of the Internet users who use internet over 6 hours a week into groups relevant for analysis of digital literacy.	The indicator is important for identifying the potential users of home broadband access to internet.	2	1	2
I6	Communication via e-mail. The index measures the increase of Internet users who communicate with at least ¼ of their friends and acquaintances via e-mail.	The indicator shows to what extent the use of internet affected social contacts of users themselves.	2	2	3
I7	Possibility of potential creation of on-line content. The indicator shows how many internet users have enough knowledge and resources and feel capable of creating on-line content.	This indicator, in a slightly modified form than the one suggested by SIBIS (which considers the broadband access from home) can be used to show the desire for active participation in the knowledge society. The indicator can be modified for teachers and expert associates in schools aiming to develop the electronic content in the syllabus for certain field of study.	2	2	2
I8	Participation in ICT training of persons with working ability.	The indicator measures to what extent the employers, and employees and unemployed persons invest in the ICT education. The indicator is important for the life-long education.	3	2	1

Indicator	Definition of the indicator	Importance of the indicator	Weight factor	Validity	Availability
I9	Percentage of ICT study programs harmonized with EU standards (The Bologna Declaration and ECTS).	The indicator shows to what degree the institutions of higher education are harmonized with EU standards in the field of ICT. In the short-term, this indicator should be interpreted as the indicator of transition acquired, while in the long-term this indicator should be interpreted as the level of the education system compatibility. This indicator is important for tracking the information society development as it shows the level of modernity of the ICT syllabi in BIH.	4	4	4
I10	Use of ICT in teaching process, presentation of the students' term papers, seminar and secondary school graduation papers	The indicator shows to what extent the use of digital content in teaching is increasing.	4	4	3
I11	Increase of CD-ROM content in approved textbooks	The indicator shows to what degree the share of E-learning content is increasing in teaching process.	3	3	3
I12	Number of the Internet users who know how to find the source of desired information on the Internet	Using the Internet, we often need to select between different sources of information. This parameter is important because prior to evaluation of the information one should take into account the reliability of the source itself. This too is one of the skills appertaining to digital literacy.	3	1	1
I13	Number of the Internet users who know how to use search engines on the Internet	This skill is the part of digital literacy definition. Given the fact that there is a lot of information of the Internet, the user must be aware of ways of using search engines (e.g. using the search operators) in order to find the right information.	2	1	1
I14	Number of persons who feel capable of communicating via internet	The indicator refers to use of at least one of the following three internet media: E-mail, service for communication in real time (IRC/CHAT), creating one's own website. Possibility of communicating via internet is a necessary precondition for utilization of information society potentials. Possibility of communicating via internet is one of the skills appertaining to basic digital literacy.	3	1	1
I15	SCI equivalent at the level of Bosnia and Herzegovina	The indicator shows the relevance of scientific researches. The data would be used, for example, by universities for election of teachers' careers as well as by all those who raise funds for financing research projects in order to evaluate competence of the project participants.	5	4	4
I16	Computers with access to LAN	The indicator shows the degree of computer connection within an institution. It also shows the readiness of the institution to use all benefits that come along with the connection to the global network – Internet.	4	4	4

Indicator	Definition of the indicator	Importance of the indicator	Weight factor	Validity	Availability
I17	Number of computers with access to Internet	The indicator shows the level of computer connection to the Internet. This is a very important indicator because it shows to what degree is the institution involved in the contemporary stream of information.	4	4	4
I18	Number of teachers/employees who have their own e-mail address	The indicator shows to what extent teachers / employees use e-mail service. This is a very important indicator because it shows readiness of teachers / employees to use different Internet services.	4	3	3
I19	Number of pupils/students who have their own e-mail address	The indicator shows to what extent pupils/students use e-mail service. This is a very important indicator because it shows readiness of the pupils / students to use different Internet services.	4	3	3
I20	Access speed by computer connected to Internet	The indicator shows the quality of institution's connection to the Internet. This is an important indicator because it shows the speed of Internet connection of the institution's network computers.	4	4	4
I21	Use of computers in teaching process and scientific and research work	This indicator is important because it shows to what extent the computers are used in teaching process and scientific and research work. That is the field that represents the driving force of a country.	4	4	4
I22	Quality index of the computer equipment for teaching and scientific and research work	Complex software that is used in teaching process and scientific and research work require appropriate hardware. High quality hardware is precondition for computer-based education and high level research. The index increase shows the improvement of hardware in the field of teaching and scientific and research work in the country, which provides faster achievement of results in this field.	4	4	3
I23	Number of computers per 100 students in primary and secondary schools and universities	This indicator is important as it shows to what extent schools and universities are equipped with the computers.	4	4	4
I24	Development of electronically supported education at universities	The indicator shows the penetration of electronically supported distance education in university education. This indicator is important because it shows the application and development of e-Learning process at universities.	3	3	3

Indicator	Definition of the indicator	Importance of the indicator	Weight factor	Validity	Availability
I25	Number of education institutions with multimedia office	This number shows to what degree the schools are equipped – in fact, it shows ICT capacities which represent a factor necessary for computerization of a society. It serves as a basis to plan procurement of ICT equipment.	4	5	5
I26	Number of certified ICT users	The indicator shows the general level of computer literacy. This indicator is important as it is easily accessible and very objective / a valid indicator of the literacy level.	4	5	4
I27	Professional competence of the informatics teachers according to pedagogical standards	The indicator shows the number of informatics teachers in primary and secondary schools who meet 100% of qualification requirements. This indicator is important because these teachers are the key factor in disseminating the knowledge in the field of ICT to the younger population.	3	3	4
I28	Digital literacy index	One of the main goals of e-Europe 2005 is to raise the level of digital literacy. Rise in value of COQS index points to the rise of digital literacy level of an individual/organization/society.	3	1	1

3. eGOVERNANCE

REMARK: Sequence in which activities are listed does not reflect order of priorities. All activities are considered as priorities and of strategic importance. Relatively, one to each other, activities are prioritized as:

(1) of essential importance – implementation must strat immediately;

(2) of strategic importance – implementation shall start as soon as possible;

(3) important activity – also of strategic importance, but implementation can be delayed.

3.1. ACTIVITIES

No.	Prio-rity	Activity	Type	Field	Stakeholder and participants	Timeframe	Fin (KM)
1	(1)	Drafting detailed network plan of implementation of projects envisaged by the Action Plan	F	(1-11)	AIS, ENT, DISTR	2004	500 000
2	(1)	Ensuring legislative framework for eGovernance development	F, U	RU (1)	AIS, SMBH, ENT, DISTR	2004 – 2006	250 000
3	(2)	Reconstruction of administration	F	RU (1)	AIS, SMBH, ENT, DISTR	2004 – 2006	2 000 000
4	(3)	Promotion of introduction of eGovernance	O	RU (1)	AIS, SMBH, ENT, DISTR	Continuous	100 000 annually
5	(1)	Formation of bodies/services tasked with informatization and strategy implementation and identification of persons-stakeholders for informatization in government bodies	P	TRO (2)	SMBH, ENT, DISTR, KAN, LOK	2004	-
6	(3)	Establishment of the eGovernance Development Forum	O	(1) - (11)	AIS, ENT, DISTR, KAN, LOK	2004	-
7	(3)	Establishment of eMunicipalities Association	O	(1) - (11)	LOK	2004	-
8	(1)	Analysis of potential and recommendations for computer program of open software	F	TRO (2)	AIS, ENT, DISTR	2004 – 2005	300 000
9	(2)	Development and definition of methodology for development of programs and systems in public administration	P	TRO (2)	AIS, ENT, DISTR	2004 - 2005	200 000
10	(3)	Development of management methodology for information-communication projects in public administration	P	TRO (2)	AIS, ENT, DISTR	2004 - 2005	200 000

No.	Prio-rity	Activity	Type	Field	Stakeholder and participants	Timeframe	Fin (KM)
11	(1)	Identification, systematization and adoption of standards necessary for development of information society in Bosnia and Herzegovina	F	TRO (2)	AIS, ENT, DISTR	2004 – 2006	200 000
12	(3)	Training and education of staff	P	TRO (2)	AIS, ENT, DISTR, KAN, LOK	Continuous	300 000 annually
13	(1)	Communication infrastructure project in the public sector of Bosnia and Herzegovina	F	INFRA (3)	AIS, ENT, DISTR, telecom operators, Elektroprivreda, Railways, private sector	2004 – 2005	500 000
14	(1)	Implementation of the communication infrastructure project in the BiH public sector	F	INFRA (3)	AIS, ENT, DISTR, KANT, LOK	2006 – 2007	30 000 000
15	(1)	Defining concepts and standards for IT inter-operability in the public sector	F	MOPER (4)	AIS, ENT, DISTR	2004 – 2005	350 000
16	(2)	Implementation of pilot project to verify and render operational the inter-operability concept	F	MOPER (4)	AIS, ENT, DISTR	2006 – 2007	350 000
17	(3)	Establishment of the IT Inter-operability Forum	O	MOPER (4)	AIS, ENT, DISTR, KAN, LOK, private sector	2005	-
18	(3)	SMS Gateway	O	MOPER (4)	AIS	2004 – 2005	100 000
19	(3)	Information exchange server - National Gateway Server	O	MOPER (4)	SMBH, AIS,	2004 – 2005	300 000
20	(2)	Management of electronic records	F	FR (5),	AIS	2004 – 2005	200 000
21	(1)	Procedures and conditions of access and use of information from fundamental registers	F	FR (5)	AIS	2004 – 2005	80 000
22	(1)	On-line personal and vehicle registration documents	F, U	FR (5), SER(10)	AIS	2006 – 2008	600 000
23	(1)	On-line registration of change of residence	U	FR (5), SER(10)	AIS	2007 – 2008	200 000

No.	Prio-rity	Activity	Type	Field	Stakeholder and participants	Timeframe	Fin (KM)
24	(1)	Register of residence licenses for foreigners, visas, records of entries in and exit out of BiH	U	FR (5), SER(10)	SMBH, AIS	2004 – 2005	1 000 000
25	(1)	Harmonization and connection/integration of partial registers	F	FR (5)	AIS, ENT, DISTR, KAN, LOK	2004 – 2007	1 000 000
26	(2)	Tax system	F, E, U	FR (5), ZFU (7), SFU (8)	AIS	2004 – 2006	4 000 000
27	(2)	Tax system – on-line	F, E, U	FR (5), SER(10)	AIS	2007 – 2009	2 000 000
28	(2)	Customs declarations– on-line	U	FR (5) , SER(10)	AIS	2007 – 2008	400 00
29	(2)	Security strategy in organizational units of the administration	F	SIG (6)	AIS, ENT, DISTR	2004 – 2005	80 000
30	(1)	Defining and developing uniform authentification and authorization system	F	SIG (6)	AIS, ENT, DISTR, KAN, LOK	2004 – 2006	1 200 000
31	(2)	Project to introduce PKI infrastructure	F	SIG (6)	AIS, ENT, DISTR	2004 – 2006	200 000
32	(2)	Pilot project to implement PKI infrastructure	F	SIG (6)	AIS, ENT, DISTR,	2006 – 2007	1 000 000
33	(2)	Identification of joint functions of the administration	F	ZFU (7)	ENT, DISTR, AIS, KANT, LOK	2004	80 000
34	(2)	e-mail service in public administration	F	ZFU (7)	ENT, DISTR, AIS, KANT, LOK	2004 – 2005	300 000
35	(2)	Project and implementation of EDMS and Workflow systems	F, E	ZFU (7)	ENT, DISTR, AIS, KANT, LOK	2005 – 2007	6 000 000
36	(2)	eProcurement in public administration– Project	F, U	ZFU (7)	AIS, ENT, DISTR	2004 – 2005	200 000
37	(2)	eProcurement in public administration– Pilot-project	F, U	ZFU (7)	AIS, ENT, DISTR	2006 – 2007	500 000
38	(2)	Implementation of eProcurement in public administration [e]	F, U	ZFU (7)	AIS, ENT, DISTR	2007 – 2008	3 000 000
39	(2)	Project to define statistical parameters and indicators of development of eGovernance, method of collecting and monitoring	F, U	ZFU (7)	Stat. agencies/inst., AIS, ENT, DISTR	2004 – 2005	100 000

No.	Prio-rity	Activity	Type	Field	Stakeholder and participants	Timeframe	Fin (KM)
40	(3)	Automatized (on-line) submission of information to institutions dealing with statistics	U	ZFU (7), SER (10)	AIS, ENT, DISTR, statistics institutes	2007 – 2010	2 500 000
41	(2)	Monitoring eGovernance development	F	(1-11)	Stat. Agencies/inst., AIS, ENT, DISTR	2005 -	1 000 000
42	(1)	Citizens Database – Municipal register offices (births, marriages, deceased and book of nationality-holders)	F, E, U	FR (5), ZFU (7), SFU (8)	LOK, ENT, DISTR, KANT, AIS,	2004 - 2006	1 200 000
43	(2)	Citizens Database – Municipal register offices (births, marriages, deceased and book of nationality-holders)– on-line	F, E, U	FR (5), ZFU (7), SFU (8), SER (10)	LOK, ENT, DISTR, KANT, AIS	2007 - 2008	800 000
44	(1)	Land and real-estate register	F	SFU (8)	ENT, DISTR, KANT, LOK, AIS	2004– 2007	6 000 000
45	(2)	Land and real-estate register – on-line	F	SFU (8)	ENT, DISTR, KANT, LOK, AIS	2007 – 2008	2 000 000
46	(2)	Information system for personnel and legal affairs	E	SFU (8)	ENT, DISTR, KANT, LOK, AIS	2004 – 2005	300 000
47	(1)	Computer programs for construction licenses	U	SFU (8)	LOK, ENT, DISTR, KANT, AIS	2004 – 2006	1 200 000
48	(2)	Computer programs for construction licenses– on-line	U	SFU (8) SER(10)	LOK, ENT, DISTR, KANT, AIS	2007 – 2009	1 500 000
49	(2)	Job search	U	SFU (8)	ENT, DISTR, KANT, AIS, LOK	2007 – 2008	500 000
50	(2)	Social privileges	U	SFU (8)	LOK, ENT, DISTR, KANT	2007 – 2008	500 000
51	(2)	Social benefits for employees	U	SFU (8)	ENT, DISTR, KANT, LOK	2007 – 2008	800 000

No.	Prio-rity	Activity	Type	Field	Stakeholder and participants	Timeframe	Fin (KM)
52	(2)	Environment-related licenses	U	SFU (8)	LOK, ENT, DISTR, KANT,	2007 – 2008	500 000
53	(2)	Information system for inspection tasks	O	SFU (8)	AIS, ENT, DISTR, KANT, LOK	2005	500 000
54	(1)	Register of legal entities	F	SFU (8)	AIS, ENT, DISTR, KANT, LOK	2005 - 2006	300 000
55	(2)	Register of domestic animals	O	SFU (8)	Agency	2005- 2006	700 000
56	(3)	eParticipation	O	DEM (9), SER (10), PORT (11)	AIS, ENT, DISTR, KANT, LOK	2007 – 2008	900 000
57	(3)	Generic eService project	F, U	SER (10)	AIS, ENT, DISTR, KANT, LOK	2005 – 2006	250 000
58	(3)	All municipalities on Internet	F, E, U	PORT (11)	AIS, ENT, DISTR, LOK	2004 – 2005	1 600 000
59	(1)	State portal	F, E, U	PORT (11)	AIS, ENT, DISTR,	2004 – 2005	1 000 000

3.2. INDICATORS

Indicator	Indicator definition	Importance of the indicator	Wight factor	Validity	Availability
1	Number of basic public services available on-line	This indicator directly shows the level of eGovernance development. Based on comparison of other countries in Europe, one can determine a level of modernization of public administration in light of information society development and readiness of Bosnia and Herzegovina to integrate into EU.	5	-	3
2	Evaluation (IDA methodology) of electronic services	This indicator is extremely useful for quality evaluation of some electronic service.	4	-	4
3	Knowledge of citizens and business systems on availability of on-line public services	This indicator is very important because success of eGovernance concept depends on resource of access, which is the focus of this indicator.	3	-	3
4	Use of public on-line services by citizens and business systems	This indicator is very important because success of eGovernance primarily manifests in actual use and access made by citizens and business systems.	3	-	3
5	Indicator of information infrastructure security	This indicator is important because SECURITY of transactions and communication is of key importance for computer program of information and communication technologies and information society development of eGovernance. Security problems are usually manifested as misuse of electronic cards, damage caused by virus, misuse of personal data, illegal acquisition of business information.	4	-	4

4. ICT INFRASTRUCTURE

REMARK: Sequence in which activities are listed does not reflect order of priorities. All activities are considered as priorities and of strategic importance. Relatively, one to each other, activities are prioritized as:

(1) of essential importance – implementation must strat immediately;

(2) of strategic importance – implementation shall start as soon as possible;

(3) important activity – also of strategic importance, but implementation can be delayed.

4.1. ACTIVITIES

Project	Activity	Executors and Participants	Period	Financial projection
PJ01	ICT-Highway	The Council of Ministers and entity governments; Positioned 3 TK operators in BIH; Electrical Power Company, Railroad Company (additional and alternative solutions); State Projects: CIPS, State Border Service, Customs Administration etc. Institute for Traffic, universities – Faculty of Electrical Engineering and the Faculty of Traffic and Communications; Independent Consulting Company	2004-2006	– Project preparation circa 100.000 KM; – Implementation circa 5.000.000 KM
PJ02	IP-telephony	Three positioned TC operators in BIH; Institutes, professional associations, consulting companies, Faculty of Electrical Engineering and the Faculty of Traffic and Communications; Regulatory Communications Agency; Mobile operators;	2004-2006	– Project preparation circa 50.000 KM; – Implementation circa 3.000.000 KM
PJ03	DTM Network – Pilot-project of introducing new network technology – DTM for integrated service networks	Three positioned TC operators in BIH; Institutes, professional associations, consulting companies, Faculty of Electrical Engineering and the Faculty of Traffic and Communications;	2004-2006	– Project preparation circa 50.000 KM; – Implementation circa 1.000.000 KM
PJ04	VPN Network –VPN service introduction project	Three positioned TC operators in BIH; Institutes, professional associations, consulting companies, Faculty of Electrical Engineering and the Faculty of Traffic and Communications; Electrical Power Company, Railroad Company; government organizations; health care institutions; Universities; schools, libraries; business companies; banks and insurance companies; police, ...	2004-2006	– Project preparation circa 50.000 KM; – Implementation circa 1+20.000.000 KM

PJ05	Migration from 2G to 2,5 MK --- Evolution from 2G to 3G mobile communication systems	Licensed mobile communications operators in BIH; Institutes, professional associations, consulting companies, Faculty of Electrical Engineering and the Faculty of Traffic and Communications; Electrical Power Company; service providers	2004-2006	– circa 50.000 KM;
PJ06	Broadband access networks: xDSL, HFC, PLC, broadband access	Three positioned TC operators in BIH; network operators, electrical power companies, cable operators. Institutes, professional associations, consulting companies, Faculty of Electrical Engineering and the Faculty of Traffic and Communications; Service providers	2004-2005	– circa 150.000 KM;
PJ07	Ethernet WAN – Pilot-project of the creation of MAN network with Ethernet access to the core network	Three positioned TC operators in BIH; Institutes, professional associations, consulting companies, Faculty of Electrical Engineering and the Faculty of Traffic and Communications; Electrical Power Company, Railroad Company, and new network operators	2004-2006	– Project preparation circa 50.000 KM; – Implementation circa 2.000.000 KM
PJ08	W LAN – Pilot-project of W LAN creation	Three positioned TC operators in BIH, each for its network; Institutes, professional associations, consulting companies, Faculty of Electrical Engineering and the Faculty of Traffic and Communications; New telecommunication services operators	2004-2005	– Project preparation circa 50.000 KM; – Implementation circa 500.000 KM
PJ09	Portal development	Agency for information society, Institutes, professional associations, consulting companies, Faculty of Electrical Engineering and the Faculty of Traffic and Communications, three positioned TC operators in BIH, service providers, government institutions.	2004-2005	– circa 200.000 KM;

4.2. THE OVERVIEW OF INDICATORS

Indicator	Indicator Definition	Indicator Importance	Value factor	Validity	Availability
I01	Installed capacities	Availability of all installed capacities. This parameter is required to indicate the availability level in accordance with total market potential, and the total number of users, that in relation to the use percentage provides the profitability rating.	4	5	5
I02	Penetration of fixed users	Provides the rating of the number of users per 100 inhabitants. The indicator most frequently used as the indicator of development of a telecommunication service.	5	4	5
I03	Penetration of mobile users	Provides the rating of the number of users per 100 inhabitants. The indicator most frequently used as the indicator of development of a telecommunication service. It is divided in accordance with the user type number: total, postpaid and prepaid.	5	5	5
I04	Penetration of Internet users	Provides the rating of the number of users per 100 inhabitants. The indicator most frequently used as the indicator of development of a telecommunication service.	5	5	5
I05	Penetration of Cable TV users	Provides the rating of the number of users per 100 inhabitants or 100 households. The indicator most frequently used as the indicator of development of a telecommunication service.	5	5	5
I06	Penetration of number of computers used	Provides the rating of the number of users per 100 inhabitants or 100 households. Especially important in relation to the country GDP.	5	4	3
I07	Penetration of TV users – subscribers	Provides the rating of the number of users per 100 inhabitants or 100 households. The indicator most frequently used as the indicator of development of a telecommunication service.	5	5	4
I08	Penetration of Web users	Provides the ration of the number of Web sites.	4	4	5

5. ICT INDUSTRY

REMARK: Sequence in which activities are listed does not reflect order of priorities. All activities are considered as priorities and of strategic importance. Relatively, one to each other, activities are prioritized as:

(1) of essential importance – implementation must strat immediately;

(2) of strategic importance – implementation shall start as soon as possible;

(3) important activity – also of strategic importance, but implementation can be delayed.

5.1. GENERAL ACTIVITIES

Activity	Priority	Activity	Type of Act.	Executor and Participants	Period	Financial Estimate
A1	(2)	Motivating Customs and Tax Measures	Initiative	Ministry of Finance of BIH/Entity Ministries of Finance; Council of Ministers of BIH and Entity Governments (adopting decisions in the initiative realization process)	Finish by June 2005	no expenses
A2	(2)	Motivating Early Local Supply and Demand Measures	Initiative	Ministry of Economy and International Trade; Ministry of Finance of BIH; Council of Ministers of BIH (adopting decisions in the initiative realization process)	Finish by June 2005	50.000 KM
A3	(1)	Credit Insurance Agency (for ICT Industry stimulation credits)	Initiative/ Action	Ministry of Finance of BIH; Council of Ministers of BIH (adopting decisions in the initiative realization process)	Finish by end of 2004	200.000 KM
A4	(2)	Statistical Instruments of ICT Industry Monitoring	Project	Institute of Statistics of Bosnia and Herzegovina; Consumer Association; Chamber of Commerce	Finish by end of 2004	500.000 KM
A5	(1)	e-Legislation	Program/ Project	Ministry of Communication and Transport and UNDP CO BiH; Ministry of Justice; Ministry of Economy and International Trade of Bosnia and Herzegovina; State Court of Bosnia and Herzegovina.	Implementation has started. Finish expected by mid' 2005.	980.000 KM

5.2. SPECIAL ACTIVITIES

Activity	Priority	Activity	Type of Act.	Executor and Participants	Period	Financial Estimate
A6	(1)	Technology park in the area of ICT	Project	Agency of Information Society of BIH; University and Faculties; local authorities; ICT companies	2004-2005.	Pilot: 3.000.000 KM
A7	(1)	Incubation center in the area of ICT	Project	Agency of Information Society of BIH; Foreign Investments Agency; Local Administration; University	2004-2005.	Pilot: 550.000 KM
A8	(3)	"Telecom Cluster" of the ICT services	Project /Pilot	Positioned operators of TC; Potential producers, recruited by the Association or Chamber of Commerce	2005	Pilot: 4.000.000 KM
A9	(3)	"Elektroprivreda Cluster" of the ICT services	Project /Pilot	Electrical companies (EC) in BIH; Potential producers, recruited by the Association or Chamber of Commerce	2005-2006	Pilot: 2.000.000 KM
A10	(3)	Cluster production of ICT hardware	Project /Pilot	Agency for Information Society; Chamber of International Trading of BIH	2005-2006	Pilot: 2.000.000 KM
A11	(3)	Cluster production of ICT software	Project /Pilot	Agency for Information Society; Chamber of International Trading of BIH	2005-2006	Pilot: 2.000.000 KM

5.3. OVERVIEW OF INDICATORS

Indicator	Definition of the indicator	Importance of the indicator	Weight factor	Validity	Availability
1.A.1.	Infrastructure (penetration)	Basic indicators: Number of main fixed telephone connections per 100 inhabitants Total number of subscribers per 100 inhabitants (natural and legal persons) Total number of subscribers/users of fixed telephony services (natural and legal persons) Total number of subscribers/users of mobile telephony services (natural and legal persons) Number of PC per 100 inhabitants Number of Internet users per 100 inhabitants (natural and legal persons) Total number of subscribers/users of Internet services (natural and legal persons) Monthly phone subscription fee for households Monthly mobile phone subscription fee Monthly phone subscription fee for legal persons Number of Internet hosts (at the international level available from Internet Software Consortium (ISC)) Other indicators: Number of Internet subscribers per 100 inhabitants (natural and legal persons) Number of web sites per 1000 inhabitants Number of web pages hosted in BIH Internet access costs	5	4	4

1.A.2.	Trade (imports and exports)	Variables: ICT products exports and imports value Total exports and imports value Indicators: Trade balance of the ICT sector (ICT exports minus ICT imports divided by total trade balance of production (exports and imports average)) ICT exports increase ICT imports increase ICT exports as total exports % ICT imports as total imports %	5	4	4
1.A.3.	Qualifications (training)	Share of population with completed secondary education Share of population with completed tertiary education Ratio of primary, secondary and tertiary education Share of population with a degree in ICT field (as % of total number of university graduates and as % of appropriate age group)	5	4	4
1.B.1.	Use of ICT (share of ICT industry in total economy)	Variables: Production value Added Value Employment Indicators: Share of added value in ICT sector in relation to total business sector added value ICT sector added vale increase Share of ICT sector employment in total business sector employment Increase of ICT sector employment Share of ICT sector production in total business sector production Increase of ICT sector production	5	3	4
1.B.2.	Readiness of households and population for the use of ICT (penetration and use of ICT)	Pokazatelji Share of households owning a PC (% of total) Share of households with Internet access (% of total) Share of individuals (older than 16) who access the Internet – per location Share of individuals (older than 16) who use the Internet – per activity	5	3	4

1.B.3.	Readiness of legal persons for the use of ICT (penetration and use of ICT)	Share of legal persons owning a PC (% of total) Share of legal persons which use PCs (% of total) Share of legal persons that use the Internet (% of total) Share of legal persons that access the Internet – per type of connection Share of employees who use the Internet (% of total) Share of legal persons with a web site (% of total) Share of legal persons that receive orders via Internet (% of total) Value of orders received via Internet (% of total) Share of legal persons that send orders via Internet (% of total)	5	4	4
1.B.4.	ICT patents	Variables: Number of ICT patents Total number of patents Indicators: ICT patents as % of total patent number ICT patents as % of total number of ICT patents in the world Increase of ICT patents	5	5	5

eLegislation

6. ACTION PLAN

6.1. PROJECTS

6.1.1. PROJECT 1 (LEGISLATION FOR EBUSINESS)

Activity 1. A team of local experts will review and analyze the legislation of the international organization in this area, review the relevant EC documents, the state of legislation in developed countries and the state of regulation in BIH. on the basis of that information, they will prepare a description of the desired state in BIH in this area, while identifying the deficiency of the current state. (The deadline for this project stage is the summer of 2004).

Aim 1. Perform the review of necessary legislation in BIH and identify the deficiency in the existing legislation.

Activity 2. Based on the analysis of the international regulation in this area, and especially of the relevant EC documents, the team of local experts will review the existing and prepare the first draft of the new legislation. (The deadline for this stage of the Project is the end of 2004).

Aim 2. Prepare the first draft of the reviewed of new legislation.

Activity 3. Submit the first draft of the reviewed or new legislation for a public debate, that will include: a public debate open to all subjects, a public debate to which experts from the areas covered by the legislation will be invited, a public debate to which the representatives of the international community in BIH will be invited. (The deadline for this stage of the Project is January 1, 2005 – March 1, 2005).

Aim 3. Documenting the findings from the reports from the public debates on the draft of the legislation.

Activity 4. On the basis of the information gathered from the public debates and its analysis, the legislation draft shall be reviewed in the way considered adequate and suitable, with the aim of its more efficient adoption by the legislative body and its simpler implementation. (The deadline for this stage of the Project is the spring of 2005).

Aim 4. The final draft of the legislation based on the previous consultation procedures.

Activity 5. Approval of the final draft of legislation by the adequate legislative authority. (The precise deadline is not under control of the Project.).

Aim 5. Approval of the legislation draft by the legislative authority.

<u>Priorities</u>

Priority tasks of the Project: Legislation for eBusiness are the adoption of the legislation, i.e. the following:

- The Law on Electronic Business of Bosnia and Herzegovina
- The Law on Electronic Signature of Bosnia and Herzegovina
- The Law on the Certification Body of Bosnia and Herzegovina
- The Ordinance on the measures and actions of use and protection of the electronic signature and advanced electronic signature, the means for making the electronic signature and advanced electronic signature and the certification system and mandatory insurance of the qualified certificates issuance service provider;

- The Ordinance on the technical rules and conditions of connecting the electronic signature certification systems;
- The Ordinance on the registry of electronic signature certification service providers that issue qualified certificates;
- The Ordinance on the records of electronic signature certification service providers.

6.1.2. PROJECT 2 (LEGISLATION FOR EDUCATION AND GOVERNMENT)

Activity 1. A team of local experts will review and analyze the legislation of the international organization in this area, review the relevant EC documents, the state of legislation in developed countries and the state of regulation in BIH. on the basis of that information, they will prepare a description of the desired state in BIH in this area, while identifying the deficiency of the current state. (The deadline for this project stage is one month).

Aim 1. Perform the review of necessary legislation in BIH and identify the deficiency in the existing legislation.

Activity 2. Based on the analysis of the international regulation in this area, and especially of the relevant EC documents, the team of local experts will review the existing and prepare the first draft of the new legislation. (The deadline for this stage of the Project is four months).

Aim 2. Prepare the first draft of the reviewed of new legislation.

Activity 3. Submit the first draft of the reviewed or new legislation for a public debate, that will include: a public debate open to all subjects, a public debate to which experts from the areas covered by the legislation will be invited, a public debate to which the representatives of the international community in BIH will be invited. (The deadline for this stage of the Project is three months).

Aim 3. Documenting the findings from the reports from the public debates on the draft of the legislation.

Activity 4. On the basis of the information gathered from the public debates and its analysis, the legislation draft shall be reviewed in the way considered adequate and suitable, with the aim of its more efficient adoption by the legislative body and its simpler implementation. (The deadline for this stage of the Project is one month).

Aim 4. The final draft of the legislation based on the previous consultation procedures.

Activity 5. Approval of the final draft of legislation by the adequate legislative authority. (The precise deadline is not under control of the Project.).

Aim 5. Approval of the legislation draft by the legislative authority.

6.1.3. PROJECT 3 (LEGISLATION FOR THE ICT INFRASTRUCTURE AND ICT INDUSTRY)

Activity 1. A team of local experts will review and analyze the legislation of the international organization in this area, review the relevant EC documents, the state of legislation in developed countries and the state of regulation in BIH. on the basis of that information, they will prepare a description of the desired state in BIH in this area, while identifying the deficiency of the current state. (The deadline for this project stage is one month).

Aim 1. Perform the review of necessary legislation in BIH and identify the deficiency in the existing legislation.

Activity 2. Based on the analysis of the international regulation in this area, and especially of the relevant EC documents, the team of local experts will review the existing and prepare the first draft of the new legislation. (The deadline for this stage of the Project is four months).

Aim 2. Prepare the first draft of the reviewed of new legislation.

Activity 3. Submit the first draft of the reviewed or new legislation for a public debate, that will include: a public debate open to all subjects, a public debate to which experts from the areas covered by the legislation will be invited, a public debate to which the representatives of the international community in BIH will be invited. (The deadline for this stage of the Project is three months).

Aim 3. Documenting the findings from the reports from the public debates on the draft of the legislation.

Activity 4. On the basis of the information gathered from the public debates and its analysis, the legislation draft shall be reviewed in the way considered adequate and suitable, with the aim of its more efficient adoption by the legislative body and its simpler implementation. (The deadline for this stage of the Project is one month).

Aim 4. The final draft of the legislation based on the previous consultation procedures.

Activity 5. Approval of the final draft of legislation by the adequate legislative authority. (The precise deadline is not under control of the Project.).

Aim 5. Approval of the legislation draft by the legislative authority.

6.2. IMPLEMENTATION SUBJECTS

- The Council of Ministers of Bosnia and Herzegovina
- Entity governments
- Relevant Ministries of entities and BIH
- Relevant international organizations (OHR, EC Commission).

eEducation

7. ACTION PLAN

7.1. PROGRAMS

Type of activity:	Program (PG01)	
Title of Activity:	Establishment of the system of ICT education and certification of citizens through post-education and life-long learning	
Stakeholder:	Information Society Agency BiH	
Participants:	– Competent ministries in the domains of: economy, industry, technology etc. State, Cantonal or Entity level. – Education Ministries – BHITS Association – BiH eLearning Task Force – Certified education centers (private and public) and Universities - in the capacity of provider of education services – FBiH and RS Standards and Assessment Agency	
Description of activities:	Create favorable conditions for quality IT education of BiH citizens through post-education and life-long learning. Accreditation and certification will ensure they are IT trained/literate at appropriate level and that they will receive relevant and adequate certificate.	
Expected outcome:	Defining minimum IT literacy in BiH Harmonization of training programs and evaluation of IT knowledge and skills all over BiH Harmonization of evaluation of IT knowledge and skills with European standards (ECDL or similar).	
Components:	Defining number of users	Estimate number of potential users (needs assessment for such type of certificate), validity of certificates and knowledge level (need for eventual additional education)
	Defining service providers	Set procedures and criteria to accredit centers that will conduct training and issue ICT certificates to citizens BiH-wide (by means of post-education and life-long learning).
	Training and certification	Implementation of activity
Preconditions:	Existence of accredited education and certification centers at Entity and State level. In order for the ECDL Association of IT Professionals of BiH to be recognized with the European ECDL Association, it should be registered for two years as national association and be a member of CEPIS Change of legislation in terms of obligation for certification as precondition for organization of teaching.	
Execution period:	Preparations – 12 months; Implementation - permanent	
Financial prognosis:	Initial costs for creation of preconditions for pilot accreditations are around 100.000 KM. Subsequent costs are estimated at around 20.000 KM/a month per education center.	
Critical implementation factors		
Funding sources	– Increase of digital literacy is in the interest of the country and such programs can only be partially commercial. That is why the state has to fund most activities (Council of Ministers, Entity and Cantonal Governments). For preparation and inauguration of projects, first pilot accreditations – we can count on grants of big companies and the international community. – Annual membership of founder and members applying for accreditation.	

Labor market, human resources, necessary knowledge and skills	Existing professional potential in BiH can implement project activities. State strategy on increase of IT literacy in BiH should find support in introduction of accreditation in all institutions dealing with education and certification of IT skills of citizens through post-education and life-long learning. This is a manner to use and advance human potentials in already established centers.
Development environment	The most significant assistance the BiH Government can render to the implementation of this Project is to define accreditation procedure for national (state) license. That is why appropriate regulations and legislation needs to be urgently adopted to define all accreditation requirements
Technologies	When defining the accreditation procedure, we must ensure appropriate level of technology in centers to be accredited. In order for the centers to be accredited, advance ICT technologies and their efficient use must be rigorously checked. Satisfactory technological level, apart from: appropriate hardware, licensed software, also understands all modern forms of electronic support to education and verification of trainees' knowledge.
Time frame	Working teams, basic legislation and pilot applications programs will be prepared during the first year of project implementation. Following that, permanent task will be to conduct and advance ICT education and certification of citizens through post-education and life-long learning.
Implementation monitoring	Information Society Agency, competent Education Ministries at State, Entity and Cantonal level
Risks	Insufficient cooperation of relevant bodies at Entity and State level during introduction of accreditation in institutions for implementation of post-education and life-long learning.

Type of activity:	Program (PG02)
Title of Activity:	Including certified education and examination centers into the system of official (public and private) system of ICT education (secondary schools and faculties)
Stakeholder:	Information Society Agency
Participants:	– Entity Ministries of Science and Education (FBiH and RS) – Ministries of Labor/Employment Bureaus – Faculties/Universities – Pedagogic Institutes – Certified education and examination centers
Description of activities:	Selection of globally recognized ICT certificates that will be recognized as skilled qualifications at level of secondary school (recorded in) and/or "equivalent" exams at faculties
Expected outcome:	Introducing order on the market of the unofficial education system, which will assist the trainees, those interested in additional training and re-qualification as well as employers in estimating the credibility of diplomas acquired outside the official education system Assisting Faculties in securing resources (teaching staff and offices) Harmonization of curricula with the aim to increase student mobility
Preconditions:	Agreement of participants in the program (Faculty curricula, ...), Set legislation (Law on Higher Education, Law on Secondary Education, Law of Life-long Education.)
Execution period:	Harmonization for the first 6-12 months, continued later on Start of implementation must be harmonized and can start only once the aforementioned conditions are met
Financial prognosis:	No greater investments, because it can be implemented within regular activities
Critical implementation factors	

Funding sources	Initial funds could be secured from funds allocated for re-qualification of persons dismissed as "surplus employees" (army, different budget organizations etc., ...) or because of bankruptcy, while we could also use some funds from the privatization Certified education/test centers for every proposed certificate
Labor market, human resources, necessary knowledge and skills	There is a number of private education and test centers in BiH that dispose of teaching and examining staff
Development environment	Legislation must be valid throughout BiH
Implementation monitoring	Records will need to be kept of accepted (as exam or skilled qualification) and recognized (if agreed upon) exams passed
Risks	Hyper production of education and/or test centers with "mass" production of questionable certificates

Type of activity:	Program (PG03)
Title of Activity:	Information Society Referential Center (Knowledge Navigation Center)
Stakeholder:	Information Society Agency
Participants:	Information Society Agency
Description of activities:	Information Society Referential Center is the knowledge navigation center on processes taking place as part of implementation of the information society development strategy in BiH. This Center is tasked with collecting, processing and disseminating relevant information on the status of different activities in the information society.
Expected outcome:	Database on projects and implementation results benchmarking center (expanded functions) improving information quality to users and information service providers public relations – Promotional activity on-line web portal
Preconditions:	Adopting Information Society Development Strategy of BiH and establishing the Information Society Agency.
Execution period:	Permanent activity
Financial prognosis:	300.000 KM Center inauguration 180.000 KM (annually)
Critical implementation factors	
Funding sources	Budget
Labor market, human resources, necessary knowledge and skills	There are necessary human resources to establish this Center. Considering the principal role of the Center, it can have fewer employees. For implementation of more complex occasional activities, ICT and library system experts could be contracted.
Technologies	Standard functions of the Referential Center – library Internet service (web portal)
Time frame	Referential Center will be inaugurated during the first year. Existence and activities of the Center will be entirely regulated. By regulating status of project and indicators proposed in this paper, we will create preconditions for the Center to operate. After 12 months, the Center will commence carrying out its primary work, as well as lasting activities.
Implementation monitoring	Information Society Agency
Risks	Inexistence of the referential center could gravely slow down monitoring and modifications necessary for implementation of complex programs and projects in the implementation of the Information Society Strategy.

Type of activity:	Program (PG04)
Title of Activity:	System of ICT education and certification of teacher in primary and secondary schools
Stakeholder:	FBiH and RS Standards and Assessment Agency
Participants:	– Education Ministries and Pedagogic Institutes – Universities and education centers (private and public) – Information Society Agency – Teachers of IT subject, primary and secondary schools - users
Description of activities:	In order to secure quality system of IT education of students in the public and private education system (primary and secondary schools), all teachers of IT subject must be IT trained/literate at primary level and have appropriate certificate to show for it. – Identify number of users, Identify number of users, validity of certificates and level of knowledge (need for additional education) – Select institutions that will educate/test/certify – Education and certification
Expected outcome:	Define minimum of IT literacy in BiH Harmonization of training programs and evaluation of IT knowledge of teachers of informatics in primary and secondary schools Harmonization of evaluation of IT knowledge and skills with European standards (ECDL or similar). Critical mass of educated teachers of IT subject that will be capable of further educating teachers of other fields in basic ICT knowledge.
Execution period:	Preparations – 12 months; Implementation - permanent
Financial prognosis:	300.000 KM for the first two years, after 100.000 KM annually.
Critical implementation factors	
Funding sources	– Education Ministries – Personal participation of candidate (beneficiary)
Labor market, human resources, necessary knowledge and skills	There are professional human resources potential for the implementation of the entire project. Institutions should be selected through a competition for the most favorable education services.
Development environment	There must be an obligation to certify all teachers of informatics in primary and secondary schools and education of those that do not meet the requirements. Design legislation that will ensure equal competition between providers of education/certification services in the field of ICT ICT capacities must be provided in schools, so that teachers can apply and build on acquired knowledge
Technologies	Appropriate ICT equipment is necessary and additional equipment to support advanced electronic support to education (multimedia)
Time frame	– Preparatory project phase in the first 6 months. – 6 months – selection of education services providers. – After 12months – certification and training of candidates.
Implementation Monitoring	Implementation monitoring will be carried out by the funding party by means of appropriate benchmarks, defined during Project preparation.
Risks	– Absence of set criteria and standards in education for different levels of ICT knowledge. – Poor ICT structure in primary and secondary schools

Type of activity:	Program (PG05)

Title of Activity:	Registry of scientific and research work in BiH
Stakeholder:	National and University Library of BiH
Participants:	– Competent ministries at state, entity and cantonal level – Research and academic network – Universities and other scientific and research institutions
Description of activities:	Establishing national database on scientific and research work
Expected outcome:	Funding guidelines for scientific and research work, Foundations for strategic planning in the science and research field and directing research in fields key to quicker development of BiH Participation in international research projects
Preconditions:	In order for the project to be comprehensive and be successfully implemented, favorable preconditions should be in place for scientific and research work. Successful implementation of projects "Connecting all education and research institutions to Internet," "Establishing sustainable research-academic network"," Enhancing computer capacities in teaching and in scientific and research work ". Defining criteria for evaluation of scientific and research work following similar international arrangements (CRIS)
Execution period:	18 months
Financial prognosis:	250.000 KM – license for DB software, server hardware and OS 300.000 KM – software development 150.000 KM annually – updating information and maintaining software
Critical implementation factors	
Funding sources	Competent ministries must provide initial funds and annual funding while project may partially be self-sustainable by charging services of indexing and evaluating research
Labor market, human resources, necessary knowledge and skills	There is a number of good quality companies in BiH that can develop and maintain software.
Technologies	Project does not require particularly advanced technologies. Sound Internet connection is understood. All components of this system are regulated by standards. International standards will be used to define database structure
Time frame	In the first phase, elements mentioned as the necessary preconditions will be integrated into the uniform support system for set up of Registry. Selected will be software companies that will design database and develop necessary software. In the second phase, data base will be operational and used.
Implementation monitoring	Competent Ministry of Science
Risks	Possible obstructions of project by parties whose positions would directly depend of this system (false references etc.)

Type of activity:	Program (PG06)
Title of Activity:	Accessibility of aggregated databases to education and library system in Bosnia and Herzegovina
Stakeholder:	National and University Library of Bosnia and Herzegovina
Participants:	Academic Network of Bosnia and Herzegovina, Information Society Agency or separate body AIC library consortium. This service must be available under same terms to the entire university and library sector in Bosnia and Herzegovina. Individual users will take advantage of this service via libraries

Description of activities:	Bosnia and Herzegovina needs to be included in (subscribed to) network of leading aggregated bibliographic, factographic and special data bases.	
Expected outcome:	– Using data bases in scientific and research work – Using data bases in education – Proliferation of knowledge – Improving quality of scientific and research work	
Components:	Bibliographic data bases	Both data bases provide access to recent scientific publications, available in short or long types, extract or full text of the article
	Science Citation Index and Current Contents	Specific data bases providing impact factor of scientific articles in terms of level of citation and visibility in the structure of knowledge
	Full text data bases	Data bases providing free search of any segment of the text as such
Preconditions:	User's Internet connection	
Execution period:	Permanent Activity, annually (subscription)	
Financial prognosis:	120.000 KM annually	
Critical implementation factors		
Funding sources	– Science stimulation fund – Higher education institutions' budget (participation) – Library institutions' budget (participation)	
Labor market, human resources, necessary knowledge and skills	In all libraries in BiH, staff should be trained to promote and offer this type of library services to all users.	
Development environment	Create conditions in all libraries to use resources available in project implementation. Provide service users with simple, rapid and comprehensive access to offered resource.	
Technologies	Internet service (authorization and control of access to service)	
Risks	No Internet connection Expensive subscriptions to appropriate services	

Type of activity:	Program (PG07)	
Title of Activity:	LIS/OPAC cooperative system of cataloguing library resources	
Stakeholder:	COBISS in cooperation with library and academic sector	
Participants:	COBISS, independent or libraries part of other institutions, libraries that have their own classical library resources and that want to participate in creating library catalogue and exchange of common computer-based public catalogue	
Description of activities:	Creation, maintenance, exchange and use of jointly created system of data bases on library resources in individual libraries	
Expected outcome:	OPAC catalogue of publicly accessible library resources Proliferation of central catalogue in libraries Availability of search catalogues (Internet service)	
Components:	Consolidation of capacities	Existing capacities are consolidated and new members integrated into the system on annual basis
	Education and licensing	Permanent annual specialist education and licensing of program participants

Preconditions:	– connection of user to Internet – Existence of institution exclusively in charge of administration and system set-up (COBISS) – Existence of joint system (applications program) based on ISO 2709 and Z39.50 – Education and licensing of system members – Free service access to final user
Execution period:	This program is of lasting character, with annual dynamics
Financial prognosis:	200.000 KM annually
Critical implementation factors	
Funding sources	Separate budget for COBISS Center, provided by the Council of Ministers and Entity Governments, participation of integrated libraries
Labor market, human resources, necessary knowledge and skills	Library sector staff has already been sufficiently trained to prepare for and use the system. There is also the necessary IT staff.
Development environment	Serious progress of this program cannot be expected without progress in terms of connecting libraries to Internet, i.e. without development of academic network.
Technologies	Standard ICT technologies, including access to Internet. Today's COBISS system technology must be replaced with new generation in the two years to come at the latest. However, that replacement is not a precondition for implementation and start of system use.
Implementation monitoring	System coordinating agency (COBISS) and Government.
Risks	Potential problems are related to redefining present contracts between COBISS Center and IZUM Institute from Slovenia, i.e. between COBISS Center and participating libraries. Lack of understanding on the part of Council of Ministers and Entity Governments for necessity to provide stable funding.

Type of activity:	Program (PG08)
Title of Activity:	Acquiring, maintaining and using the national ECDL license
Stakeholder:	ECDL BiH Association
Participants:	– Information Society Agency BiH – FBiH and RS Standards and Assessment Agency – Education Ministries and Pedagogic Institutes – OSCE as principal stakeholder - harmonization of education programs
Description of activities:	– Build and enhance the education and test center network for ECDL throughout BiH – Build Association's organization structure with defines powers and responsibilities – Introduce ECDL standard on the BIH market and influence acceptance of ECDL as standard for IT education, by means of appropriate regulations and legislation – Build infrastructure (hardware and software) following ECDL Foundation's requirements – Design standard ECDL literature following ECDL Foundation's requirements – Introduce quality system in the education and test centers as well as ECDL Association in BiH following ECDL Foundation's requirements – Prepare business plan and apply for national license with ECDL Foundation – Integrate ECDL Association of BiH in CEPIS

Expected outcome:	Define minimum of IT literacy in BiH Equalization of training programs and evaluation of IT knowledge and skills - throughout BiH Harmonization of evaluation of IT knowledge and skills with the ECDL European standard. ECDL =European Computer Driving License. Possibility of obtaining European/globally recognized certificates on IT skills for final user, issued in BiH.	
Components:	Defining number of users	Identify number of users, validity of certificates and level of knowledge (need for additional education)
	Defining service providers	Identify parties authorized for education/testing/certification and carry out training/testing/certification of certifying parties
	Resource preparation	Design standard literature for ECDL following ECDL Foundation's requirements and apply for national license with ECDL Foundation
	Training and certification	Implementation
Preconditions:	ECDL Association of IT Professionals of BiH must be registered for at least two years and be a member of CEPIS ECDL Association of IT Professionals of BiH must meet conditions relating to: development of ECDL centers network, number of candidates, maintenance of education and test quality, management and protection of database on candidates and question data base, setting and implementing quality policy, payment of admission membership (10.000 EUR) to the ECDL Foundation. Amend legislation with regard to mandatory certificate as precondition for teaching.	
Execution period:	Preparations – 12 months; implementation - permanent	
Financial prognosis:	Initial investments estimate is around 200.000 KM. Subsequent costs estimated at 15.000 KM/per month.	
Critical implementation factors		
Funding sources	– Annual membership of founder and members of the ECDL Association in BiH – Paying ECDL Association in BiH per every candidate – Implementing projects and tenders the ECDL Association in BiH bids for but members of Association implement – Different grants (BiH Government, large companies BiH, Swedish government etc.)	
Labor market, human resources, necessary knowledge and skills	Existing professional capacities can implement all activities and maintain quality in implementation of ECDL standards in BiH. ECDL Association in BiH and its member organizations with their education and test centers are located in: Sarajevo, Banja Luka, Zenica, Tuzla, Živinice and Bijeljina. Further expansion of the network is planned aiming at country-wide coverage. Activities are ongoing to inaugurate ECDL centers in Mostar, Grude, Bihać, Brčko, Trebinje and Goražde. National strategy to increase IT literacy in BiH should rely on introduction of ECDL standards into curricula, i.e. accepting ECDL standards in evaluation of IT knowledge and skills.	

Development environment	The most significant assistance that the BiH Government can render to the process of obtaining national ECDL license is to urgently adopt appropriate legislation and regulation, to define: – Introduction of ECDL standards as minimum of IT literacy in the curricula and syllabi for IT subject in primary and secondary education – That ECDL standard is basis for evaluation of primary IT knowledge and skills of teachers, civil servant and all citizens in general during recruitment – That ECDL Association in BiH is supported as the stakeholder with regards to obtainment of the national ECDL license. Apart from the aforementioned, ECDL Association in BiH and its network centers will build the market in BiH and promote ECDL standard as the necessary level of IT literacy.
Technologies	Key investment represents: development of applications program for specific purpose, purchase and installation of hardware and software and securing appropriate communications: – Developing applications program for system administration, set-up and access to data base of questions (first access, test results and statistics etc.) – Developing applications program for Data Base of Questions - DBoQ – (multilayer applications program) as well as for ATES- Automated Test Evaluation Systems. – WEB server to set-up Internet presentation of the ECDL Association in BiH with access server containing test questions, demo tests and literature in electronic form – Data Server (File Server) to keep all data bases and server-client applications program for access to data bases of questions – HDSL/ADSL modem for access to ISP, routers and switches to connect Association network – Hardware and software firewall protection and control of access to data bases of data and question – Continuous communication link to ISP (necessary to have rented link 2 Mb/s speed) all test centers (Association members) should use access over Internet to get to server at Association's headquarters. – Design of questions defined by the ECDL Foundation (5 sets of 35 questions for every module) in local language, inclusion of questions into the test system – Design and printing of literature approved by ECDL Foundation
Time frame	· end of 2004 – preparation of business plan, installation of hardware and software, · beginning of 2005 – apply to ECDL Foundation to obtain national license · 2005 – ECDL Foundation Verification and Assessment Team visits to verify whether admission requirements have been met · by end of 2005 - obtainment of national ECDL license; all organization and technical systems operational
Implementation monitoring	Steering Board of the ECDL Association in BiH oversees implementation of planned activities. Control points are defined for specific activities, spanning from end of 2004 to end of project implementation.
Risks	– Insufficiently developed market in BiH to accept ECDL standards. – Insufficient level of cooperation of relevant bodies at Entity and State level with regards to introduction of ECDL standards into the curricula, i.e. accepting ECDL standards in evaluation of IT knowledge and skills. – It is possible that neighboring countries will aspire to spread on the BiH market (Croatia has obtained the national ECDL license, while S&M has yet to obtain it).

Type of activity:	Program (PG09)

Title of Activity:	Digitalization of mobile cultural and historic heritage	
Stakeholder:	Consortium of Institutions involved in the domain of culture and leading libraries	
Participants:	Archive and library institutions and museums in Bosnia and Herzegovina	
Description of activities:	Mass digitalization of the most important resources of mobile cultural and historic heritage of Bosnia and Herzegovina. The following resources will be considered for digitalization: collections of books, magazines, manuscripts then photographs, postcards and similar graphic material, audio and visual material as well as digitalization of their relevant archive material.	
Expected outcome:	Long-term preservation of information about the cultural heritage of Bosnia and Herzegovina. Publicly accessible resources in the form of textual data bases, digitalized data bases.	
Components:	Phase 1	Establishment of consortium of institutions in possession of material.
	Phase 2	Drafting list of priority materials by criteria of state or use.
	Phase 3	Digitalization and post-production of digitalized material.
Execution period:	10 years initially, the best results if this is permanent activity	
Financial prognosis:	2.000.000 KM annually	
Critical implementation factors		
Funding sources	Council of Ministers of BiH, Entity Governments, foreign and national foundations dealing with cultural heritage	
Labor market, human resources, necessary knowledge and skills	There are in BiH all human resources for long-term implementation of this activity.	
Technologies	(digitalization) – standard digitalization technologies, scanning and OCR; standard archiving techniques (post-production) – gateway on the basis of SGML technologies, XML and HTML «on the fly» applications program (use) – standard Internet access	
Time frame	Start of activities in this program must commence as earlier as possible. Today, we are witnessing continued devastation of valuable cultural heritage of BiH.	
Risks	Program will not yield good results unless conducted through a project, that is unless it is appropriately institutionalized.	

7.2. PROJECTS

Type of activity:	Project (PJ01)
Title of Activity:	Designing basics of IT study programs curricula and syllabi in accordance with EU trends
Stakeholder:	Education Ministries All BiH Universities
Participants:	Education Ministries All BiH Universities Consortium of teachers from IT Faculties in Sarajevo, Banja Luka, Tuzla and Mostar as separately organized professional body BHITS Association

Description of activities:	Look at present European trends in this field. Look at previous activities of universities in this regard. In accordance with the aforementioned, define priorities that would provide the biggest benefits under our circumstances. Give separate consistent proposal of cycled study program up to PhD level (Bachelor, Master, and PhD). Jointly define foundations of curricula for ICT field of study.	
Expected outcome:	Adopt curricula for IT field of study in BiH, adjusted to modern trends in Europe and our specific circumstances.	
Components:	Situation analysis	Reliable assessment of situation in the existing curricula and circumstances under which they are implemented. Determine level of review of University curricula.
	Needs analysis	Analysis of the IT labor market and the most necessary knowledge and skills to be included in the curriculum. Accordingly and while following present European trends, consistent concept of multi-cycle program of study should be provided.
	Editing the curriculum	Design of innovated curricula
Preconditions:	Cooperation of all participants, support of state-level institutions. Adoption of the Law on Higher Education.	
Execution period:	9 months	
Financial prognosis:	150.000KM	
Critical implementation factors		
Funding sources	Budget, with use of resources of consortium members. Part of funds should be secured from European grants in this field. TEMPUS 16110-2001 project could provide portion of initial funds for rapid launch of the project.	
Labor market, human resources, necessary knowledge and skills	Teachers at institutions, consortium – members, must be more involved and trained (or trained at the start of the project) to assess the existing and to design future plans.	
Development environment	The necessary legislation is implicit. Promotion of results will be carried through state-level institutions, associations and consortium members. BHITS should be revitalized in order to have field experts work in this project, without political pressure in imposition of concrete solutions	
Technologies	Internet, academic network (state or expanded - regional). EU standard curriculum, IEEE/ACM CC2001 recommendations for IT program of study. Portals with eEducation materials at every IT education institution.	
Time frame	It would be desirable if the project was over by start of the 2005/06 school year.	
Implementation monitoring	Monitoring through project's web page. Success indicators will be the reactions from project results' users through web-based FORUM and IGs (interest groups). In the phase of implementation of project results, success will be measured by monitoring quality of teaching (IT portals at education institutions).	
Risks	Size and non-adjustability of traditional IT/ICT education institutions. If we do not start implementing this project immediately, the necessary corrective measures in the process of results' implementation will be lesser and easier to conduct.	

Type of activity:	Project (PJ02)
Title of Activity:	Launching internationally recognized and indexed scientific ICT magazine
Stakeholder:	One university or faculty in BiH or Association of IT Specialists or Academic and Research Network of BiH
Participants:	– Ministries of Science – co financing the magazine – Universities and other scientific and research institutions – direct users

Description of activities:	In order to compensate for lack of highly qualified professionals in the field of ICT, it is necessary to secure possibility of publishing internationally acclaimed scientific papers – principal measure of quality of scientific and research work. As publication of papers in foreign magazines is very expensive and for the most part out of reach for researchers in BiH, it is necessary to launch a local magazine with high level of quality (strict publishing criteria) and will prefer researches aiming to advance the BiH society.
Expected outcome:	Improving quality of scientific and research work in ICT in BiH Increasing the number of published scientific works of local authors Improving international cooperation – by publishing works of foreign authors
Preconditions:	Establishment of an international review magazine boar that will guarantee high quality of papers published
Execution period:	6 months for preparation, publication 4 times annually
Financial prognosis:	300.000 KM for initial costs to prepare materials (rulebooks, instructions), registration in internationally recognized indexed bases, setting up the editorial board, equipment, organization of co funding of costs for the first eight issues (2 years)
Critical implementation factors	
Funding sources	Initial funding – Ministries of Science and grants The magazine can become self-sustainable in 2-3 years. At the beginning it would require complete funding then partial funding from the Ministry of Science
Labor market, human resources, necessary knowledge and skills	Universities in BiH should support the launch of this magazine by securing contacts for inauguration of the international review board – from among their own professionals and by means of international cooperation
Implementation monitoring	Magazine's editorial board will be selected for a period of 4 years. Magazine's founder will periodically change composition of the review board.
Risks	With time, quality of published papers may lessen. That is why it is of paramount importance to secure a highly professional and responsible editorial and review board.

Type of activity:	Project (PJ03)	
Title of Activity:	Equipping public and school libraries to spread digital literacy	
Stakeholder:	Main public libraries in Cantons and Entities, in cooperation with appropriate education institutions	
Participants:	Public libraries, selected group of school libraries	
Description of activities:	Inside libraries, separate IT offices should be set up containing standard features, internet connection to provide library users with access to search content, evaluate or use internet resources In public libraries, that would be a continued additional service as well as educational activity (courses, seminar workshops) for public library members For school libraries, it would be additional or out-of-school activity coordinated with instruction (IT subject) or librarian's club (out-of-school activity)	
Expected outcome:	– Process of acquiring basic digital literacy in primary and secondary schools should directly reduce the "digital gap" – Increase in use of library resources – Increase in use and in familiarity with electronic resources – Acquisition of specialist skills, e.g. search, navigation, assessment – Creating original electronic content – Coordination and connection with similar activities in the local community	
Components:	Pilot program	10 selected public libraries and 10 selected school libraries that are part of the pilot program.
	Phase 1	Inclusion of all 105 public libraries
	Phase 2	Inclusion of selected libraries at primary and secondary schools.

Preconditions:	Basic IT literacy acquired during schooling
Execution period:	System is parallel with the education system (final years of the primary and throughout secondary school) and it covers the same time period. Defined periods of time are suggested in the case of public libraries.
Financial prognosis:	Pilot phase 500.000 KM First phase 2.500.000 KM Second phase 5.000.000 KM Annual costs of system maintenance, around 1.000.000 KM Costs of Internet connection included in academic network's costs
Critical implementation factors	
Funding sources	– budget (participation) – separate special purpose funds (budget only funds are insufficient) – fond for stimulation of information society development
Labor market, human resources, necessary knowledge and skills	In BiH, there are all the necessary human resources to implement this project.
Technologies	This requires standard internet-based technologies
Time frame	3 years
Implementation monitoring	Information Society Agency Competent Education Ministries Competent Ministries of Culture

Type of activity:	Project (PJ04)
Title of Activity:	Revitalization of BIHARNET into a sustainable research-academic network
Stakeholder:	Information Society Agency BiH (if inaugurated by end of 2004) or BIHARNET Center
Participants:	Council of Ministers of BiH, Government of the Federation of BiH, Republika Srpska Government and competent Cantonal Ministries. All beneficiaries: Universities, schools (primary and secondary), institutes, museums, archives.
Description of activities:	Project will create working conditions for a stable and successful research and academic network, equipped to carry out its primary task. The first phase will incorporate definition of founder's rights, set-up of stable funding sources and efficient management based on such sources. Project will start with revitalization of the BIHARNET network and the following must be done in the shortest time possible: – reactivation of inter-city links and nodes from 2000 – definition and establishment of network's management structure – activation of international link from project SEEREN In that same phase, BIHARNET is to prepare a plan of institutional development for the forthcoming 5 years, to include establishment of necessary human resources for network maintenance, expansion of activities (network should not only be an ISP but carry out other functions too – education, development, consulting) and plan of connecting all academic and research institutions into WAN at state level.

	It is also necessary to do the following: – define permanent funding system (founder's budget, users' membership, donations and international projects,...) – lasting arrangements for inter-city links in technological and economic regard – building network content (EMIS, LIS, institutions' web portals, etc.) Second phase must include intensification of work in the association TERENA, especially through activities at SEREN, CEENet and RIPE. In parallel, revitalized academic and research network will intensify its activities in providing services to users (services must not pertain to ISP only, but include other NREN-common ones– education, development, consulting). All academic and research institutions will be tied in to one WAN. Once a sustainable and stabile WAN BiH is established, it will intensify activities to become part of other regional projects in that field of work.
Expected outcome:	As a direct outcome of the first project phase, inauguration of WAN BiH is expected. WAN BiH will be the primary factor of harmonization and advancement of work lf all academic and research institutions in BiH, in the field of ICT. In the next phase, NREN BiH (BIHARNET) will integrate itself into the pan-European network and appropriate international projects.
Preconditions:	Agreement of the founders of BIHARNET to transfer founders' rights to the state institutions. Readiness of the state institutions to finance such institutions. Inauguration of the Information Society Agency. Progress in the implementation of project titled ″Connecting all education and research institutions to Internet″ is very important for continuation of the project. It is equally important that activities envisaged in project ″Enhancing computer capacities in teaching, scientific and research work″ are successfully implemented. Strictly viewed, these three projects do not represent preconditions to one another. However, they are in tight correlation and complement each other.
Execution period:	As BIHARNET is already part of SEEREN and other international projects securing international links, donations in equipment and other potential capacity-enhancing resources, it is important to start these activities as earlier as possible. 6 months are necessary to deal with issues related to founder and regulate relations with telecoms about inter-city links. Once the inter-city links are established, it will take one year for institutions, BIHARNET users until 2000, to connect to network. By 2010, it is possible to have a sustainable research and academic network of BiH at the level now attained by CARNet and ARNES.
Financial prognosis:	3.000.000 KM annually (in total around 15.000.000 for a 5-year period)
Critical implementation factors	
Funding sources	Experiences of successful NREN in the region confirm that state-level funding sources are necessary: Government of the Federation of BiH, Republika Srpska Government and competent Cantonal Ministries. Funding sources will expand by active involvement in activities of GEANT, DANTE, TERENA, SEEREN, CEENet , RIPE and others. Through European associations and projects, the EU assists in many ways the advancement of those NREN that have not attained the level of developed European NREN, aiming to establish a unique pan-European research and academic network. Portion of costs will be born by institutions – end users, through annual membership fee.
Labor market, human resources, necessary knowledge and skills	As this is a very complex project, there are no complete professional resources in BiH to implement the project in entirety. All professional resources in BiH should associate if we are to successfully implement this project. Experiences of CARNet, ARNES and AMREJ should also be used, with active participation of their professional staff. Particular significance of this project is in the fact that, by involvement in TERENA, SEREN, CEENet, many joint projects, symposia, seminars, workshops will be organized, providing for formation of necessary human resources in BiH. By funding this project, the state will show interest in development of ICT human resources and will contribute to prevention of "brain drain".

Development environment	It is necessary to create all systemic pre-conditions for general acceptance of the project: – Create political consensus on significance of the project for further development of BiH, – Adopt the information society development strategy of BiH. – Inaugurate Information Society Agency – Create basic ICT infrastructure in academic and research institutions, to impose need for their integration into the research and academic WAN BiH.
Technologies	– The existing hardware and software resources would be used in the first year, to inaugurate and start activities of the research and academic WAN BiH, – Particular task in the first year is to identify the hardware and software needed to achieve connection of academic and research WAN BiH with PoP GEANT. As part of SEEREN, analyzed will be advantages and disadvantages of different options in terms of economy, sustainability, time frame, technical and managerial aspect. EU legislation, harmonized in all member countries, will support the necessary procurement.
Time frame	Time frame for execution of this project is of particular importance. This project will have a direct impact on the dynamics and quality of implementation of project titled ″Connecting all academic and research institutions to Internet″. There is also a strong impact in reverse direction. Additionally, SEEREN, CEENet and similar European projects are being implemented while Bosnia and Herzegovina is lagging behind in these activities. There is a danger that these projects might be competed and Bosnia and Herzegovina would not have used the known benefits they offer.
Implementation monitoring	Progress in project implementation will be measured in accordance with proposed indicators P_1-P_5 . Additional indicators will relate to involvement of WAN BiH into the pan-European Association of NREN. TERENA and SEEREN will, as part of their primary activities, monitor progress in project implementation.
Risks	There are several risks that may occur during project implementation. Funding difficulties could be expected. In order to avoid such situations, it is necessary to define from the start what are the responsibilities and rights of all funding parties respectively. Another risk that could be anticipated is running behind similar activities in the region. That is why it is necessary to undertake measures as efficient as possible to urgently launch this project. In case of untimely project implementation, costs will increase and goal implementation will decrease. Third risk is resistance to similar projects that cover the entire BIH. Politicians should be reassured that existence of national network does not hinder local interest and does not impose unitarianism.

Type of activity:	Project (PJ05)
Title of Activity:	Connecting all academic and research institutions to Internet
Stakeholder:	Research and Academic network of BiH
Participants:	Council of Ministers of BiH, FBIH Ministry of Science and Technology, RS Ministry of Science and Technology , Cantonal and Entity Education Ministries, telecom operators and Internet Service Providers, all users: Universities , schools (primary and secondary),institutes, libraries, museums, archives, students dormitories

Description of activities:	Council of Ministers of BiH, Information Society Agency and Research and Academic network of BiH will be the main driving force of activities. Activities need to be undertaken to set as priority the rapid increase of number of academic and research institutions connected to Internet. Costs of Internet connection for these institutions will be considered and resolved at state level. Together with telecom operators and internet service providers, ensured must be access to internet under very favorable prices. We also need to define requirements in terms of quality of access to Internet. As part of this project, we need to find mechanisms to provide to these institutions acceptable mechanisms of access to consulting services about improvement of their own MAN and LAN. We will define separately the mechanisms for stimulation f use of internet in academic and research institutions. Research and Academic network of BiH will be responsible for connections and nodes in towns, while University Computer Centers and similar institutions will perform connections at local level. In the process, they will receive professional staff and technical support from the network.
Expected outcome:	Increase speed and quality of access to Internet with simultaneous decrease of costs. Create preconditions for development and application of ICT in academic and research institutions as well as introduction of new services (access to research data bases, distance education etc.).
Preconditions:	Inauguration of the Information Society Agency and successful implementation of the project titled „Revitalization of BIHARNET into a sustainable research-academic network“
Execution period:	Within five years, all academic and research institutions should be connected to Internet. This is followed by lasting commitment to improve quality of access. It is envisaged that this project will last to 2010, with annual review in accordance with impact achieved and current trends in that milieu.
Financial prognosis:	5.000.000 KM of annual costs, including all project activities (total of 25.000.000 KM for 5 years).
Critical implementation factors	
Funding sources	Initial funds for intensive connection process between 2005 and 2010, to be secured by means of special fund from the FBIH Government, RS Government and cantonal governments. Continues funding is resolved in two ways: – Funding inter-city links is settled through academic and research network funding. – Funding connections at local level is settled by inclusion of budget items of that purpose at universities and education ministries.
Labor market, human resources, necessary knowledge and skills	There are professional human resources in BiH to implement this project.
Development environment	It is necessary to create all systemic preconditions for general acceptance of the project: – Creation of political consensus on the importance of this project for future development of BiH, – Adopt the information society development strategy of BiH. – Inaugurate Information Society Agency – Adopt legislation requiring quality of use of internet in verification of academic and research institutions.
Technologies	We will carry out detailed analysis of economic and technological rationale for use of services of telecom operators or other parties (Elektroprivreda, CIPS) in comparison with development of independent infrastructure. With the aim of cost cuts, all available technologies should be used, including wireless communications, for connections at local level.
Time frame	Project implementation should start as earlier as possible as it a precondition for implementation of many other education-related activities.

Implementation monitoring	Monitoring progress in project implementation will be conducted in accordance with proposed indicators P_1-P_5 . These indicators will be assessed once per year and will be used to make general project implementation assessments.
Risks	Information Society agencies and Research and Academic network of BiH as stakeholders will have determining influence on its success. Main risk factor is possibility that these agencies after their inauguration may not be equipped for successful execution of activities. Previous practice shows that Internet providers see competition in academic networks and therefore attempt to obstruct these activities in different ways. This risk may be avoided through strict rules of network use.

Type of activity:	Project (PJ06)	
Title of Activity:	Enhancing and harmonizing computer capacities in teaching and scientific-research institutions	
Stakeholder:	Information Society Agency	
Participants:	– National Academic and Research Network – BHITS – BiH Association of IT Professionals – Association BAIT, IT companies in BiH, and representation offices of world ICT equipment manufacturers – Institute of Standardization, Measuring, Patents and Intellectual Property of BiH ((BASMP)-Technical Committee – TC1 (Information Technologies) – eLearning Task Force – Service Providers- telecoms and ISP – Education and research institutions(schools, Universities, institutes) – end users	
Description of activities:	Equipping schools/universities with computer equipment, following adopted standards of ICT capacity in academic and research institutions.	
Expected outcome:	Harmonization of ICT capacities, mutual compatibility and harmonization of capacities, increase of quality and degree of education. Improve general literacy of the target group, improve degree of use of ICT capacities in teaching, scientific and research work.	
Components: I PHASE	Definition of strategy	Definition of tasks, dynamics, evaluation; definition of a total of 50 focus schools (primary and secondary), universities and institutes on the basis of public competition.
I PHASE	Project design following strategic guidelines	– software and hardware – maintenance of software and hardware – network – teacher training – administration and management
II PHASE	Equipping focus schools/universities	– equipping focus schools/universities with computer equipment – local network of schools – project-based software development – teacher training – maintenance of software and hardware – administration and management
III PHASE	Equipping 50 new academic and research activities	Same as above.

IV PHASE	Equipping remaining academic and research institutions	Same as above.
Preconditions:	Establishing institution that will be the stakeholder. Adopting standards of ICT capacity in academic and research institutions. Change of tax and customs rates for procurement of computer equipment. Acquisition of special contract on procurement of licensed software and hardware from renowned IT manufacturers.	
Execution period:	18+12+12+72 months, per phase	
Financial prognosis:	200.000 KM (I PHASE), 12.000.000 KM (II PHASE), 8.000.000 KM III (PHASE) 80.000.000 KM IV phase	
Critical implementation factors		
Funding sources	– EU grants – Redirected funds from FIH, RS and cantons' budgets – Funds of schools and universities – Loans (World Bank)	
Labor market, human resources, necessary knowledge and skills	Existing human resources, students and their knowledge and skills, can carry out this part of activities in entirety.	
Development environment	Comprehensive promotion of the project is necessary, especially during fund raining phase. Redirecting funds from government and competent ministry budgets for project implementation. Amending legislation in terms of categorization of schools where ICT readiness will be one of the factors.	
Technologies	– servers – working stations – printers – active and passive network equipment – equipment for presentations – licensed OS, applicative and other software – access to Internet – maintenance of ICT capacities	
Time frame	Immediately after adoption of standards of ICT capacities in teaching, scientific and research work	
Implementation monitoring	Semiannual reports of implementing party. Control points are defined according to the project time frame and project phases. Monitoring of indicators: Number of computers per 100 pupils/students in primary and secondary schools and at Universities Index of quality of computer equipment in the teaching, scientific and research work Using computers in teaching, scientific and research work	
Risks	– Lack of interest on the part of relevant government structures – Inability to find funds – Lack of interest and refusal of further participation in project by end users – Delay in inauguration of the Information Agency Society as the project implementing party – Non-operability of the national academic and research network	

Type of activity:	Project (PJ07)	
Title of Activity:	Standardization of ICT capacities in education and research institutions	
Stakeholder:	Information Society Agency	
Participants:	– BASMP – Technical Committee TC1 (Information Technologies) – National Academic and Research Network – ICT Faculties – BHITS – BIH Association of IT Professionals – Institute of Standardization, Measuring, Patents and Intellectual Property of BIH – Association BAIT, IT companies in BIH, and representative offices of the world ICT equipment manufacturers – BIH eLearning Task Force – Education and research institutions– end users	
Description of activities:	Define norms and recommendations for ICT capacities in terms of hardware configuration, OS, using open source, applicative and educational software, classroom, network capacity, maintenance etc. All recommendations must be based on exact information (e.g. recommendations related to use of open source and proprietary tools must be based on empirically determined fact and clear calculations of costs and benefits, including aspects of use; recommendations on capacity and networking must be based on real needs and realistic options).	
Expected outcome:	Harmonization of ICT capacities, mutual compatibility and harmonization of capacities. Clear recommendations about standardization in terms of use of open source and proprietary mechanisms. Identifying quality instead of price as key criterion in public use.	
Components:	Forming the working group	Forming working group to draft the document. The members should be representatives of the implementing party and participants – high-level professionals in the said field.
	Drafting the document	Drafting the document, harmonization with end users and other participants.
	Publishing the document	Document will be published in relevant media, sent to all academic and research institutions, relevant ministries and Pedagogic Institutes.
	Evaluation	Referential center of the Information Society Agency monitors evaluation
Preconditions:	Establishment of the Information Society Agency. Establishment of the referential central within the Information Society Agency. Amending legislation with regards to categorization of schools/universities, on the basis of their ICT resources.	
Execution period:	6 months for drafting, annual evaluation.	
Financial prognosis:	Estimate for drafting of the first document 200.000 KM Evaluation: 20.000 KM annually.	
Critical implementation factors		
Funding sources	FBIH and RS Governments will design the initial document. During project implementation, defined will be minimum standard project beneficiaries will have to meet in order to be evaluated. That part of project will be covered by project beneficiaries from their own sources.	
Labor market, human resources, necessary knowledge and skills	Existing human resources, their knowledge and skills can implement this project activity in entirety. These are highly qualified professionals, institutions and companies that have already encountered similar difficulties and are capable to give clear definitions of standards in accordance with the EU standards.	

Development environment	For this activity to be implemented, we need to create an environment where schools/universities with better ICT resources will be promoted. This can be achieved by amending legislation in terms of categorization of schools, comprising ICT resources of schools are one of relevant factors.
Time frame	In order to implement other projects and programs that are directly related to standardization of ICT capacities, it is necessary to implement this project by end of 2004.
Implementation monitoring	Monthly working group reports. Benchmarks: 1. Formation of working group, 15 days from project launch 2. Design of first draft 3 months after formation of the working group 3. Harmonization of document with end users and other participants in the program in 17th to 20th week of the project 4. Design of second draft in the 22nd week 5. Adoption and dissemination of document
Risks	– Lack of interest on the part of relevant government structures – Lack of interest or refusal to participate in project on the part of end users Delayed establishment of Information Society Agency as project implementing party

Type of activity:	Project (PJ08)	
Title of Activity:	Development of electronic support to learning (eLearning) at BIH Universities	
Stakeholder:	eLearning Task Force –working group for eLearning in BIH	
Participants:	– Centers /institutes for eLearning – University Computer Centers – National Academic and Research Network – University Academic Staff – Institute of Standardization, Measuring, Patents and Intellectual Property of BIH	
Description of activities:	Introduction and development of electronic support to education at BIH universities.	
Expected outcome:	– Defining eLearning strategy at the level of higher education – Improving quality of education at universities – Providing virtual mobility of students in a credits-based system – Increasing the size and improving the quality of electronically available educational material in mother tongue – Increasing the competitiveness and improving the quality of education content – Increasing the level of attractiveness of study programs in BIH –preventing brain drain	
Components:	Definition of the eLearning strategy of BIH	Creating a working group within BIH eLearning Task Force and drafting the document.
	Harmonization of eLearning strategy	Public discussions about the document at university centers. Harmonization and adoption of the document.

	Establishment at universities of centers for distance education support	Establishing some sort of organized activities in field of distance education at universities (centers/institutes). The centers will aim at providing technological, didactical and organizational support to distance education at universities. Defining standards of hardware and software equipment in the centers.
	Procurement of the necessary equipment for the centers	Procurement of basic hardware and software according to adopted standards, primarily eLearning platform.
	Training of the centers' employees	Training of the centers' employees in the field of available technologies.
	Education and training of teaching staff	General seminars on distance learning. Training of teaching staff aiming to train them in use of eLearning platform and other resources available for development of electronically supported distance learning.
	Development of new eLearning content	Selection of eLearning content development financed out of the project's budget. Public competition at the level of Bosnia and Herzegovina.
	Establishing a fund for continuous financing of the electronic education content development	Establishing a fund for financing the electronic educational content development, which will finance creation of new electronic educational content each year.
	continuing development of the new eLearning content	Selection of the eLearning content development financed out of the Fund's resources. Public competition at the level of Bosnia and Herzegovina once a year.
Preconditions:	– Introduction of legislation in the field of distance learning – Introduction of regulations in the field of evaluation and certification of electronic educational content and programs (quality of eLearning programs and electronic textbooks, evaluation in selection for higher-level teaching titles, etc.) – Regulations in the field of copy rights protection	
Execution period:	2-3 years	
Financial prognosis:	3.000.000 KM	
Critical implementation factors		
Funding sources	– 6th EU Framework Program – Programs of support to higher education at the level of education ministries – higher education fund in BIH	
Labor market, human resources, necessary knowledge and skills	Human resources, capable of implementing this program, were identified through several eLearning programs conducted in Bosnia and Herzegovina. Almost everybody is involved in the work of BIH eLearning Task Force Association.	
Development environment	It is necessary to promote the idea of all universities applying together to the 6th Framework Program of European Union, anticipated to be the main financial source of the program. It is necessary that the national and academic research network functions, as is the access to GEANT network and broadband access of universities to the Internet.	
Technologies	– Servers (web, video, applicative, databases...) – Working stations for the employees of the center – Broadband access to Internet – Web-based platform for distance education – Digital equipment for processing multimedia contents – Equipment for video-conferences – Licensed software	
Time frame	Applying to the 6th Framework program up to December 2004.	

Implementation monitoring	Benchmarks associated to each activity over the period of 2-3 years. Use of indicators: Development of electronically supported distance education at universities
Risks	– Universities not recognizing the role of distance education – Technophobia and lack of interest among the teachers – Incompetent teams at universities – Legal regulations of the centers – Dysfunctional national academic research network – Insufficient number of professionally trained staff – challenging process of developing electronic educational content – Potential "misuse" of distance education - to make the education process cheaper to the detriment of education quality

Type of activity:	Project (PJ09)
Title of Activity:	Preparing Uniform Development platform for EMIS in primary and secondary schools
Stakeholder:	Two Entity Education Ministries
Participants:	Information Society Agency, Cantonal Education Ministries, representatives of primary and secondary schools
Description of activities:	Defining and accepting uniform EMIS development platform for primary and secondary schools.
Expected outcome:	Uniform EMIS development platform for primary and secondary schools. The platform should define: – clear standards that the future software solution must meet, – Open standards for exchange of data, – Joint platform for managing and financing the development and maintenance of EMIS. Apart from using EMIS in schools, the platform also must include the exchange of data i.e. inclusion of the competent ministries and other related institutions (Pedagogic Institutes, Employment Bureaus, etc) into the system. Supported by World Bank, EMIS project should be the basis for preparation of the platform. On the basis of the platform each ministry of education (entity or cantonal) should be able to define a precise project task for development and implementation of a concrete software solution.
Preconditions:	No preconditions. The activity may start immediately.
Execution period:	6 months
Financial prognosis:	Only the costs of development team. Prognosis: 80.000 KM
Critical implementation factors	
Funding sources	Financing directly from the entity ministries of education or by donors' grants, but via the same ministries.
Labor market, human resources, necessary knowledge and skills	There are experts in Bosnia and Herzegovina who are able to prepare the platform.
Development environment	Development team requires access to all ministries of education and schools.
Time frame	This activity should start as soon as possible – not later than beginning of 2005.
Implementation monitoring	Committee composed of representatives of the competent ministries.

Risks	The first risk is selection of an incompetent team. This risk should be decreased by clearly defined project tasks and team members' selection procedure. The second very important risk is rejection of the platform. Even if the platform is not accepted in the first run, the project should continue until the platform acceptable to all ministries is designed.

Type of activity:	Project (PJ10)	
Title of Activity:	Design and implementation of the model EMIS solution for primary and secondary schools	
Stakeholder:	Two Entity Education Ministries	
Participants:	Information Society Agency, Cantonal Education Ministries, representatives of primary and secondary schools	
Description of activities:	On the basis of a uniform EMIS development platform for primary and secondary schools, designed will be a software solution that can be offered under very favorable conditions to all ministries of education and schools in their competence.	
Expected outcome:	Model software solution for EMIS for primary and secondary schools	
Components:	Preparation of a project task	One basis of a uniform EMIS development platform for primary and secondary schools, one will make a detailed project task for software solution. Time: 6 months.
	Construction	Software will be developed in accordance with the project task by the software company chosen in the public competition. Time: 9 months.
	Implementation	Implementation in school and ministries. Signing the contract on maintenance. Time: implementation - 9 months, maintenance – constant.
Preconditions:	An adopted uniform EMIS development platform for primary and secondary schools.	
Execution period:	15 months of preparations; 9 months of implementation	
Financial prognosis:	Preparation of the project task and project management: 150.000 KM Software: 400.000 KM Annual maintenance: 120.000 KM	
Critical implementation factors		
Funding sources	Initial development fund: Council of Ministers through the Information Society Agency Annual maintenance: Education Ministries that accepted the solution.	
Labor market, human resources, necessary knowledge and skills	At universities one can find adequate human resources necessary for the project management and capable of preparing the project task – this staff can start the project even during the process of forming an Information Society Agency. In Bosnia and Herzegovina there are software companies that can implement the project.	
Technologies	In the project task one will insist on the use of top information and communication technologies. Used database management systems must have the top performance and the data exchange protocols must be based on modern communication technologies. Also the access interface must be based on graphic and web technologies, etc.	
Time frame	The project should be started immediately upon adoption of a uniform development platform. If the Information Society Agency is not established by then, one will appoint some of the ministries or some other agency within the Council of Ministers as the stakeholder.	
Implementation monitoring	Committee composed of representatives of the ministry and working group that prepared a uniform development platform.	

Risks	Absence of prepared uniform development platform. Absence of established Information Society Agency. In case that these preconditions are not met, one will start a similar project that will be focused on expanding functions of EMIS developed through a project supported by the World Bank. Wrong choice of the software company. This risk should be decreased to maximum through a precise project task, firm contracts, severe monitoring of the project progress and priory defined terms of the contract for software maintenance.

Type of activity:	Project (PJ11)
Title of Activity:	Preparation of a uniform development platform for University EMIS
Stakeholder:	Consortium of all Universities in BIH
Participants:	Information Society Agency, Education Ministries at all levels
Description of activities:	Defining and accepting a uniform development platform of university EMIS.
Expected outcome:	Uniform development platform of university EMIS. The platform should define: – A clear standards that the future software solution must meet, – Open standards for data exchange, Apart from using EMIS at universities, the platform must also include the exchange of data i.e. inclusion of the competent ministries and other related institutions (Pedagogic Institutes, Employment Bureaus, etc) into the system. The basis for platform preparation should be: - Manner in which university EMIS function in EU countries, - Current functioning systems, - Current projects of university EMIS development (primarily project of the Sarajevo University supported by the World Bank) – On basis of the platform, each university involved should be able to define a precise project task for independent development and implementation of a concrete software solution.
Preconditions:	No preconditions. The activity may be started immediately.
Execution period:	6 months
Financial prognosis:	Only costs of the development team. Prognosis: 80.000 KM
Critical implementation factors	
Funding sources	Direct financing by the university.
Labor market, human resources, necessary knowledge and skills	At BIH Universities there are experts capable of preparing the platform.
Development environment	Development team should be provided access to all universities.
Time frame	This activity should be started as soon as possible – not later than beginning of 2005.
Implementation monitoring	Committee composed of representatives of all universities involved.
Risks	The first risk is related to potential choice of an incompetent team. This risk should be decreased by a clearly established project task and clearly defined procedure for selection of the team members. The second risk is rejection of the platform. One should not insist on this one. If the platform is rejected by most universities, one should continue with the project and make efforts to create a platform acceptable to majority of universities.

Type of activity:	Project (PJ12)	
Title of Activity:	Construction and implementation of model university EMIS	
Stakeholder:	Consortium of Universities interested in joint development of EMIS	
Participants:	Competent Education Ministries	
Description of activities:	On basis of a uniform development platform of university EMIS one should construct a specific software solution that will apply to interested universities.	
Expected outcome:	Model software solution for university EMIS.	
Components:	Preparation of the project task	On basis of a uniform development platform for university EMIS it is necessary to make a detailed project task for software solution. Time: 6 months.
	Construction	In accordance with project task, software is to be developed by the software company selected through public competition. Time: 9 months.
	Implementation	Implementation at interested universities. Signing of a maintenance contract. Time: Implementation - 9 months, maintenance – continuous.
Preconditions:	An adopted uniform development platform of university EMIS. At least two universities interested in joint development.	
Execution period:	15 months of preparation; 9 months of implementation	
Financial prognosis:	Preparation of the project task and project management: 150.000 KM Software: 600.000 KM Annual maintenance: 60.000 KM per university.	
Critical implementation factors		
Funding sources	Initial development fund: Universities . Additionally, grant or favorable loan granted by the international development agencies. Annual maintenance: Universities .	
Labor market, human resources, necessary knowledge and skills	At BIH Universities there are experts able of managing the project and preparing the platform. In Bosnia and Herzegovina there are software companies that can implement the project.	
Technologies	In the project task one will insist on the use of top information and communication technologies. Used database management software (DBMS) must have the top performance and the data exchange protocols must be based on modern communication technologies. Also the access interface must be based on graphic and web technologies, etc.	
Time frame	The project should be started immediately upon adoption of the uniform development platform.	
Implementation monitoring	Committee composed of representatives of the universities involved.	
Risks	Lack of a prepared uniform development platform. In case this condition is not met, it is not necessary to start the project. The development efforts will continue at individual universities. Wrong choice of the software company. This risk should be entirely eliminated through a precise project task, well defined contracts, strict monitoring of the project progress and previously defined terms of software maintenance contract.	

Type of activity:	Project (PJ13)
Title of Activity:	Set-up of database and applicative software for external evaluation of knowledge in primary and secondary schools
Stakeholder:	Standards and Assessments Agency

Participants:	Standards and Assessments Agency, Curriculum Agency, Ministries of Science and Education Pedagogic Institute
Description of activities:	Introduction of system for external evaluation of knowledge upon completion of primary and secondary school. Ultimately, each school should have resources enabling students to answer questions on a computer in a group of subjects. For each subject there will be a large enough database of questions. These databases will be public in order to increase the transparency of the process itself.
Expected outcome:	Standardization of the evaluation system which should contribute to decrease/abolishment of admission exams for secondary school and universities.
Preconditions:	Training of employees in agencies, ministries and pedagogic institutes
Execution period:	Preparation – 12 months, implementation depends on the pace of school equipping
Financial prognosis:	Preparation of software: 120.000 KM Maintenance of database: 60.000 KM annually Annual evaluation of knowledge: within permanent school activities
Critical implementation factors	
Funding sources	Education Ministries at all levels.
Labor market, human resources, necessary knowledge and skills	In Bosnia and Herzegovina there are the necessary human resources for all phases of development.
Technologies	Use of web technology providing use of "distance" database is mandatory.
Implementation monitoring	Education Ministries.
Risks	Disagreement regarding manner of examining and content of database. Ministries must continue building and maintaining consensus in this regard. Wrong choice of the software company. This risk should be entirely eliminated through a precise project task, well defined contracts, strict monitoring of the project's progress and previously defined terms of software maintenance contract.

Type of activity:	Project (PJ14)	
Title of Activity:	Standardization of IT syllabus for secondary vocational schools and elective teaching in information science in general secondary schools (gymnasiums)	
Stakeholder:	Curriculum Agency	
Participants:	Standards and Assessments Agency, Ministries of Science and Education, Pedagogic Institute	
Description of activities:	Forming an external team, which will together with Pedagogic Institute consider the possibility of implementation of existing licensed programs in certain IT areas and their implementation in programs of secondary vocational schools i.e. informatics as elective subject in entire BIH.	
Expected outcome:	Standardization of teaching programs in secondary vocational schools, standardization of elective teaching, standardization of teaching materials, better preparation	
Components:	Forming of an external team	The team would, in collaboration with the Pedagogic Institute consider the possibility of taking over one or more existing education programs (if possible licensed ones) applicable to secondary vocational schools and program of electives
	Training of teachers of electives	For selected programs it is necessary to organize the teachers' training, but the teachers will be given the possibility to choose the preferred among several offered education programs.
	Creation of the teaching materials	Paying attention to copy rights and in agreement with the author of the program, commence adjustment or translation of teaching materials into languages of BIH.

	Evaluation	Evaluation of results the students and teachers achieved, but also continuous evaluation of programs to be offered in the future.
Preconditions:	This activity requires an approval of the competent ministries	
Execution period:	2 years	
Financial prognosis:	400.000 KM	
Critical implementation factors		
Funding sources	The activities will be funded out of the budget of Ministry of Education and donations	
Labor market, human resources, necessary knowledge and skills	Using the local human resources all the activities can be completely enforced.	
Development environment	It is necessary to develop a positive climate among the teachers of informatics so that they accept this initiative as something that will primarily facilitate their work	
Time frame	The project should start as soon as possible, maybe even as of next school year, in order to utilize the positive experiences of pilot projects in some secondary schools	
Implementation monitoring	Standards and Assessments Agency is to prepare the annual reports	
Risks	– Lack of interest among relevant government structures – Lack of interest among the teachers or refusal to participate in the project	

7.3. INITIATIVES

Type of activity:	Initiative (IN01)	
Title of Activity:	Promotion of Open Source (OP) standard operation systems and applications at education and other public institutions	
Stakeholder:	LUG (Linux Association of Citizens)	
Participants:	Ministry of education, science and technology Ministry of communications; BHITS Association	
Description of activities:	Promoting utilization of Open Source (OS) software and training of teams in consulting about OS operation systems and applications.	
Expected outcome:	Increased level of understanding for OS solutions, which at the moment represents an alternative to the currently dominant proprietary solutions. Increase in number of experts able to offer consulting regarding the application of OS solutions.	
Components:	Promotion	Continuous work on promotion of OS solutions. Promotional activities through seminars, conferences, information announced in media, etc.
	Education	Free education for support teams in public institutions through short seminars in implementation and utilization of OS solutions.
	Other	Identification of selected tools and recommendations for implementation.
Preconditions:	There are no particular preconditions. Realization of the initiative can start as soon as at least one part of funding is obtained.	
Execution period:	Permanent activity	
Financial prognosis:	150.000 KM a year	
Critical implementation factors		

Funding sources	Initial funding from the ministries of education and ministries of communications. Additional funding through a fund that will partly be filled by the ministries and partly by the companies interested in promoting OS solutions.
Labor market, human resources, necessary knowledge and skills	Linux Association of Citizens (LUG) has a critical mass of human resources to launch the project.
Time frame	There is no critical timeframe. In period of 2005-2010, the initiative has a permanent character, and should therefore start as soon as possible.
Implementation monitoring	Very clear financial effects and strategic equipping of the institutions and infrastructure.
Risks	Lack of understanding for strategic need for promoting OS solutions and providing free training for institutions.

Type of activity:	Initiative (IN02)	
Title of Activity:	Popularization of ICT use in education	
Stakeholder:	Association of IT Professionals in BIH	
Participants:	Media, electronic media in the first place (TV, radio, e-zines) INFO and MOBiH magazines, as well as similar information science magazines in BIH Academic and Research Network of BIH Primary and secondary schools and faculties	
Description of activities:	Promotion and popularization of ICT in education can be carried out through several different activities and competitions.	
Expected outcome:	Increase of general digital literacy Increase of the number of ICT users Increase in quality of service level in area of ICT for the needs of academic institutions Creating and enhancing international trust Building awareness among young people and a sense that BIH offers them a future.	
Components:	Competition for the best web site of a school or faculty	Following the competition "Better School Web", organized in 2003 by OSCE and INFO magazine, the same should be organized each year. The aim is to encourage through the competition improvement in quality of the web presentations in schools and faculties.
	Funding of the small projects in field of ICT	By establishing a fund for small ICT projects, one will promote creativity of students and teachers.
	Organizing summer and winter schools of informatics	The schools would be organized in the tourist-promoted places in BIH, while lessons would be provided by both local and foreign lecturers. Talented students would have the opportunity to attend advanced courses in the field of ICT.
Preconditions:	An active and uniform association of IT Professionals of BiH	
Execution period:	Permanent activity The components would be proportionally scheduled over the year and harmonized with school attendance of participants.	
Financial prognosis:	50.000 KM a year – organization of the competition for the best web site 100.000 KM a year – Fund for small ICT projects (20 projects a year) 50.000 KM a year – summer / winter school of informatics	
Critical implementation factors		

Funding sources	Education Ministries – financing party Information companies from BIH – sponsors of the competition and activities BIH Internet service providers - sponsors of the competition and activities Tourist communities – sponsors aiming to promote BiH tourism
Labor market, human resources, necessary knowledge and skills	Organization body should include the young, creative and communicative people who will not only prevent this competition of becoming a routine one but make it more interesting and of better quality each year.
Risks	Loss of interest among the participants because of poor organization

8. MONITORING OF INFORMATION SOCIETY DEVELOPMENT (BENCHMARK PROCESS)

Definition of the indicator (I1x):	It divides the computer users within population with the focus on the groups (subpopulation) that are particularly important for the analysis of digital literacy by certain aspects. I1x=(Number of computer users in subpopulation x/total subpopulation x)*100 I1x is percentage of computer users in subpopulation x. Subpopulation x is defined according to some of the following criteria: – Gender – Age – Age at which a person completed education in a regular public education system – Income lower than the average national income – Age at which a person adopted ICT The criteria will be specified and supplemented in accordance with the needs and changes in the field of ICT in BIH.
Importance of the indicator:	The indicator is important for a continuing monitoring of "digital gap" as well as for success of "digital literacy education process".
Sources of information:	Information Society Agency, other independent research agencies
Data collection:	The data are collected in form of answers to the question: Have you used computer for private or business purposes over the past 4 weeks? – Yes – No – I do not know
Incidence:	Once a year
Correlated indicators:	
Indicator Weight Factor:	3
Indicator validity:	3
Indicator availability:	2

Indicator definition (I2x):	It divides the Internet users within population with focus on groups (subpopulations) that are of particular importance for digital literacy analysis by certain aspects. I2x=(Number of Internet uses within subpopulation x/total subpopulation x)*100 I2x is the percentage of Internet users within subpopulation x. The subpopulation x I1x.
Importance of the indicator:	The indicator is important for a continuing monitoring of "digital gap" as well as for success of "digital literacy education process".
Sources of information:	Information Society Agency, other independent research agencies

Data collection:	The data are collected in a form of answers to the question: Have you used Internet at least once either from home, office or any other place over the past 4 weeks? – Yes – No – I do not know
Incidence:	Once a year
Correlated indicators:	
Indicator Weight Factor:	3
Indicator validity:	3
Indicator availability:	2

Indicator definition (I3x):	It divides Internet users who access Internet from home within population with focus on groups (subpopulations that are of particular importance for digital literacy analysis by certain aspects. I3x=(Number of Internet users who access Internet from home within population x/total subpopulation x)*100 I3x is the percentage of Internet users who access Internet from home within subpopulation x. The subpopulation x is defined in accordance with some of the criteria set for I1x.
Importance of the indicator:	The indicator is important for a continuing monitoring of "digital gap" as well as for success of "digital literacy education process".
Sources of information:	Information Society Agency, other independent research agencies
Data collection:	The date is collected in a form of answers to the question: Do you have access to Internet from home? – Yes – No – I do not know
Incidence:	Once a year
Correlated indicators:	
Indicator Weight Factor:	3
Indicator validity:	3
Indicator availability:	2

Indicator definition (I123):	Index of the «digital gap» (DIDIX). The index measures the digital gap by measuring the progress of so-called "risk groups". This index includes indexes for access to Internet, use of the Internet and use of computers. The «risk groups» are differentiated by gender, age, level of education and income, and they include: – Female population – Population of age 50 and over – Persons who previously completed formal education (at age 15 or earlier) – Persons with income lower than the average national income DIDIX is result of the index sum divided by the number of « risk groups » $(1)\ DIDIX = \frac{1}{n}\sum_{i=1}^{n} D_i$ and each sub index is calculated according to formula $(2)\ D_i = \sum_{j=1}^{m} w_j * \frac{p_{ij}}{p_j}$ where: wj – measure of the indicator pij – value of the indicator j in the «risk group» and (i=1,..,n) pj – value of the indicator j for the entire population i risk group j Indicator Measure 1 Over age 49 1 Use of computers 0.50 2 Female population 2 use of Internet 0.30 3 Persons who completed formal education before age of 16 3 Number of Internet users who have home connection 0.20 4 Low income n=4, m=3 The sum of aforementioned figures is given in the following formula: $Didix = \frac{1}{n}\sum_{i}^{n} \sum_{j}^{m} \omega * \frac{P_{ij}}{P_j}$
Importance of the indicator:	The index follows the state of "digital gap" of a certain country
Source of information:	Information Society Agency, other independent research agencies
Data collection:	The data are collected in a form of answers to the question: – Have you used any computer for business or private purposes over the past 4 weeks – Have you used Internet for any location (home, school, job) over the past 4 weeks – Do you have an access to Internet from home
Incidence:	Once a year
Correlated indicators:	
Indicator Weight Factor:	3

Indicator validity:	3
Indicator availability:	2

Indicator definition (I4x):	It divides persons within population that have been using the Internet for over two years, with the focus on the groups (subpopulation) that are particularly important for the analysis of digital literacy by certain aspects. I4x=(Number of persons within subpopulation X who use the Internet for over two years / total subpopulation X)*100 I4x is percentage of persons within subpopulation X who have been using the internet for over two years. The subpopulation X is defined upon some of the criteria set forth for I1x.
Importance of the indicator:	The indicator shows the development level of the information society as whole. Persons who use the Internet for over two years are more likely to use different on-line services and perform on-line transactions. These users will easily replace home dial-up or some other connection with the broadband access.
Source of information:	Information Society Agency and other independent research agencies.
Data collection:	The data are collected in a form of answers to the question: When was the first time you used the Internet? – Less than six months ago – Between 6 and 12 months – A year or two ago – Less than two years ago – I do not know
Incidence:	Annually
Correlated indicators:	
Indicator Weight Factor	2
Indicator validity:	1
Indicator availability:	2

Indicator definition (I5x):	It divides the Internet users within population who spend over 6 hours a week surfing on the Internet with the focus on the groups (subpopulations) that are particularly important for the analysis of digital literacy by certain aspects. I5x=(Number of the Internet users within subpopulation X who spend over 6 hours a week surfing on the Internet / total subpopulation x)*100 I5x is percentage of the Internet users within subpopulation X who have the home access to the Internet. The subpopulation X is defined upon some of the criteria set for I1x.
Importance of the indicator:	The indicator is important for identifying the potential users of the home broadband access to Internet.
Source of information:	Information Society Agency and other independent research agencies

Data collection:	The data are collected in a form of answers to the question: How many hours a week do you spend surfing on the Internet? – Over six hours a week – Between 1 and 5 hours a week – Less than an hour a week
Incidence:	Annually
Correlated indicators:	
Indicator Weight Factor	2
Indicator validity:	1
Indicator availability:	2

Indicator definition (I6):	Communication via e-mail The index measures increase in number of internet users who communicate via e-mail with at least one fourth of their friends and acquaintances The Index is calculated upon the formula: $I6 = \frac{\sum_{1}^{j} EUI}{\sum PEU} * 100$ Where: EUI – incidence of e-mail usage for communication with friends and acquaintances EU1 – users who communicate with their friends and acquaintances via e-mail EU2 – users who communicate with ¾ of their friends and acquaintances via e-mail EU3 – users who communicate with ½ of their friends and acquaintances via e-mail EU4 – users who communicate with ¼ of their friends and acquaintances via e-mail PEU – Total population using e-mail
Importance of the indicator:	The indicator shows to what extent the usage of e-mail technology made an impact on social contacts of the users themselves.
Source of information:	Information Society Agency and other independent research agencies
Data collection:	The data are collected in a form of answers to the question: How many friends and acquaintances do you communicate with via e-mail? – With almost all of them – With about 2/3 – With about 1/2 – With about 1/4 – With only few friends and acquaintances – I do not know
Incidence:	Annually
Correlated indicators:	
Indicator Weight Factor	2
Indicator validity:	2
Indicator availability:	3

Indicator definition (I7):	Possibility of potential creation of on-line contents The indicator shows how many Internet users have enough knowledge and resources to create the on-line content and how many of them feel capable of doing so. $I7 = \frac{\sum IUwpcc}{\sum PiU} * 100$ IUwpcc is the number of Internet users who feel capable to create the on-line content. PIU – Total number of the Internet users.
Importance of the indicator:	This indicator, in a slightly modified form than the one suggested by SIBIS (which considers the broadband access from home) can be used to show the desire for an active participation in the knowledge society. The indicator can be modified for the teachers and expert associates in schools aiming to develop electronic content in the syllabi for certain fields of study.
Source of information:	Information Society Agency and other independent research agencies
Data collection:	The data are collected in a form of answers to the question: Do you have enough knowledge to publish the information on-line? – Yes – No – I do not know
Incidence:	Annually
Correlated indicators:	
Indicator Weight Factor	2
Indicator validity:	2
Indicator availability:	2

Indicator definition (I8):	Participation in ICT training I8=(Total number working-age persons who attended some sort of the ICT training over the past 12 months /Total working-age population)*100
Importance of the indicator:	The indicator measures to what extent the employers, and employees and unemployed persons invest in the ICT education. The indicator is important for the life-long education.
Source of information:	The employment bureaus, Information Society Agency, other independent research agencies.
Data collection:	The data are collected in a form of answers to the question: (For employed persons): Have you attended any kind of ICT training over the past 12 months that was organized by your company or some other organization? (For unemployed persons): Have you attended any kind of ICT training over the past 12 months that was organized by a public institution or any other organization? Alternatively, one can the following question: Have you attended any kind of ICT training in …? – The past 12 months – The period longer than a year – I never attended any ICT training
Incidence:	Annually

Correlated indicators:	
Indicator Weight Factor	3
Indicator validity:	2
Indicator availability:	1

Indicator definition (I9):	Percentage of ICT studies harmonized with EU standards (The Bologna Declaration and ECTS) I9=(Number of ICT studies harmonized with EU standards / Number of ICT studies in BIH) *100
Importance of the indicator:	The indicator shows to what degree the institutions of higher education are harmonized with EU standards in the field of ICT. In the short-term, this indicator should be interpreted as the indicator of transition achieved, while in the long-term this indicator should be interpreted as the level of the education system compatibility. This indicator is important for tracking the information society development as it shows the level of modernity of the ICT curriculum in BIH.
Source of information:	All institutions of higher education in the field of ICT will be taken as the source of information on basis of which one can determine the indicator. The manner in which the information will be collected will be determined by the AGENCY in collaboration with the budget users.
Data collection:	Through centralized monitoring of curriculum development, one will specifically explain the needs for deviation from EU standards in education. Preliminary researches are already conducted within the project Tempus 16110-2001 and the results clearly show the necessity for collection of such data.
Incidence:	The indicator should be calculated annually, at the beginning of the school year. Annual analysis should correct the possible deviations from the plan.
Correlated indicators:	The indicator correlating with this one is the indicator showing the degree to what the higher education institutions are equipped to meet the EU teaching quality standards. This correlation is very important because better education cuts down the technology import!
Indicator Weight Factor	4
Indicator validity:	4
Indicator availability:	4

Indicator definition (I10):	Use of ICT in teaching process, presentation of the students' term papers, seminar and secondary school graduation papers I10=(Number of classes in which ICT was used in teaching process during a school year /total number of classes in a school year)*100
Importance of the indicator:	The indicator shows to what extent the use of digital content in teaching process has been increased.
Source of information:	a school, Pedagogic Institute, Ministries of Science and Education

Data collection:	The data are collected in a form of answers to the question At how many classes in a school year do you use digital content? In other words, to what extent the students use ICT in presenting their term papers, seminar and secondary school graduation papers? – Very often (in more than 20 classes a year) – Often (15-20 classes a year) – Sometimes (10-15 classes a year) – Rarely (5-10 classes a year) – Very rarely (up to 5 classes a year) – I do not use ICT in teaching process
Incidence:	At the end of each school year
Correlated indicators:	Use of computers in teaching and scientific and research work Computer equipment quality index in teaching and scientific and research work Number of computers per 100 students in primary, secondary schools and universities
Indicator Weight Factor	4
Indicator validity:	4
Indicator availability:	3

Indicator definition (I11):	Increase of CD-ROM contents in approved textbooks How many approved textbooks for all teaching areas have an accompanying multimedia CD-ROM I11=(Number of approved textbooks accompanied by a CD ROM / total number of approved textbooks)
Importance of the indicator:	The indicator shows the extent of e-learning content in teaching process
Source of information:	Ministry of Science and Education
Data collection:	Collection is carried out through the insight into the textbook content
Incidence:	At the beginning of each school year
Correlated indicators:	
Indicator Weight Factor	3
Indicator validity:	3
Indicator availability:	3

Indicator definition (I12):	Number of the Internet users who know how to find the source of desired information on the Internet I12=(Number of the Internet users who know how to find the source of desired information on the Internet / Total number of the Internet users)*100
Importance of the indicator:	Using the Internet, we often need to make selection between different sources of information. This parameter is important because prior to evaluation of the information one should take into account the reliability of the source itself. This too is one of the skills appertaining to digital literacy.

Source of information:	Information Society Agency and other independent research agencies
Data collection:	The data are collected in a form of answers to the question To what extent do you feel competent to identify the source of information you found on the Internet? – I feel completely competent – I feel pretty competent – I do not feel competent – I do not understand the question – I do not know
Incidence:	Annually
Correlated indicators:	
Indicator Weight Factor	3
Indicator validity:	1
Indicator availability:	1

Indicator definition (I13):	Number of the Internet users who know how to use search engines on the Internet I13=(Number of the Internet users who know how to use search engines on the Internet)*100
Importance of the indicator:	This skill is the part of digital literacy definition. Given the fact that there is a lot of information placed on the Internet, the user must be aware of ways of using search engines (e.g. using the search operators) in order to find the right information.
Source of information:	Information Society Agency and other independent research agencies
Data collection:	The data are collected in a form of answers to the question: To what extent do you feel competent to find the information about the topic that you are interested in? – I feel completely competent – I feel pretty competent – I do not feel competent – I do not understand the question – I do not know The question can be rephrased as: To what extent do you feel competent to use some search engines (e.g. Google) to find the information about the topic that you are interested in?
Incidence:	Annually
Correlated indicators:	
Indicator Weight Factor:	2
Indicator validity:	1
Indicator availability:	1

Indicator definition (I14):	Number of persons who feel competent to communicate via Internet by using at least one of the following three Internet media: – Using e-mail – Using communication service in real time (IRC-CHAT) – Creating own website $R_{vcom} = 1$ if $c_i = 1 \cap c_j = 1 \cap c_k = 1$ $\quad c_{i,j,k} \in [1;5]$, $R_{vcom} \in [0;1]$ $R_{vcom} = 0$ if $c_{i,j,k} \neq 1$ The indicator is calculated upon formula: $C_{vcom} = \frac{\sum R_{vcom}}{\sum R} * 100$ where: R – total population ci - level of e-mail usage cj - Level of chat usage ck - possibility of creating website Rvcom – total number of answers in which the respondents stated that they feel totally qualified to communicate via Internet Cvcom – number of answers in which the respondents stated that they feel totally qualified to communicate via Internet I14=(Number of persons who feel competent to communicate via Internet is result of the positive answers in at least one of the categories divided by the total population.
Importance of the indicator:	Possibility of communicating via Internet is a necessary precondition for use of the information society potential. Possibility of communicating via Internet is one of the skills appertaining to basic digital literacy.
Source of information:	Information Society Agency and other independent research agencies
Data collection:	The data are collected in a form of answers to the question: To what extent do you feel competent to use the following Internet services: – E-mail – Using communication service in real time (IRC-CHAT) – Creating own website Answers: – I feel completely competent – I feel pretty competent – I do not feel competent – I do not understand the question – I do not know The question can be rephrased as: To what extent do you feel competent to use some of the Internet search engines (e.g. Google) to find the information about the topic that you are interested in?
Incidence:	Annually
Correlated indicators:	
Indicator Weight Factor:	3
Indicator validity:	1
Indicator availability:	1

Indicator definition (I15):	SCI equivalent at the level of Bosnia and Herzegovina (I15)=(is calculated in analogue manner according to the international SCI index for scientific and research work)
Importance of the indicator:	The indicator shows the relevance of scientific researches. The data would be used, for example, by universities for the purpose of promotion (academic title) as well as by all those who raise funds for financing research projects in order to evaluate competence of the project participants.
Source of information:	Source of information would be a unique information system of the scientific and research work
Data collection:	Magazines and conferences would provide information for that information system.
Incidence:	The incidence is calculated at least once a month, but when possible it should be calculated on a daily basis.
Correlated indicators:	
Indicator Weight Factor:	5
Indicator validity:	4
Indicator availability:	4

Indicator definition (I16):	Computers with access to LAN I16=(Number of computers with access to LAN / total number of computers) *100
Importance of the indicator:	The indicator shows the degree of computer connection within an institution. It also shows the readiness of the institution to use of all benefits that come along with the connection to the global network – Internet.
Source of information:	– Academic institutions – Research institutions – Libraries – Museums – Archives
Data collection:	The data are collected in a form of answers to the questions: – Total number of computers possessed by the institution? – Number of computers with access to LAN institutions? The data could be acquired simply from the institution expert services. The obligation can be prescribed by the Information Society Agency.
Incidence:	Once a year because no significant changes are anticipated over the shorter period of time.
Correlated indicators:	This is the «basic» indicator because it shows the internal connection within the institutions.
Indicator Weight Factor:	4
Indicator validity:	4
Indicator availability:	4

Indicator definition (I17):	Number of computers with Internet access I17= (Number of computers with access to Internet / total number of computers) *100
Importance of the indicator:	The indicator shows the level of computer connection to the Internet. This is a very important indicator because it shows to what degree the institution is involved in the contemporary trends related to information.
Source of information:	– Academic institutions – Research institutions – Libraries – Museums – Archives
Data collection:	The data are collected in a form of answers to the questions: – Total number of computers possessed by the institution? – Number of computers with Internet access? The data could be acquired simply from the institution expert services. The obligation can be prescribed by the Information Society Agency.
Incidence:	Once a year because no significant changes are anticipated over the shorter period of time.
Correlated indicators:	This indicator correlates with indicator P1 (computers with access to LAN) because they together show the state of institution connection.
Indicator Weight Factor:	4
Indicator validity:	4
Indicator availability:	4

Indicator definition (I18):	Number of teachers/employees who have their own e-mail address I18= (Number of teachers/employees who have their own e-mail address / total number of teachers / employees) *100
Importance of the indicator:	The indicator shows to what extent the teachers / employees use e-mail service. This is a very important indicator because it shows readiness of teachers / employees to use different Internet services.
Source of information:	– Academic institutions – Research institutions – Libraries – Museums – Archives
Data collection:	The data are collected in a form of answers to the questions: – Total number of teachers / employees in the institution? – Number of teachers / employees who have their own e-mail address? The data could be acquired simply from the institution expert services and/or by interviewing the teachers/employees. The obligation can be prescribed by the Information Society Agency.
Incidence:	Once a year because no significant changes are anticipated over the shorter period of time.
Correlated indicators:	This indicator correlates with indicator P2 (computers with access to Internet) because together they show to what extent the teachers / employees use Internet access.
Indicator Weight Factor:	4
Indicator validity:	3

Indicator availability:	3

Indicator definition (I19):	Number of pupils/students who have their own e-mail address I19= (Number of pupils/students who have their own e-mail address / total number of the pupils / students) *100
Importance of the indicator:	The indicator shows to what extent the pupils/students use e-mail service. This is a very important indicator because it shows the readiness of the pupils / students to use different Internet services.
Source of information:	– Academic institutions – Research institutions – Libraries – Museums – Archives
Data collection:	The data are collected in a form of answers to the questions: – Total number of pupils / students in institution? – Number of pupils / students who have their own e-mail address? The data could be acquired simply from the institution expert services and/or by interviewing the pupils / students. The obligation can be prescribed by the Information Society Agency.
Incidence:	Once a year because no significant changes are anticipated over the shorter period of time.
Correlated indicators:	This indicator correlates with indicator P2 (computers with access to Internet) because together they show to what extent the pupils / students use Internet access.
Indicator Weight Factor:	4
Indicator validity:	3
Indicator availability:	3

Indicator definition (I20):	Access speed by computer connected to Internet I20= Connection speed of the institutions connected to Internet / total number of computers connected to Internet
Importance of the indicator:	The indicator shows the quality of institution connection to the Internet. This is an important indicator because it shows the connection speed of the institution network computers to the Internet.
Source of information:	– Academic institutions – Research institutions – Libraries – Museums – Archives
Data collection:	The data are collected in a form of answers to the questions: – Speed of the institution's Internet connection? – Total number of computers in the institution connected to Internet? The data could be acquired simply from the institution expert services. The obligation can be prescribed by the Information Society Agency.
Incidence:	Once a year because no significant changes are anticipated over the shorter period of time.

Correlated indicators:	This indicator correlates with indicators P2 (number of computers with access to internet), P3 (number of teachers/employees who have their own e-mail addresses) and P4 (number of pupils / students who have their own e-mail addresses). Aforementioned indicators show the dependence of Internet connection quality, accessibility of the connection to every individual and interest for using such connection. This indicator should correlate with the other indicators too.
Indicator Weight Factor:	4
Indicator validity:	4
Indicator availability:	4

Indicator definition (I21):	Use of computers in teaching process and scientific and research work I21=(number of participants who use computers in teaching process and scientific and research work / scientific and research work)*100
Importance of the indicator:	This indicator is important because it shows to what degree the computers are used in teaching process and scientific and research work. That is the area that represents driving force of a country.
Source of information:	– Schools – Faculties – Universities – Institutes – Other research institutions and companies The data are collected in a form of answers to the question.
Data collection:	The data are collected in a form of answers to the question: <u>Primary and secondary schools, universities</u> Have you used computer in teaching process over the past four weeks? – Yes – No – I do not know If not, why not? – Lack of equipment – Insufficient quality of the equipment – Other (please, state the reason) <u>Universities</u> Have you used computer in scientific and research work over the past four weeks? – Yes – No – I do not know If not, why not? – Lack of equipment – Insufficient quality of the equipment – Other (please, state the reason) The data could be acquired by prescribing the obligation of conducting the interviews among the target groups. This obligation can be prescribed by the Information Society Agency.

Incidence:	Annually.
Correlated indicators:	Connection to Internet Quality index of the computer equipment for teaching and scientific and research work
Indicator Weight Factor:	4
Indicator validity:	4
Indicator availability:	4

Indicator definition(I22):	Quality index of the computer equipment for teaching and scientific and research work. Quality index of the computer equipment is calculated on basis of the indicators: – Type of computers – Age of computers Scoring of the computer equipment quality index:

Age	Type of computer			
	PC	Work station	Mainframe	Super-computer
Older than 4 years	1	2	4	8
2-4 years	2	4	8	16
Younger than 2 years	4	8	16	32

These values are used for determining the quality within limits 0 (1 score) to 10 (32 scores). It is used for calculation:

$$I22 = \frac{\sum_1^s QCE_s}{s}$$

QCEs computer equipment quality index in teaching process and scientific and research work

S – total number of participants in teaching process and scientific and research work.

Importance of the indicator:	Complex software that is used in teaching process and scientific and research work require appropriate hardware. High quality hardware is a precondition for computer-based education and a high level research. The index rise shows the improvement of hardware in the field of teaching and scientific and research work in the country, which provides a faster acquisition of results in this field.
Source of information:	– Schools – Faculties – Universities – Institutes – Other research institutions and companies The data are collected in a form of a questionnaire.

Data collection:	The data are collected in a form of a questionnaire, which is then sent to target group in electronic form or in writing: What type of computer do you usually use for scientific and research work? – PC – Work station – Mainframe – Super-computer – Other, specify – I do not know How old is the computer you usually use for scientific and research work? – Less than 2 years – Between 2 and 4 years – Over 4 years – I do not know The data could be acquired by prescribing the obligation of conducting the interviews among the target groups. This obligation can be prescribed by the Information Society Agency.
Incidence:	Annually.
Correlated indicators:	Use of computers in teaching and scientific and research work Connection to Internet
Indicator Weight Factor:	4
Indicator validity:	4
Indicator availability:	3

Indicator definition (I23):	Number of computers per 100 students in primary and secondary schools and universities I23=(total number of computers used in teaching process / number of students) *100
Importance of the indicator:	This indicator is important as it shows to what extent schools and universities are equipped with the computers.
Source of information:	– Schools – Faculties – Universities – Pedagogic Institutes The data are collected in a form of survey conducted in schools and universities.
Data collection:	The data are collected in a form of answers to question: – What is the total number of pupils/students in school/university? – How many computers in school are used for education purposes? The data could be acquired by prescribing the obligation of conducting the survey among the schools and universities. This obligation can be prescribed by the Information Society Agency and/or Pedagogic Institute.
Incidence:	Annually.
Correlated indicators:	Computer equipment quality index in teaching process and scientific and research work A general digital literacy of target population
Indicator Weight Factor:	4

Indicator validity:	4
Indicator availability:	4

Indicator definition (I24):	Development of electronically supported education at universities C_{teach_use}=(number of teachers who have used e-learning methods in teaching process over the past 6 months/total number of teachers)*100 C_{teach_dev}=(number of teachers who over the past 6 months developed a new electronic education content for e-learning needs / total number of teachers)*100 C_{stud}=(number of students who have used e-learning methods in classes over the past 6 months /total number of students)*100 $I24= 2*C_{teach\_use}/5 + C_{teach\_dev}/5 + 2*C_{stud}/5$
Importance of the indicator:	The indicator shows the penetration of electronically supported distance education in education process at universities. This indicator is important because it shows the application and development of e-Learning process at universities.
Source of information:	– Faculties – Universities – Student Unions – Student Associations The data are collected in a form of a questionnaire.
Data collection:	The data are collected in a form of a questionnaire and then sent to the target group in electronic form or in writing: Have you used some of the methods of electronically supported distance learning in classes over the past 6 months? Have you developed new electronic education content over the past 6 months? The data could be acquired by prescribing the obligation of conducting the survey among the teachers and students. This obligation can be prescribed by the Information Society Agency.
Incidence:	Annually.
Correlated indicators:	Indicators related to: – Use of computers in teaching process and scientific and research work – Use of Internet at universities – Use of NREN – Quality of computer capacities – Overall digital literacy
Indicator Weight Factor:	3
Indicator validity:	3
	3

Indicator definition (I25):	Number of education institutions with multimedia office I25=(Number of education institutions with multimedia office / number of education institutions)
Importance of the indicator:	This number shows to what degree the schools are equipped – in fact, it shows ICT capacities which represent a factor necessary for computerization of a society. It serves as a basis for planning the procurement of ICT equipment.

Source of information:	Schools / Pedagogic Institutes
Data collection:	Schools / Pedagogic Institutes provide filled forms to the Information Society Agency.
Incidence:	Annually
Correlated indicators:	It will be clearly prescribed what is considered a "multimedia office" – with regard to hardware, software, connection and services to be provided.
Indicator Weight Factor:	4
Indicator validity:	5
Indicator availability:	5

Indicator definition (I26):	Number of certified ICT users I26= Number of certified ICT users
Importance of the indicator:	The indicator shows a general level of computer literacy. This indicator is important as it is easily accessible and very objective / a valid indicator of the literacy level.
Source of information:	– Certified education centers The data are collected in a form of number of users who have a valid certificate, and level of literacy (e.g. a full or basic ECDL, Cisco CCNA or CCNP, MCP, MOS...)
Data collection:	The data can be acquired by prescribing an obligation for authorized training centers to file reports to the Information Society Agency.
Incidence:	2 or 3 times a year – a sufficient indicator, which does not represent an additional burden to training centers.
Correlated indicators:	
Indicator Weight Factor:	4
Indicator validity:	5
Indicator availability:	4

Indicator definition (I27):	Professional competence of the informatics teachers according to pedagogical standards I27=(Number of informatics teachers trained in accordance with pedagogical standards /number of teachers of informatics)
Importance of the indicator:	The indicator shows how many teachers of informatics there are in primary and secondary schools who meet a 100% of qualification requirements. This indicator is important because these teachers are the key factor in disseminating to younger population the knowledge in the field of ICT.
Source of information:	Pedagogic Institutes provide information about the teachers (education background, certificates, professional advancement, results of periodical tests.)
Data collection:	The data are collected through uniform forms. On basis of these data, centers for accrediting the teachers and schools provide accreditations to the teachers and schools.
Incidence:	Annually – prior to beginning of the school year
Correlated indicators:	

Indicator Weight Factor:	3
Indicator validity:	3
Indicator availability:	4

Indicator definition (I28):	Digital literacy Index Digital literacy is measured as COQS index (Communicate, Obtain, Question, Search), namely as the index that measures the level of digital literacy. The index is result of the values of reported level of competence in the fields measured by the following indicators: – Communication with others via Internet – Procurement (or download) and installation of software on computer – Identification of information source on the Internet – Finding desired information on the Internet $(1)\ COQS_r = \frac{\sum_1^J (\text{Skill type} * \omega)_j}{J}$ $(2)\ \overline{COQS} = \frac{\sum_1^R COQS_r}{R}$ COQS – a measure of digital literacy of an individual r (Communicate, Obtain, Question, Search) J – total number of skills that are taken into account (Communicate, Obtain, Question, Search) COQS – average COQS value for the state R – size of population (or number of interviewed persons) ω – measures the competence in certain field: 0 – I do not feel competent 5 – I feel pretty competent 10 – I feel totally competent
Importance of the indicator:	One of the main goals of e-Europe 2005 is to raise the level of digital literacy. Rise in value of COQS index points to the rise of digital literacy level of an individual/organization/society.
Source of information:	Information Society Agency and other independent research agencies

Data collection:	This is a complex indicator and relies on the following indicators: – Number of Internet users who know how to use search engines on the Internet – Number of Internet users who know how to find the source of desired information on the Internet – Internet users who know how to find and download the software/patch/plug-in from the Internet and who know how to install software on the computer Number of persons who feel capable of communicating via Internet, by using at least one of the following three media: – Use of e-mail – Use of service for communication in a real time (IRC-CHAT) – Creating a website It can be obtained through collecting the answers to following question: To what extent do you feel competent to: – Identify the source of desired information on the Internet – Communicate via e-mail – Use CHAT for communication via Internet – Create own website – Download and install the software on the computer – Find the information about the topic that you are interested in (use of Internet search engines) Answers: – I feel totally competent – I feel pretty competent – I do not feel competent – I do not understand the question – I do not know
Incidence:	Annually
Correlated indicators:	
Indicator Weight Factor:	3
Indicator validity:	1
Indicator availability:	0

eGovernance

9. ACTION PLAN

Action Plan stemmed directly from the chapter Strategic Courses, based on situation analysis, current trends and goals desired in certain field and the administration in general. Projects have the following characteristics:

- P: projects representing Prerequisites for other projects and for systematic and organized development of eGovernance;
- E: projects of special importance for their Efficiency, i.e. the estimated that those projects can achieve significant – important effects in relation to funds invested;
- F: Fundamental research projects, the execution of which sets up or provides key modules and elements of the eGovernance system;
- U: projects to implement services identified by the European Union as elementary services;
- O: Other services and functions implementation of which establishes the concept of eGovernance.

The section *Stakeholders and Participants* lists key participants in project implementation. Underlined sections indicate principal stakeholder(s) (one or more) of the activity. Acronyms used are:

- SMBH (CoM BiH)– Council of Ministers of Bosnia and Herzegovina,
- AIS (ISA)- Information Society Agency of Bosnia and Herzegovina,
- ENT - Entity Government and appropriate ministries tasked with informatization at entity level,
- DISTR - Brčko District government and appropriate ministries/bodies tasked with informatization at District level,
- KAN - Cantonal governments and appropriate ministries/bodies tasked with informatization at cantonal level,
- LOK - local administration authorities (mayors/presidents of municipalities) and appropriate bodies tasked with informatization at city/municipality level.

Remarks.

A. Governance in the sense in which it was defined in this Strategy (in accordance with the term 'administration' in the Information Society Development Policy) covers only one part of aspects of system of education, health, legislation, economy and similar, which related to activities in the said fields – carried out in ministries, sectors and departments of the administration. For those reasons, automatization of key functions from those fields is not explicitly specified in this Strategy as this will be done in related sectoral strategies (eEducation, eHealth, eLegislation, eIndustry) while the implementation of related functions in the administration is under the section 'Other specialized functions of eGovernance'.

B. Programs included in the Action Plan are listed by fields of activity and not by priority. The priority of a program is determined/indirectly specified by characteristics outlined. Projects of the highest priority are those marked with P, i.e. those that are prerequisites for other projects. Then there are projects marked with E, i.e. those that will yield most results in comparison to funds invested. Priorities follow in this order F (fundamental), U (projects implementing the basic eGovernance services identified by the European Union) and finally those marked with O (other projects). If two projects are marked with the highest priority mark (e.g. E), then the one with the highest number of other priority features has more importance (e.g. a projects with marks E, F, U ranks higher on the priority list then the projects with marks E, F). These remarks on priorities should be considered as orientation guidance, priorities may be changed in terms of possible specific qualities of certain projects, specificities which are not incorporated in the said parameters.

1

Type of activity	Project
Title of activity	Drafting detailed network plan for implementation of projects envisaged by the Action Plan
Stakeholder	AIS
Participants	Entity governments and Brčko District Government Public administration, academic and private sector experts
Description of activity	Network plan should furthermore specify implementation of activities in projects outlined in the Action Plan, the necessary resources (IT staff, funds etc.), requests for implementation of other activities, time frames etc. Identified should be potential dates for start of parallel activities and mutually dependent chains. Limited availability of money and staff could postpone some projects parallel implementation of which is feasible per principles of network planning. After this general network plan, conditions will be created to elaborate on network plans for every project and identify dependence between certain projects activities and different projects.
Expected outcome	More precise plan of Strategy's implementation, resource for better planning of resources needed and more certain execution of planned activities. Identification of dependence between project activities of different projects and creation of prerequisites for elaboration of detailed network plans for every project.
Prerequisites	Involvement of a larger circle of experts competent for certain projects, experts in the field of network planning.
Period of execution (timeframe)	2004 – 2005
Financial prognosis	500.000 KM
Critical implementation factors	Establishment of the Information Society Agency, organizational unit for informatization – entity/District, selection and involvement of competent experts, project management and coordination.
Funding sources	SMBH, ENT, DISTR
Development environment	Internet, network planning tools
Implementation monitoring	Project implementation monitoring in all phases of development and implementation
Risks	Receiving quality input, encompassing large number of projects, coordination of large number of participants

2

Type of activity	Project
Title of activity	Ensuring legislative framework for eGovernance development
Stakeholder	Council of Ministers, entity governments
Participants	BiH Ministry of Justice, cantonal and entity ministries of justice, Ministry of Administration and Local Self-government, State Administration Agencies, Legislation Secretariat
Description of activity	Project would provide detailed analysis and overview of existing legislation from the perspective of legislative support to the concept of introduction of eGovernance. Following that, made would be a plan of amendments to the laws in order to ensure complete legislative basis to support and assure uninterrupted implementation of information and communication technologies in the administration, among others: through adoption of the European Cyber crime Convention and adoption of appropriate laws, adoption and harmonization of other laws harmonized with 'acquis communautaire' e.g.: Law on Digital Signature, Law on Intellectual Property, including copyright, databases, patents, software, Law on Administration of the BiH Internet Domain and others. This activity would also include drafting necessary laws to be put into parliamentary procedure via the competent institutions.
Expected outcome	Passage of the necessary laws to ensure computer program of electronic business in the administration
Prerequisites	Political agreement, familiarity with situation in the country, particularly with regard to demands, opinions and situation in the European Union and the European Commission. Familiarity with legislation of the developed countries in the world. Adequate funds, infrastructure and staff.
Period of execution (timeframe)	2004 - 2006
Financial prognosis	Total costs: 250. 000 KM
Critical implementation factors Lack of IT-legal staff. Absence of political will and agreement to legally regulate this important field (administration).	
Funding sources	Entity and cantonal governments, donations, municipalities
Labor market, human resources, necessary knowledge and skills	Establishment of new services is not necessary but it would be necessary to provide additional training to a certain number of lawyers which would work on IT related legislation.
Development environment	Promotion and media campaign are necessary to lead to creation of appropriate political climate.
Time lines	As outlined in the implementation plan. One should consider the commitments Bosnia and Herzegovina undertook in terms of passage of appropriate legislation in the signed *Information Society Development Agenda of the Southeast European Countries,* such as: 1. adoption and ratification of the Council of Europe Convention on Cyber crime; 2. adoption of necessary laws on electronic business, electronic contracts and electronic signature, harmonized with relevant directives of the European Union. Adoption and implementation of legislation related to the intellectual property rights (copyright, databases, patents, software and semi-conductors) in accordance with relevant directives in accordance with relevant directives of the European Union. (Start of activities: 31.12. 2004)
Implementation monitoring	Inform stakeholders of all implementation phases

Risks	Absence of lawyers familiar with the European legislation and issues concerning regulation of computer program of information and communication technologies and electronic business and absence of political will and agreement.

3

Type of activity	Project
Title of activity	Reconstruction of administration
Stakeholder	Council of Ministers and entity governments
Participants	BiH Ministry of Justice, BiH Civil Service Agency, RS Ministry of Administration and Self-governance, RS Civil Administration Service, FBiH Civil Administration Service, representatives of municipalities in BiH
Description of activity	Conduct radical reforms at all government levels. Introduce managerial approach in public administration. Decentralize from entity to local level those bodies coming into direct contact with citizens. Find ways to defer to private sector all services not directly related to working with clients/parties. Improve work through reconstruction and introduce new methods and techniques in public administration (state and local level) so that the region may become part of the community of the developed and so that we may keep abreast of constant changes surrounding us. Reform should ensure that the administration is more functional, transparent, cheaper, user oriented. Reform is to ensure rights in accordance with European values and standards. Clear delimitation of roles and responsibilities of appointed persons in political processes and the responsibility of public servants not involved in political processes.
Expected outcome	Reform of the administration should be implemented as to ensure establishment of a stable, democratic and modern, efficient and effective administration, which will be in service of market economy and integration into European democratic processes and institutions.
Prerequisites	Reform program must receive the largest possible support of the political parties, economic sector, international community, public servants and all citizens. Quality and education of staff, legislation
Period of execution (timeframe)	2004 – 2006
Financial prognosis	2. 000 000 KM
Critical implementation factors	Absence of political decision on the need of radical administration reform, insufficient qualification of staff
Funding sources	All participants, following identified criteria
Development environment	Regulatory and political environment should be set for project implementation, through adoption of relevant regulations and standards. The latest technologies should be applied and social ambiance created for project implementation.
Implementation monitoring	Project implementation monitoring in all phases of development and implementation

4

Type of activity	Media campaign
Title of activity	Promotion of introduction of eGovernance
Stakeholder	AIS
Participants	Council of Ministers, entity governments, Public Broadcast Service All media, radio and TV stations (local and entity ones), all newspapers and publishers
Description of activity	eGovernance is to be promoted by presenting to all service users and all public servants the significance and the potential of new technologies and new method of work. Promotional campaign should be high quality and carefully implemented in order to obtain consensus necessary for its further development.
Expected outcome	Improved level of information of all service users and public servants on the necessity for implementation of changes and use of new information and communication technologies.
Prerequisites	Political agreement. Familiarity with the situation in our country and with demands, positions and situation in the European Union and the European Commission. Familiarity with the situation of eGovernance in developed countries of the world. Appropriate funds, infrastructure and human resources.
Period of execution (timeframe)	Continuous
Financial prognosis	Total costs: 100. 000 KM annually
Critical implementation factors Absence of political will and agreement to devote more attention to such an important field (eGovernance).	
Funding sources	Entity and cantonal governments, donations, municipalities
Labor market, human resources, necessary knowledge and skills	It is not necessary to establish new services, but it would be necessary to provide additional training to journalists which will work in promotional campaign
Development environment	Appropriate promotion and media campaign are necessary to support creation of appropriate political climate.
Technologies	It is not necessary to invest in new technologies. Most investments should be geared toward human resources and lease of broadcast time in the electronic and print media.
Time lines	Implementation should start immediately.
Implementation monitoring	All promotional activities should be monitored and appropriately documents. No step should be undertaken or completed without having been appropriately verified and approved. Inform stakeholders of all implementation phases.
Risks	Lack of funds and absence of political will and agreement

5

Type of activity	Organizational
Title of activity	Establishment of bodies/services tasked with informatization
Stakeholder	AIS (regional offices)
Participants	All organizational units of the administration Academic and private sector, non-governmental organizations
Description of activity	– Establish bodies/services tasked with informatization and strategy implementation and identify persons – stakeholders for informatization in administration bodies. In this bodies (departments, sectors, units, agencies) and depending on the available staff, it is possible to form groups or smaller organizational units tasked with certain segments of informatization (infrastructure, security, new technologies and development etc.).
Expected outcome	Established bodies/services – stakeholders in eGovernance implementation in related organizational units
Prerequisites	Decision-makers are aware of the need for and necessity of informatization. Expert groups – activity stakeholders – exist. Critical mass of quality staff is available.
Period of execution (timeframe)	2004
Financial prognosis	Total costs - as part of existing costs – activity implementation to be ensured by structural reassignment of staff.
Critical implementation factors Decision-makers are aware of the need for and necessity of informatization. Availability of quality staff.	
Labor market	There is a deficit on labor market in terms of young and quality staff in the field of information and communication technologies.
Development environment	Appropriate promotional and media campaign are necessary in order to create appropriate political climate.
Time lines	Commence implementation of this activity immediately, according to the activity plan.
Implementation monitoring	Inform higher administration levels of the situation with establishment of bodies/services at the related lower administration level.
Risks	Lack of quality staff, awareness and commitment on the part of decision-makers.

6

Type of activity	Organizational
Title of activity	Establishment of the eGovernance Development Forum
Stakeholder	AIS (regional offices)
Participants	All organizational units of the administration Academic and private sector, non-governmental organizations
Description of activity	– Establish a eGovernance Development Forum, which will gather government representatives as well as representatives of the private sector, universities, professionals in the field of administration and/or information technology, media, NGOs, to discuss issues of development and implementation of eGovernance as well as implementation plans, from the aspect of technology, economic effects and larger influence on development of democracy etc. The Forum could have different sections that would discuss particular aspects of eGovernance implementation.
Expected outcome	Establishment of the eGovernance Development Forum
Prerequisites	Decision-makers are aware of the need for and necessity of informatization and existence of professional forum. Critical mass of quality staff and their workload
Period of execution (timeframe)	2004
Financial prognosis	Total costs - as part of existing costs
Critical implementation factors Decision-makers are aware of the need for and necessity of informatization. Availability of quality staff.	
Labor market	Labor market has a deficit of young and quality staff in the field of information and communication technologies.
Development environment	Appropriate promotion of the eGovernance Development Forum is necessary.
Time lines	Commence implementation of this activity immediately, according to the activity plan.
Implementation monitoring	Inform higher administration levels on the Forum activities.
Risks	Lack of quality staff, awareness and commitment on the part of decision-makers.

7

Type of activity	Organizational
Title of activity	Establishment of Association of eMunicipalities
Stakeholder	AIS (regional offices)
Participants	Bodies/services for informatization in municipalities/cities of Bosnia and Herzegovina Higher levels of government, academic and private sector, non-governmental organizations
Description of activity	– Establish the Association of eMunicipalities, which will gather representatives of the local administration working on informatization of municipal information systems. The Association would organize meetings to discuss common problems and solutions and to present experiences. Meetings could also be thematic or departmental, to discuss certain specific aspects of implementation of eGovernance. Activities should be coordinated with activities of the eGovernance Development Forum.
Expected outcome	Establishment of Association of eMunicipalities
Prerequisites	Decision-makers are aware of the need for and necessity of informatization and existence of professional forum. Critical mass of quality staff and their workload
Period of execution (timeframe)	2004
Financial prognosis	Total costs - as part of existing costs
Critical implementation factors Decision-makers are aware of the need for and necessity of informatization and significance of exchange of experiences and good practice. Availability of quality staff.	
Labor market	Meetings organized by the Association would gather experts from universities, private companies, foreign experts, non-governmental sector, media representatives etc. Current IT staff structure in the administration is unsatisfactory.
Development environment	Adequate promotion of the eMunicipalities Association is necessary.
Time lines	Commence implementation of this activity immediately, according to the activity plan.
Implementation monitoring	Inform higher administration levels of the Association's activities.
Risks	Lack of quality staff, awareness and commitment on the part of decision-makers

8

Type of activity	Research project
Title of activity	Analysis of potential and recommendations for computer program of open software
Stakeholder	AIS
Participants	ENT, DISTR, academic and private sector
Description of activity	Analysis of characteristics, potential and perspective of 'open source' product that could be used in the eGovernance implementation. Advantages and disadvantages in relation to proprietor software. Analysis of experiences, practice and trends in other countries. Look at the necessary and available human resources for support to the use of open source software. Analysis of economic, security and other effects. Recommendations for use of concrete products and concept of terms. Recommendations for establishment and organization of support centers.
Expected outcome	Recommendations for use of concrete products and concept of terms. Establishment and organization of support centers.
Prerequisites	Existence of human resources for support to computer program and use of open source software
Period of execution (timeframe)	2004 - 2005
Financial prognosis	300 000 KM
Critical implementation factors Availability of quality staff. Influence of companies representing/selling proprietor software	
Labor market	Insufficient human resource potential for support to open source software. Training should be planned through university centers.
Development environment	Strong promotion of open source software is necessary.
Time lines	According to the activity plan
Implementation monitoring	Through regular reports
Risks	Lack of quality staff, decision-makers' awareness of the significance of open source software, influence of companies with proprietor software.

9

Type of activity	Research project
Title of activity	Development and definition of methodology for development of programs and systems in public administration
Stakeholder	AIS
Participants	Experts in different fields (administration, IT staff/from entity and District governments, users) academic and private sector.
Description of activity	Develop methodology to define a regulated and systematic range of activities of government bodies when defining demands and developing programs, introducing new products and solutions and maintenance in the exploitation phase (product life cycle) and referential standards, to include, among others: – Identification of program type/activity – Definition methodology and content of project demands as well as responsible stakeholders – Terms of program development, testing records and product reception – Conditions and options of product maintenance and supplement
Expected outcome	Methodology for public administration program and system development and maintenance
Prerequisites	Familiarity with software engineering method and analysis system, projection and testing methodology and others. Familiarity with needs of and procedures used in the administration. Existence of critical mass of quality staff.
Period of execution (timeframe)	2004 – 2005
Financial prognosis	Total costs - 200 000 KM
Critical implementation factors There is no critical mass of necessary experts in one place. As there is no appropriate competent body, it is difficult to harmonize activities and coordinate development of information sub-systems. Irrational expenditure of budget funds and donations.	
Funding sources	Entity and cantonal governments, donations, municipalities
Labor market	It is not necessary to establish new services, but it would be necessary to provide additional training to certain staff of different profiles so that they may appropriately partake in methodology development and definition process.
Development environment	Appropriate promotion and media campaign are necessary in order to create appropriate political climate.
Technologies	Technologies and methods of product development and maintenance
Time lines	According to the activity plan
Implementation monitoring	Inform stakeholders of all implementation phases. It is extremely important to set precise, measurable, numeric criteria for assessment of results achieved in development of programs and systems in the public administration.
Risks	Absence of quality staff and funds

10

Type of activity	Research and development project
Title of activity	Development of management methodology for information-communication projects in public administration
Stakeholder	AIS
Participants	Experts in different fields (IT staff, users) – from the administration, universities and private sector
Description of activity	Analyze the process of preparation, development and implementation of the information and communication projects. Adopt common methodology, to define the following, among others: - Conditions to obtain approval and launch projects (feasibility study) - Methodology to define selection criteria for best bidder - Contract negotiation and definition of contract content - Organization of working team within the related organizational unit and coordination of activities within the working team - Communication with external companies, planning and monitoring implementation of activities and solving conflict situations - Evalvation of the project implementation success
Expected outcome	- Methodology for management of information and communication projects in public administration is defined and adopted.
Prerequisites	Establish the existing business model of decision-making in the administration, familiarity with needs of and procedures used in the administration. Existent of critical mass of quality staff.
Period of execution (timeframe)	2004 - 2005
Financial prognosis	Total costs: 200 000 KM
Critical implementation factors There is no critical mass of the necessary experts in one place. As there is no appropriate competent body, it is difficult to harmonize activities and coordinate development of information sub-systems. Readiness for coordinated and joint efforts to solving of common problems.	
Funding sources	BiH budget, entity and cantonal governments, donations, municipalities
Labor market, human resources, necessary knowledge and skills	It is necessary to provide additional training to certain staff of different profiles in order to have them participate actively in development and definition of methodology for management of information and communication projects in public administration.
Development environment	Appropriate promotion and media campaign are necessary, in order to create appropriate political climate. Appropriate infrastructure.
Implementation monitoring	All implementation related activities should be monitored and adequately documented. Inform stakeholders of all implementation phases.
Risks	Lack of project management staff and absence of political will and agreement

11

Type of activity	Development project	
Title of activity	Identification, systematization and adoption of standards necessary for development of information society in Bosnia and Herzegovina	
Stakeholder	Institute for Standards, Intellectual Property and Measurements, BiH Information Society Agency	
Participants	All IT service providers and all IT professionals working on development of IT solutions for eGovernance as well as all eGovernance users	
Description of activity	Provide creation of uniform database on all IT standards. Conduct their systematization by field of computer program, significance and resource of use in our circumstances. Drafting and passage of standards necessary for implementation of eGovernance functions, by adopting solutions from the EU and countries that have advanced far in terms of information society implementation.	
Expected outcome	Implementation of this project would create the necessary conditions to create a uniform database containing elementary information on standards, their significance and organization and would represent a more systematic manner of their search and easier use. All information and communication technology standards are adopted to support and ensure eGovernance development and implementation.	
Components	--- Component Activity 1	I. – global standards analysis II. – systematization and organization of standards in database III. – presenting standards in original and translated version
	---Component Activity 2	I. – adoption of key standards II. – computer program of standards in practice III. – maintenance of standards database from one center IV. – innovation of standards V. – exchange of standards between users
Prerequisites	Funds, user level of training, legislation	
Period of execution (timeframe)	2004 – 2006	
Financial prognosis	200 000 KM	
Critical implementation factors Insufficient number of staff in the standardization field. Lack of training of user, lack of work planning and lack of project implementation funds.		
Funding sources	All participants, following certain criteria	

12

Type of activity	Project
Title of activity	Training of administrative staff in public administration
Stakeholder	AIS
Participants	BiH Civil Service Agency, RS Ministry of Administration and Local Self-Government, RS Civil Service Agency, FBiH Civil Service Agency, ministries of justice, Academic sector, private sector
Description of activity	Administrative staff in public administration should undergo additional training in the following areas: quality of public speaking, meeting organization, negotiation skills, conflict management, definition and implementation of vision, team work quality, management of changes, decision-making support resources, distance learning, computer program of new technologies. Modern conditions of business demand trained and educated servants with a lot more knowledge and experience. Administrative staff gets far too little additional education and development; therefore, it is necessary to plan their additional training. As new working methods demand education and service-oriented administrative staff, the aim is to provide them with additional education through seminars that will be organized depending on the type of work or position they are in.
Expected outcome	Additional education of administrative staff and senior management in public administration will contribute to their quality performance (expedited and quality service to the satisfaction of employees and clients).
Prerequisites	Appropriate funds
Period of execution (timeframe)	Continuous, from 2004 to 2006
Financial prognosis	300 000 KM annually
Critical implementation factors Authorities not interested in implementation	
Funding sources	Donations, entity and cantonal governments, municipalities
Labor market, human resources, necessary knowledge and skills	There is labor market and that is why establishment of new services is unnecessary. Staff working on project implementation should be additionally trained. Modern working conditions, including work in the administration, demand employees with a lot more knowledge and skills and that is why permanent education and professional development is necessary with computer program of new information and communication technologies.
Development environment	Appropriate training premises are necessary.
Time lines	Beginning of 2004
Implementation monitoring	All implementation-related activities should be monitored and documented with timely reporting from stakeholders in different implementation phases
Risks	Poor selection of topics and poor turnout at seminars

13

Type of activity	Project
Title of activity	Communication infrastructure project in the public sector of Bosnia and Herzegovina
Stakeholder	AIS, ENT, DISTR
Participants	Telecom operators, Elektroprivreda, Railways, academic and private sector
Description of activity	a) Analysis of the existing situation in public administration communication infrastructure. Analysis of current and planned flow and volume of information exchange and the necessary transmission capacities. Analysis of technological trends in the field of transmission of information and telecommunications. Detailed description of requests. b) Analysis of the system and project requirements. Analysis of the capacity and potential of the existing and potential providers of telecommunication services as well as human resources in public administration. Implement the project of connecting all administration's organizational units to ensure efficient information exchange between all organizational units needing information exchange. Project requirements must emphasize the significance of the most economic and sustainable solution in the long term, while meeting demands for service quality, capacity, protection and reliability of telecommunication network. Solution must also ensure: – Resource of development/evolution, especially in view of resource of popular use of broadband communications, – Build on existing capacities and based on the criterion of economic cost-effectiveness, – Resource of having user's access to information of interest to him/her, on the basis of interactive and direct (on-line) communication. eGovernance communication infrastructure should encompass infrastructure at the following levels: – public access points – municipal level – cantonal/regional level – entity and Brčko District level – level of Bosnia and Herzegovina.
Expected outcome	a) Project requests for communication infrastructure in the public sector of Bosnia and Herzegovina b) Communication infrastructure project of the public sector of Bosnia and Herzegovina
Prerequisites	Funds and agreement of project implementation stakeholders
Period of execution (timeframe)	2004 – 2005
Financial prognosis	500 000 KM
Critical implementation factors - Agreement of decision-makers to implement the project - Expert team that will implement the project - Readiness of all relevant parties to cooperate	
Funding sources	- Budgets, mobile operator licenses, donations and assistance of EU, international organizations and other countries
Labor market	To implement this project, it is necessary to involve national experts in the telecommunications field (government sector, telecoms, private sector), academic sector as well as a number of foreign consultants.

Time lines	Project is to be implemented in a planned time frame. Construction communication infrastructure is of key importance for the implementation and success of all other segments of eGovernance development.
Implementation monitoring	Through reports and project benchmarks as well as EU statistical indicators

14

Type of activity	Implementation
Title of activity	Implementation of the communication infrastructure project in the public sector of Bosnia and Herzegovina
Stakeholder	AIS
Participants	ENT, DISTR, KANT, LOK Telecom operators, Elektroprivreda, Railways, academic and private sector
Description of activity	Implementation of public administration communication infrastructure in Bosnia and Herzegovina based on the project
Expected outcome	Communication infrastructure in public administration in Bosnia and Herzegovina is implemented in order to ensure efficient, economic, secure and quality transfer of multimedia information between all organizational units of administration among which exists the need for information exchange, following the model of business processes.
Prerequisites	Funds and agreement of project implementation stakeholders
Period of execution (timeframe)	2006 – 2007
Financial prognosis	30 000 000 KM
Critical implementation factors - Agreement of decision-makers to implement the project - Expert team to lead project implementation - Readiness of all relevant parties to cooperate	
Funding sources	- Budgets, mobile operators licenses, loans, donations and assistance of EU, international organizations and other countries.
Labor market, human resources, necessary knowledge and skills	To implement this project, it is necessary to involve national experts in the telecommunications field (government sector, telecoms, private sector), academic sector as well as a number of foreign consultants. There is critical mass necessary to implement this project.
Time lines	Project is to be implemented within planned time frame. Implementation of the communication infrastructure is of key importance to the implementation and success of all other segments of eGovernance development.
Implementation monitoring	Through reports and project benchmarks as well as EU statistical indicators

15

Type of activity	Research project
Title of activity	Definition of concept and standards for information inter-operability in public sector
Stakeholder	AIS
Participants	ENT, DIS, organizational units for informatization
Description of activity	Based on international experiences, defined and adopted should be the concept and standards for information inter-operability. As part of this activity, defined should be bodies competent for development of standards, rules of procedures. Defined should be the basic database of metadata which would ne used in information exchange on the basis of existing standards; provide for mechanism of verification and modification of standards, publication of standards and control of standards' use in public sector.
Expected outcome	- Defined organizational unit which would be the stakeholder ensuring inter-operability - Defined concept and rules of inter-operabiklity and necessary standards adopted - Defined basic databases of metadata and manner of their use in the information exchange process
Prerequisites	Funds and agreement of activity stakeholders to implement pilot-project
Period of execution (timeframe)	01. 06. 2004 – 01. 06. 2005 Working to define metadata/protocol to ensure inter-operability must be continued evene after this phase where metadata/protocols for inter-operability of key parties would be defined.
Financial prognosis	350 000 KM
Critical implementation factors - Agreement of decision-makers to implement the project - Expert team to implement the project	
Funding sources	- Donation for administration reform - Government bodies budget
Labor market, human resources, necessary knowledge and skills	To implement this project, it is necessary to involve local ICT experts, as well as a number of consultants from countries with extensive experiences.
Time lines	Implement the project within planned timeframe.
Implementation monitoring	Through reports and project benchmarks

16

Type of activity	Pilot-project
Title of activity	Implementation of pilot-project for verification and execution of the inter-operability concept
Stakeholder	AIS
Participants	ENT, DISTR – organizational units for informatization, Inter-operability Forum
Description of activity	Based on defined concept and standard, information exchange is to be conducted between selected information systems of the administration, verify concept of different organizational units according to the mentioned standards and conduct the necessary tests.
Expected outcome	- Verification and establishment of the inter-operability concept in practice - Achieving the element of global inter-operability on the basis of international standards
Prerequisites	Agreement of stakeholders and participants in the activities to implement the pilot-project
Period of execution (timeframe)	01. 01. 2005 – 01.12. 2006
Financial prognosis	350 000 KM
Critical implementation factors - Cooperation between project participants	
Funding sources	- Donation for administration reform - Government bodies budget
Labor market, human resources, necessary knowledge and skills	Necessary cooperation between administration, businesses, faculties and institutes.
Time lines	Implement the project within planned timeframe.
Implementation monitoring	Regular reports on project implementation

17

Type of activity	Organizational
Title of activity	Establishment of the Forum for Information Inter-operability
Stakeholder	AIS
Participants	ENT, DISTR, KAN, LOK – organizational units for information technology, private sector, faculties, institutes
Description of activity	Based on regulations defined for establishment for inter-operability organizational units; establish a Forum to discuss the concept, ideas and problems related to inter-operability and to promote use of solutions and standards.
Expected outcome	- Establishment of the Inter-operability Forum
Prerequisites	Conduct of research on inter-operability
Period of execution (timeframe)	01.10. 2004 – 31.12. 2004
Financial prognosis	-
Critical implementation factors - Agreement of participants to establish such a body	
Time lines	Implementation within planned timeframe

18

Type of activity	Implementation project
Title of activity	SMS Gateway
Stakeholder	AIS
Participants	Government bodies
Description of activity	Set-up servers for access through GSM network to information in central databases. Design computer programs to provide such access. Define security system.
Expected outcome	Resource of retrieving information from central bases via GSM network, use of SMS services.
Prerequisites	Legislation regulating this type of access and use of information. Need of institutions to use information obtained in this manner.
Period of execution (timeframe)	01. 06. 2004 – 01.10. 2004
Financial prognosis	100 000 KM
Critical implementation factors Resource of cooperation with telecoms in BiH in order to efficiently use this method of access to information	
Funding sources	Funding on the part of institutions that will use information
Labor market, human resources, necessary knowledge and skills	Information and telecommunications knowledge
Technologies	GSM, WAP
Implementation monitoring	Monitoring through reports
Risks	Lack of interest on the part of administration and system users

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Type of activity	Implementation project	
Title of activity	Information exchange server - National Gateway Server	
Stakeholder	AIS, SMBiH	
Participants	All situations requiring information exchange	
Description of activity	Set-up server that will be able to access input/requests for information, including user authentification control and authorization for information access and ensure receipt of information from appropriate database server and their transfer to requesting party.	
Expected outcome	Information exchange	
Components	1. Necessary analysis and project design	Situation assessment, project definition and implementation plan
	2. project implementation	Implementation according to plan
Prerequisites	Defining concept of inter-operability and security	
Period of execution (timeframe)	01. 01. 2005 – 01. 06. 2006	
Financial prognosis	300 000 KM	
Critical implementation factors Existence of legislative prerequisites for information exchange		
Funding sources	Institutions that will use information exchange	
Labor market, human resources, necessary knowledge and skills	There are human resources necessary for project implementation	
Development environment	Develop legislation for information exchange, create political prerequisites for free information flow.	
Technologies	Software database technologies, security technologies, communication technologies	
Implementation monitoring	Define mechanisms and implementation monitoring in the project.	

20

Type of activity	Research project
Title of activity	Management of electronic records
Stakeholder	AIS
Participants	Entity and cantonal governments, local administrative bodies
Description of activity	Defining procedures and recommendations for successful management of electronic records: right of access, resource of modification, archive timeframe etc.
Expected outcome	Through definition of procedures and recommendations for management of electronic records, end users (state bodies, institutions etc.) receive knowledge and ideas on how to organize information systems so that they may provide functional and secure services, i.e. automatize certain processes. Introduction of electronic systems of electronic documents and records management in state-level institutions, one will be able to access data and information and the same will be maintained as to preserve authenticity and integrity of information stored while at the same time electronic and paper-based archiving systems will be harmonized. Defining the level and procedure of archiving, making back-up copies of information for different purposes
Prerequisites	Securing funds
Period of execution (timeframe)	2004 – 2006
Financial prognosis	200 000 KM
Critical implementation factors Insufficient or incomplete use of recommendations provided	
Funding sources	Donations, entity and cantonal governments
Labor market, human resources, necessary knowledge and skills	To implement methods and procedures, experts in IT and law are needed.
Development environment	There should be sufficient interest for consistent computer program on electronic file management in areas where the project is implemented.
Technologies	It is of key importance to consider the diversity of functions and need for storing and managing certain data, i.e. with records where combinations of software and hardware approach are the most important.
Time lines	Project implementation should commence as soon as possible.
Implementation monitoring	Periodic monitoring of use of procedures
Risks	Complexity of certain methods could be unappealing, i.e. too expensive and too bulky to use for end users. Methods and techniques as well as archiving systems (hardware and software) change very quickly and these procedures can soon be outdated if they are not continuously updated.

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Type of activity	Project and implementation of computer program
Title of activity	Procedures and terms of access and use of information in fundamental/central registers
Stakeholder	AIS
Description of activity	Creation of technical prerequisites and procedures for access to information.
Expected outcome	Resource of access to central registers according to defined procedures and regulations
Prerequisites	Legislation, defining concept of inter-operability and security
Period of execution (timeframe)	2004 – 2005
Financial prognosis	80 000KM
Funding sources	Budget

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Type of activity	Project and implementation of computer program	
Title of activity	Personal and vehicle registration documents on-line	
Stakeholder	AIS	
Participants	Ministries of Interior, Ministry of Civil Affairs and Ministry of Traffic and Communications	
Description of activity	Resource of submitting requests via internet for documents	
Expected outcome	On-line documents service implemented	
Components	Legislation	Amendment of existing laws providing for electronic business in this field
	Project implementation	Implementation of technical aspects
Prerequisites	Existence of appropriate legislation, infrastructure, implementation of adequate security mechanisms at the AIS level, as well as concept and regulations of use of information from central bases and information exchange servers.	
Period of execution (timeframe)	2006 – 2008	
Financial prognosis	600 000 KM	
Critical implementation factors Ensure the necessary legislation and have adequate security and protection mechanisms.		
Funding sources	Budget	
Labor market, human resources, necessary knowledge and skills	IT and legal staff should be trained for this type of project.	
Technologies	WEB, DB, security and communication technologies	
Implementation monitoring	Project is to be implemented in phases - per size of locations. Implementation monitoring will be done through regular reports. Implementation assessment will be done based on specific benchmark indicators 1-4, described in Annex 2 of the eGovernance Development Strategy.	
Risks	Resource of misuse due to parallel development of security concept. Administration is skeptical to changing from traditional way of working. Low percentage of internet penetration. Low percentage of internet penetration.	

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Type of activity	Project and implementation of computer program	
Title of activity	Temporary residence on-line	
Stakeholder	AIS	
Participants	Ministries of Interior, Ministry of Civil Affairs and Ministry of Traffic and Communications	
Description of activity	Change of registration of temporary residence via Internet	
Expected outcome	On-line documents service implemented	
Components	Legislation	Change of existing laws providing electronic business in this field
	Project implementation	Implementation of technical aspects
Prerequisites	Existence of appropriate legislation, infrastructure, implementation of appropriate security mechanisms at AIS level, as well as concept and regulations of use of information from central bases and information exchange servers.	
Period of execution (timeframe)	2006 – 2008	
Financial prognosis	200 000 KM	
Critical implementation factors Ensure appropriate legislation as well as adequate security and protection mechanisms.		
Funding sources	Budget	
Labor market, human resources, necessary knowledge and skills	It is necessary to educate IT and legal staff for this type of project.	
Technologies	WEB, DB, security, communication technologies	
Implementation monitoring	Implement project in phases - as per size of location. Implementation monitoring through regular reports. Implementation assessment will be done based on specific benchmark indicators 1-4, described in Annex 2 of the eGovernance Development Strategy.	
Risks	Resource of misuse due to parallel development of security concept. Administration is skeptical to changing from traditional way of working. Low percentage of internet penetration. Low percentage of Internet penetration.	

24

Type of activity	Project and implementation of computer program	
Title of activity	Register of temporary residence licenses for foreigners, visas and register of entries in and exit out of BiH	
Stakeholder	AIS	
Participants	Ministry of Foreign Affairs, Ministry of Security, Ministry of Interior	
Description of activity	Establish a visa and temporary residence system according to recommendations from ICAO, EU and OSCE. Introduce system of on-line control of state border crossing.	
Expected outcome	- Visa issue system - State border control system	
Components	Legislation	Change of existing laws providing electronic business in this field
	Project implementation	Implementation of technical aspects
Prerequisites	Existence of legislation, insurance of adequate security mechanisms, existence of the information exchange concept.	
Period of execution (time frame)	2005 – 2006	
Financial prognosis	1 000 000 KM	
Critical implementation factors Existence of appropriate legislation, coordination of competent institutions. Cooperation with ICAO i EU		
Funding sources	Budget and donations	
Labor market, human resources, necessary knowledge and skills	Education in technical and legal regulations	
Technologies	Software technologies (BP), current architectures, computer technologies	
Implementation monitoring	Monitoring of implementation of objectives by phases and based on reports	

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Type of activity	Pilot-project	
Title of activity	Harmonization and connection/integration of partial registers - Assessment of the work of administrations and reengineering	
Stakeholder	AIS	
Participants	ENT, DISTR, KAN, LOK, administrative bodies	
Description of activity	Identify records kept electronically in different administrative bodies (e.g. registry books, registers of businesses, registers of land-related information etc.), databases used in working with information from records, define plan to harmonize/connect partial registers so that records can be kept, i.e. obtained/exchanged electronically between all bodies per defined competencies.	
Expected outcome	- Overview of the situation in electronic records in public administration bodies - Plan to harmonize/connect key partial registers - Implementation of mechanisms for harmonization/connection of selected partial registers.	
Components	Analysis	Analysis of partial electronically kept records. Select five partial registers for harmonization/integration.
	Pilot project with maximum 5 partial registers	Project harmonization/integration of selected partial registers.
	Implementation of pilot project	Implement harmonization/integration of selected partial registers.
Prerequisites	Funds and agreement of activity stakeholders to implement pilot-project, inter-operability and security concept.	
Period of execution (timeframe)	01. 07.2004 – 01. 07. 2007	
Financial prognosis	1 000 000 KM	
Critical implementation factors Agreement at all government levels, primarily the Council of Ministers, entity governments and the government of Brčko District		
Funding sources	- Donation for administration reform - Government bodies budget	
Labor market	Users of partial registers in government bodies, IT experts	
Technologies	BP, VPN technologies, security technologies	
Time lines	Implement the project within planned timeframe. Through this project, several other concepts of eGovernance development are verified and other eGovernance projects oriented.	
Implementation monitoring	Implementation monitoring through regular reports. Project assessments and potential opposition to previous concepts to be used for their evalvation.	
Risks	Large number of participants, problem of coordination and cooperation, pressing for/imposing solution, resistance from 'owners' of information to provide access to 'their' information. Lack of staff.	

Type of activity	Project and implementation of computer program	
Title of activity	Tax system	
Stakeholder	AIS	
Participants	ENT, DISTR, tax institutions	
Description of activity	Implementation of information system for registering tax liabilities and payments of tax payers	
Expected outcome	Records set up of tax payers and monitoring of payments of liabilities regulated by the law	
Components	Legislation	Pass legislation and by-laws that will ensure project implementation.
	Pilot project implementation in maximum 5 municipalities and entity level	Plan and implement pilot project of the functioning of tax system.
	Project implementation	Implement the project in BiH according to defined plan.
Prerequisites	Legislation and clearly defined competencies, concept and regulations of security and information exchange.	
Period of execution (timeframe)	2004 – 2006	
Financial prognosis	4 000 000 KM	
Critical implementation factors Competent structures agree on project implementation		
Funding sources	Donations and budget	
Labor market, human resources, necessary knowledge and skills	There are human resources for project implementation; however, additional training is necessary in order to implement the project in accordance with EU standards.	
Technologies	DB, security, communication technologies	
Time lines	Project is of key importance to exercise legality in tax collection system, which is one of key prerequisites for the functioning of government bodies.	
Implementation monitoring	Implementation monitoring through regular reports. Due to project's importance, Council of Ministers, entity governments and the government of Brčko District should receive regular reports on project implementation.	

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Type of activity	Project and implementation of computer program	
Title of activity	Tax system on-line	
Stakeholder	AIS	
Participants	ENT, DISTR, tax institutions	
Description of activity	Implementation of on-line based tax registration and payment (WEB, SMS etc.)	
Expected outcome	Resource for a citizen to pay his/her liabilities	
Components	Legislation	Define legislation and by-laws which will ensure implementation of this project.
	Pilot project implementation in maximum 5 municipalities and entity level	Plan and implement on-line pilot project of the function of tax system
	Project implementation	Implement the project in BiH according to defined plan.
Prerequisites	Legislation, implementation of project 24, ensuring adequate infrastructure, implementation of appropriate security mechanisms, concept of information exchange and regulations of use of information from central databases.	
Period of execution (timeframe)	2007 – 2009	
Financial prognosis	2 000 000 KM	
Critical implementation factors Existence of developed infrastructure to support this project		
Funding sources	Donations and budget	
Labor market, human resources, necessary knowledge and skills	Human resources for project implementation, in accordance with EU standards	
Technologies	WEB, DB, security and communication technologies	
Time lines	Implement the project following implementation of IS tax administration. Conduct sound harmonization between pilot project and implementation in all locations.	
Implementation monitoring	Implementation monitoring through regular reports. Implementation assessment will be done based on specific benchmark indicators 1-4, described in Annex 2 of the eGovernance Development Strategy.	

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Type of activity	Project and implementation of computer program	
Title of activity	Customs – on-line	
Stakeholder	AIS	
Participants	Central customs' organizational units	
Description of activity	Once the IS customs implementation is complete and data is collected, on-line submission of customs declarations and payment should be implemented.	
Expected outcome	On-line submission of customs declaration and payment of customs duties	
Components	Legislation	Harmonize legislation and by-laws for implementation of this project.
	Pilot project implementation in maximum 5 municipalities and entity level	Plan and implement the pilot project of functioning of IS customs on-line.
	Project implementation	Implement the project in BiH according to defined plan.
Prerequisites	Legislation	
Period of execution (timeframe)	2007 – 2008	
Financial prognosis	400 000 KM	
Critical implementation factors Existence of developed infrastructure and defined security mechanisms to support this project		
Funding sources	Donations and budget	
Labor market, human resources, necessary knowledge and skills	Existing human resources can implement this project, with certain professional development provided in order to implement the project in accordance with EU standards.	
Development environment	Infrastructure and environment for electronic business	
Technologies	WEB, DB, security and communication technologies	
Time lines	Implement the project once the IC customs is completely implemented.	
Implementation monitoring	Implementation monitoring through regular reports. Implementation assessment will be done based on specific benchmark indicators 1-4, described in Annex 2 of the eGovernance Development Strategy.	

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Type of activity	Drafting the strategy
Title of activity	Security strategy in organizational units of the administration
Stakeholder	AIS
Participants	ENT, DISTR, other administration institutions
Description of activity	Define technical recommendations and terms, regulation books and technical security procedures, referential standards for secure transactions and information and documents exchange within administration's organizational units and between the administration and external systems: citizens, businesses, non-governmental and state institutions, governments of other countries.
Expected outcome	Strategy for secure electronic transactions in the administration and with the administration, to contain technical recommendations and terms, regulation books and technical security procedures as well as referential standards for administration's organizational units.
Period of execution (timeframe)	2004 – 2005
Financial prognosis	80 000 KM
Critical implementation factors Mechanisms for computer program of regulations	
Funding sources	Budget
Labor market, human resources, necessary knowledge and skills	Security and data protection experts
Implementation monitoring	Implementation assessment will be done based on specific benchmark indicator 5, described in Annex 2 of the eGovernance Development Strategy.

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Type of activity	Development
Title of activity	Defining and developing uniform authentification and authorization system– State Trust Center
Stakeholder	AIS
Participants	ENT, DISTR, KANT, other administration institutions
Description of activity	Definition, development and implementation of the authentification and authorization system for computer program in the administration
Expected outcome	Defined and implemented system of authentification and authorization for public administration computer program
Period of execution (timeframe)	2004 – 2006
Financial prognosis	1 200 000 KM
Critical implementation factors Lack of staff, awareness on the need for security in electronic transactions in public administration	
Funding sources	Budget, donations, loans
Labor market,	Experts for security and data protection
Implementation monitoring	Implementation assessment will be done based on specific benchmark indicator 5, described in Annex 2 of the eGovernance Development Strategy.

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Type of activity	Project
Title of activity	Project to introduce PKI infrastructure
Stakeholder	AIS
Participants	ENT, DISTR
Description of activity	Based on existing experienced in the world, researched should be relevant aspects for introduction of PKI infrastructure, define a concept and draft executional project to introduce PKI infrastructure, plan establishment of appropriate institutions/organizational forms for introduction of PKI infrastructure.
Expected outcome	Executional project of PKI infrastructure
Prerequisites	Security strategy
Period of execution (timeframe)	2004 – 2006
Financial prognosis	200 000 KM
Funding sources	Donations and budget
Labor market, human resources, necessary knowledge and skills	Specialized courses for staff will be necessary
Technologies	WEB, communication and security technologies
Implementation monitoring	Monitoring through regular reports

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Type of activity	Pilot project
Title of activity	Pilot project to implement PKI infrastructure
Stakeholder	AIS
Participants	ENT, DISTR
Description of activity	Based on activities and results of the project to introduce PKI infrastructure, PKI infrastructure is to be implemented and implementation verified through use of implemented infrastructure in selected number (up to 5) distributed computer programs and WEB-based programs.
Expected outcome	Limited implementation of PKI infrastructure, overview of all relevant aspects of extensive introduction and use of PKI infrastructure. Obtaining response on selection of the most the best technologies and solutions for secure electronic transactions and business of the administration.
Prerequisites	Implementation of project to introduce PKI infrastructure
Period of execution (timeframe)	2006 – 2007
Financial prognosis	1 000 000 KM
Critical implementation factors Experts in the field of security, electronic certificates and signatures	
Funding sources	Budget, donations
Labor market, human resources, necessary knowledge and skills	It will be necessary to provide training to national staff and hire foreign experts.
Development environment	Environment where electronic business and electronic transactions via Internet are developed and promoted
Technologies	WEB and internet, security, PKI and telecommunication technologies
Implementation monitoring	Through regular reports, it is important to conduct implementation within envisaged time frame, as results of this and previous phases should provide answers on long-term strategic security technologies to provide secure electronic transactions.

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Type of activity	Research
Title of activity	Identification of joint functions of the administration
Stakeholder	AIS, SMBH, ENT, DISTR
Participants	All administration institutions
Description of activity	Analysis and identification of administration functions that are common for all organizational units at all administration levels and which can be solved by joint/coordinated efforts and by exchange of experiences.
Expected outcome	List and description of common functions of the administration. Define principles and courses of action for implementation of IT support to these functions.
Period of execution (timeframe)	2004
Financial prognosis	80 000 KM
Critical implementation factors -	
Funding sources	Budget
Labor market, human resources, necessary knowledge and skills	Experts in administration's organizational units and in private sector
Implementation monitoring	Through regular reports

34

Type of activity	Project and implementation of service
Title of activity	e-mail service in public administration
Stakeholder	AIS, SMBH, ENT, DISTR, KAN, LOK
Participants	Organizational units for informatization in administration, private sector
Description of activity	Ensuring server and communication infrastructure for e-mail services for all administrative staff in public administration
Expected outcome	Availability of e-mail service at all administration levels to all administrative staff in the administration
Prerequisites	Existence of appropriate access communication infrastructure and equipment in organizational units of the administration
Period of execution (timeframe)	2004 – 2005
Financial prognosis	300 000 KM
Critical implementation factors Existence of developed infrastructure as basis for implementation of this project	
Funding sources	Donations and budget
Labor market, human resources, necessary knowledge and skills	Human resources exist to implement .this project. Administration staff should be trained in e-mail communication.
Technologies	Internet and communication technologies
Implementation monitoring	Monitoring number of users of e-mail service in public administration

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Type of activity	Project and implementation of computer program
Title of activity	Project and implementation of EDMS and Workflow systems
Stakeholder	ENT, DISTR, KAN, LOK, AIS
Participants	Organizational units for informatization in administration, private sector
Description of activity	Analysis of existing platforms, solutions and experiences. Selection of EDMS and Workflow platforms to work with electronic documents and monitoring implementation of administrative activities - status of business processes. Implementation of EDMS and Workflow solutions at the level of Council of Ministers, entity and cantonal governments and government of Brčko District. Implementation at municipal level where information infrastructure is necessary.
Expected outcome	Selection of EDMS and Workflow platforms in public administration. Implementation in the aforementioned units of the administration. Increase efficiency and facilitate the work of administrative staff. Maximum reduction of time required to issue documents requested by citizens and business, offering instantaneous information in electronic form, resource to obtain the necessary documentation and information in one place.
Prerequisites	Existence of appropriate IT infrastructure. Reengineering of working procedures in administration. Defined security strategy.
Period of execution (timeframe)	2004 – 2007
Financial prognosis	6 000 000 KM
Critical implementation factors Resistance from administrative staff to changing procedures and applying new technologies	
Funding sources	Donations and budget
Labor market, human resources, necessary knowledge and skills	Private sector. Comprehensive training of administrative staff is necessary in use of information technologies and in work with electronic documents.
Technologies	Internet and communication technologies
Implementation monitoring	Monitoring through benchmarks and regular reports. Monitoring of the implementation impact through monitoring (increase) the number of cases dealt with and (reduction) in time taken to deal with cases in administrative services.

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Type of activity	Project
Title of activity	eProcurement
Stakeholder	SMBIH, ENT, DISTR
Participants	KANT, LOK, Ministry of Finance and Treasury – public procurement body
Description of activity	Analysis of resource and effects of informatization in the process of public procurement and preparation of project based on project requests. Define necessary amendments to legislation.
Expected outcome	Project to implement public procurement procedures via Internet and in transparent manner.
Prerequisites	Resources, legislation, security strategy
Period of execution (timeframe)	2004 – 2005
Financial prognosis	200000 KM
Critical implementation factors Political agreement	
Funding sources	Donations and budget
Labor market, human resources, necessary knowledge and skills	Private sector. Comprehensive training for administrative staff in use of information technologies and work with electronic documents is necessary.
Technologies	Internet and communication technologies, security technologies

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Type of activity	Pilot project	
Title of activity	eProcurement	
Stakeholder	AIS, ENT, DISTR	
Participants	Ministries of finances and treasury – public procurement bodies	
Description of activity	Based on previous activity, select different institutions where eProcurement project will be implemented (maximum 5)	
Expected outcome	Implementation of this project will ensure execution of public procurement via internet and in transparent manner.	
Components	---Component Activity 1	I. – selection and procurement of hardware, installation of system software and development and installation of applicative software according to project set-up
	---Component Activity 2	I. – experimental implementation of public procurement via internet in selected administrative units II. – Analysis of results and definition of necessary supplement
Prerequisites	Resources, level of training, legislation, implementation of previous activity, security mechanisms, definition and implementation of the inter-operability concept.	
Period of execution (timeframe)	2006 – 2007	
Financial prognosis	500 000 KM	
Critical implementation factors Resistance to new technologies and transparency of process. Level of training of user and administrative staff.		
Funding sources	Donations and budget	
Technologies	Internet, database technologies, communication technologies, security and data protection technologies.	

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Type of activity	Project – Implementation of eProcurement computer program
Title of activity	Implementation of eProcurement
Stakeholder	AIS, ENT, DISTR
Participants	Ministries of Finances and Treasury - public procurement bodies
Description of activity	Based on previous activities, eProcurement project is to be implemented in all institutions where adequate IT infrastructure is available, at least at BiH level, entity, cantonal and Brčko District government level.
Expected outcome	Implementation of this project will ensure public procurement via internet and in transparent manner.
Prerequisites	Resources, level of training, legislation, implementation of previous activity.
Period of execution (timeframe)	2007 – 2008
Financial prognosis	3 000 000 KM
Critical implementation factors Resistance to new technologies and transparency of process. Level of training of user and administrative staff.	
Funding sources	Donations and budget
Technologies	Internet, database technologies, communication technologies, security and data protection technologies
Implementation monitoring	Implementation assessment will be done based on specific benchmark indicators 1-4, described in Annex 2 of the eGovernance Development Strategy.

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Type of activity	Project
Title of activity	Define statistical parameters and indicators of eGovernance development, manner of collection and monitoring of information
Stakeholder	Statistics Agency
Participants	Statistics Institutes, AIS, ENT, DISTR Administrative bodies
Description of activity	Define statistical parameters and indicators of eGovernance development and manner of collection and monitoring of information
Expected outcome	indicators of eGovernance development and manner of collection and monitoring of information are defined
Prerequisites	Funds and agreement of activity stakeholders to implement the project
Period of execution (timeframe)	2004 – 2005
Financial prognosis	100 000 KM
Critical implementation factors Agreement of decision-makers to implement the project, cooperation with countries with substantial experience	
Funding sources	- Donations to construct statistical institutions - Government bodies budget
Labor market, human resources, necessary knowledge and skills	Education of experts is necessary
Time lines	Implement the project within planned timeframe.
Implementation monitoring	Through regular reporting

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Type of activity	Project – Implementation of computer program
Title of activity	Information system of the Statistics Agency and on-line statistics
Stakeholder	Statistics Agency
Participants	AIS, ENT, DISTR, KAN, LOK Private sector, administrative bodies
Description of activity	Information system of the Statistics Agency that includes internet portal to publish statistical information. This site should serve as source of information for institutions, investors, companies etc.
Expected outcome	- More efficient work of the Statistics Agency - Business submit statistical information via Internet - Publish information via Internet as envisaged by the law
Prerequisites	Funds and agreement of activity stakeholders to implement the pilot project
Period of execution (timeframe)	2006 – 2008
Financial prognosis	2 500 000 KM
Critical implementation factors - Agreement of decision-makers to implement the project. Level of training of staff in use of computers.	
Funding sources	Donations and budget of relevant bodies
Labor market, human resources, necessary knowledge and skills	Available human resources in public administration and in statistical agencies/institutes. IT companies and experts in private sector.
Technologies	Internet, database technologies, communication technologies, security and data protection technologies
Time lines	Implement the project within planned timeframe.
Implementation monitoring	Assessment of the implementation of electronic submission of statistical data and informatization of functions and business of statistical agencies/institutes to be implemented based on benchmark indicators 1-4, described in Annex 2 of the eGovernance Development Strategy.

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Type of activity	Project
Title of activity	Monitoring eGovernance development
Stakeholder	AIS, cantonal and entity governments and Brčko District Government
Participants	Local administration bodies, citizens, private sector
Description of activity	Continuous Monitoring eGovernance development
Expected outcome	Analysis and assessment of impact of the eGovernance development through corrective methods
Prerequisites	Clearly defined indicators to monitor eGovernance development and methodologies
Period of execution (timeframe)	Permanent activity
Financial prognosis	1 000 000 KM
Critical implementation factors Lack of interest on the part of competent institutions and political leadership, mechanisms and sources of information necessary to define situations in eGovernance development	
Funding sources	Entity and cantonal governments, municipalities
Labor market, human resources, necessary knowledge and skills	Currently, there are sufficient human resources on labor market to implement this project.
Development environment	To implement this activity, special group should be established in existing institutions or agencies. Permanent promotion of results obtained through extensive media campaign.
Technologies	Consistent computer program of adopted (global and/or European) standards
Time lines	This program, i.e. activity should start in parallel with the first activity from the proposed action plan.
Implementation monitoring	Adoption of periodic reporting plan of higher-level institutions
Risks	Inadequacy of collected information, insufficient media attention

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Type of activity	Project and implementation computer program
Title of activity	Citizens' database – municipal registry offices
Stakeholder	Local administrative bodies
Participants	Entity and cantonal governments, AIS
Description of activity	Citizens' database, i.e. registry books of births, deaths, marriage and book of nationality-holders
Expected outcome	Regulated database on all entries into registry books, quick and easy issue of certificates from these records. Generation of automatic statistical entries.
Prerequisites	Securing funds.
Period of execution (timeframe)	2004. - 2006
Financial prognosis	1 200 000 KM
Critical implementation factors Decisiveness of local bodies to endure in complete and timely electronic registration	
Funding sources	Local administrative bodies, donations
Labor market, human resources, necessary knowledge and skills	To develop applicative solutions, professional IT and legal staff are necessary; for use – standard computer knowledge.
Development environment	Areas where the project is implemented, sufficient interest and political will are necessary to implement relevant activities.
Technologies	Key investment in the development of applicative software which should be used.
Time lines	According to planned time-frame
Implementation monitoring	Periodic monitoring
Risks	Insufficient interest on the part of competent bodies, large number of errors in transfer from paper-based to electronic register.

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Type of activity	Project and implementation computer program
Title of activity	Citizens' database – on-line municipal registry offices
Stakeholder	Local administrative bodies
Participants	Entity and cantonal governments, AIS
Description of activity	Supplement to applicative solution to citizens' database, i.e. registry book of births, deaths, marriages and book of nationality-holders
Expected outcome	On-line submission of requests to obtain all certificates from registry book
Prerequisites	Citizens' database project is successfully implemented, funds secured
Period of execution (timeframe)	2007 – 2008
Financial prognosis	800 000 KM
Critical implementation factors Inadequate legislation, security aspect of use of on-line service, expensive and insufficiently quick internet connection	
Funding sources	Local administrative bodies, donations
Labor market, human resources, necessary knowledge and skills	To develop applicative solutions, professional IT and legal staff are necessary; for use – standard computer knowledge.
Prerequisites	All legal obstacles should be removed for on-line service – equalize validity of electronically generated documents (with appropriate digital signature) with traditional documents etc.
Technologies	Internet, database technologies, communication technologies, security and data protection technologies. Key point is reliability of on-line service use, i.e. security aspect and appropriate , that is quick and reliable infrastructure.
Time lines	Start of the implementation is related to a successful end to implementation of construction license computer program.
Implementation monitoring	Periodic monitoring of the manner of use, i.e. number of on-line users, surveys related to the issue of simplicity of quality and speed of service. Assessment of the implementation in terms of submitting requests for certificates from registry offices is to be implemented based on benchmark indicators 1-4, described in Annex 2 of the eGovernance Development Strategy.
Risks	Expensive solution with potentially small number of users

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Type of activity	Project and computer program implementation
Title of activity	Land and real-estate register – GIS
Stakeholder	Entity governments, i.e. competent entity ministries
Participants	Republic and cantonal geodetic administrations, local administrations
Description of activity	Creation of integrated database on cadastre units, land and non-land information.
Expected outcome	Digitalization of maps and integration of information on owners of land and owners of real estate on land. Simple and quick insight into all relevant information related to urban planning and unlicensed construction. Connection of cadastre municipalities will create the necessary prerequisites to obtain a uniform base at the entity and BiH level for land-related information. Quick and easier inspection work in the civil engineering field. Standardization of geographic information. Quicker and simpler obtention of necessary licenses, certificates and decisions.
Prerequisites	Aerial photography of the entire country (where it was not done), existence of original land and cadastre books. All sketches, all prints and all maps are to be in digital form and compared with airplane shots to commence implementation of the geographic information system.
Period of execution (timeframe)	2004 – 2007
Financial prognosis	6 000 000 KM
Critical implementation factors Complexity of activities, base information are in different digital and paper formats, information stored in official bodies (change of ownership) is not updated	
Funding sources	Donations, Entity and cantonal governments
Labor market, human resources, necessary knowledge and skills	IT specialists in the field of projecting and transmission (digitalization) of maps in electronic file are necessary. Apart from IT experts, necessary are experts in the field of urban planning, architecture, civil engineering, which there are in the region in sufficient number.
Development environment	It is necessary to pass legislation to enable integration, i.e. storing of information in one place on owner of land and ownership over real-estate.
Technologies	Software tools for manipulation over multiplayer land maps. Definition of standards to display of land-related information or their harmonization.
Time lines	According to the implementation plan
Implementation monitoring	Method of activity implementation monitoring. Benchmarks.
Risks	The process may be prolonged as the information are not updated and some cannot be accessed at all.

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Type of activity	Project and computer program implementation
Title of activity	Land and real-estate register – GIS on-line
Stakeholder	Entity governments, i.e. competent entity ministries
Participants	Republic and cantonal geodetic administrations, local administrations
Description of activity	Supplement to applicative solution for land and real-estate register.
Expected outcome	On-line registration of ownership over land and real-estate. Decrease of transaction costs. On-line sale of maps.
Prerequisites	Create integrated database on cadastre units, land and non land-related. Cooperation between institutions which dispose of information, i.e. generate them.
Period of execution (timeframe)	2007 – 2008
Financial prognosis	2 000 000 KM
Critical implementation factors Different levels of digitalization of geographic data, inadequate legislation, security aspect of use of on-line service, expensive and insufficiently quick internet connection	
Funding sources	Donations, Entity and cantonal governments
Labor market, human resources, necessary knowledge and skills	IT experts of different profiles are necessary (programmers, web-designers, security experts etc.). Currently, there is no sufficient number of this type of human resources on the labor market. Different projects and potential of professional development should create the climate to develop national staff and not import human resources from abroad.
Development environment	Remove all legal obstacles for on-line servicing – equalize electronically generated document (with appropriate digital signature) with traditional document etc. communication infrastructure, solid media campaign to encourage users in use of on-line services.
Technologies	Internet, database technologies, communication technologies, security and data protection technologies. Key point is reliability of on-line service use, i.e. security aspect and appropriate , that is quick and reliable infrastructure.
Time lines	Start of the implementation is related to successful end to implementation of construction license computer program.
Implementation monitoring	Periodic monitoring of the manner of use, i.e. number of on-line users, surveys related to the issue of simplicity of quality and speed of service. Assessment of the implementation in terms of automatization of cadastre business is to be implemented based on benchmark indicators 1-4, described in Annex 2 of the eGovernance Development Strategy.
Risks	Expensive solution with potentially small number of users

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Type of activity	Project and computer program implementation
Title of activity	Information system for personnel and legal affairs
Stakeholder	Entity and cantonal governments, local administrative bodies
Participants	Local administrative bodies, competent ministries and agencies dealing with labor issues
Description of activity	Creation of uniform database on all staff employed at different levels of state bodies
Expected outcome	More efficient monitoring of staff in terms of needs and potential and use of regulations. More transparent work of the administration.
Prerequisites	secured funds
Period of execution (timeframe)	2004 – 2005
Financial prognosis	300 000 KM
Critical implementation factors Lack of interest on the part of participants, records not updated	
Funding sources	Entity and cantonal governments, local administrative bodies, donations
Labor market, human resources, necessary knowledge and skills	There is adequate market of labor, knowledge and skills.
Development environment	Develop appropriate legislation.
Technologies	Connection of different participants, i.e. with communication technologies
Time lines	According to the implementation plan
Implementation monitoring	Periodic monitoring of entries and accuracy of information in the database
Risks	Lack of harmonization of registers between individual users, information is outdated, certain parties are not ready to follow human resource policy in reality.

47

Type of activity	Project and computer program implementation
Title of activity	Construction licenses computer program
Stakeholder	Local administrative bodies, entity governments, AIS
Participants	Entity institutions – cadastre, legal and property affairs bodies
Description of activity	Implement computer program to enable electronic registration of requests, automatized request processing procedure and register all issues, certificates and licenses for construction.
Expected outcome	Database on issued certificates for construction, monitoring of collection and rents for issued licenses, prevention of unlicensed construction– resource of complete inspection supervision, cancellation of monopoly and reduction of potential for corruption.
Prerequisites	securing funds, defined concept of inter-operability, document management and processing of cadastre information
Period of execution (timeframe)	2005 – 2007
Financial prognosis	1 200 000 KM
Critical implementation factors Decisiveness of local bodies to endure in complete and timely registration, cooperation between institutions in chain of service delivery	
Funding sources	Local administrative bodies, donations
Labor market, human resources, necessary knowledge and skills	To develop applicative solutions, professional IT and legal staff are necessary; for use – standard computer knowledge.
Development environment	Areas where the project is implemented, sufficient interest and political will are necessary to implement relevant activities.
Technologies	Key investment is in the development of applicative software that should be used.
Time lines	According to implementation plan
Implementation monitoring	Periodic monitoring of entries and assurance of information in the database
Risks	Insufficient interest on the part of competent bodies, lack of harmonization of registers between certain participants, insufficiently monitored realistic state of affairs in comparison with the records – information not updated.

48

Type of activity	Project and computer program implementation
Title of activity	Construction licenses computer programs
Stakeholder	Local administrative bodies, entity governments, AIS
Participants	Entity institutions – land register and property relations authorities
Description of activity	Implement computer program to enable electronic registration of requests, automatized request processing procedure and register all issues, certificates and licenses for construction.
Expected outcome	Database on issued certificates for construction, monitoring of collection and rents for issued licenses, prevention of unlicensed construction– resource of complete inspection supervision, cancellation of monopoly and reduction of potential for corruption.
Prerequisites	securing funds, defined concept of inter-operability, document management and processing of cadastre information
Period of execution (timeframe)	2005 - 2007
Financial prognosis	1 200 000 KM
Critical implementation factors Decisiveness of local bodies to endure in complete and timely registration, cooperation between institutions in chain of service delivery.	
Funding sources	Local administrative bodies, donations.
Labor market, human resources, necessary knowledge and skills	Computer program solution development requires professional staff in the field of IT, architecture and law, while the usage requires a basic computer literacy.
Development environment	Areas where the project is implemented, sufficient interest and political will are necessary to implement relevant activities.
Technologies	A key investment is in development of the computer program software to be used.
Time lines	According to implementation plan.
Implementation monitoring	Periodic monitoring of entries and assurance of information in the database.
Risks	Insufficient interest on the part of competent bodies, lack of harmonization of registers between certain participants, insufficiently monitored realistic state of affairs in comparison with the records – information not updated.

48

Type of activity	Project and computer program implementation
Title of activity	Construction licenses computer programs – on-line
Stakeholder	Local administrative bodies, entity governments, AIS
Participants	Entity institutions – land register and property relations authorities, cantonal and entity governments
Description of activity	Annex to the computer program solution for issuing the construction licenses.
Expected outcome	Issuing the construction licenses on-line, reducing crowds in the services authorized for issuing the construction licenses.
Prerequisites	Successfully implemented project of construction license computer programs.
Period of execution (timeframe)	2007 to 2009.
Financial prognosis	1 500 000 KM
Critical implementation factors Inadequate legal regulations, safety aspects of on-line service utilization, expensive and insufficiently fast Internet connection	
Funding sources	Local administrative bodies, donations.
Labor market, human resources, necessary knowledge and skills	IT experts of different profiles are necessary (programmers, web-designers, security experts etc.). Currently, there is no sufficient number of this type of human resources on the labor market. Different projects and potential of professional development should create the climate to develop national staff and not import human resources from abroad.
Development environment	All legal obstacles for provision of on-lice services shall be removed - alignment of electronically generated document (with appropriate digital signature) with the classical document, communication infrastructure, a strong media campaign aimed at encouraging the users to on-lice service utilization.
Technologies	Internet, database technologies, communication technologies, security and data protection technologies. The key point is a reliable utilization of on-line services, i.e. security aspects and appropriate, namely fast and reliable infrastructure.
Time lines	Start of the implementation is related to successful end to implementation of construction license computer program.
Implementation monitoring	Periodic monitoring of the manner of use, i.e. number of on-line users, surveys related to the issue of simplicity of quality and speed of service. Assessment of the implementation in terms of automatization of issuance of construction licenses is to be implemented based on benchmark indicators 1-4, described in Annex 2 of the eGovernance Development Strategy.
Risks	An expensive solution for a potentially small number of users.

49

Type of activity	Project and computer program implementation
Title of activity	Job search
Stakeholder	Entity and cantonal governments, Local administrative bodies.
Participants	Competent ministries and agencies for labor issues, local employment agencies.
Description of activity	Creation of a database on all newly opened job positions.
Expected outcome	Facilitated job search and search for appropriate candidates for a certain job. Decrease costs and time needed for finding an adequate job position or a person, potentially, reduction of unemployment and commercialization of this job in on-line form.
Prerequisites	Secured funds.
Period of execution (timeframe)	2007-2008
Financial prognosis	500 000 KM
Critical implementation factors Lack of interest among participants, outdated records.	
Funding sources	Entity and cantonal governments, Local administrative bodies, donations.
Labor market, human resources, necessary knowledge and skills	There is an adequate labor market, as well as necessary knowledge and skills.
Development environment	Appropriate environment should be developed where all parties interested in merging the labor market could meet (government and non-government sector, private businessmen and individuals). Media campaign promotion of all the advantages and benefits of this project.
Technologies	Connection of individual participants i.e. communication technologies.
Time lines	According to implementation plan
Implementation monitoring	Periodic monitoring of the manner of use, i.e. number of on-line users, surveys related to the issue of simplicity of quality and speed of service. Assessment of the program implementation is to be implemented based on benchmark indicators 1-4, described in Annex 2 of the eGovernance Development Strategy.
Risks	Insufficient interest of authorized bodies, lack of record harmonization among certain participants, outdated information.

50

Type of activity	Project and computer program implementation
Title of activity	Social benefits
Stakeholder	Local administrative bodies, employment agencies
Participants	Competent ministries and agencies for labor issues, private sector
Description of activity	Creation of a database on all social benefits
Expected outcome	An easier access to information regarding the rights to social benefits and manner in which they can be obtained. Database on beneficiaries. Better work transparency.
Prerequisites	Secured funds.
Period of execution (timeframe)	2007 – 2008
Financial prognosis	500 000 KM
Critical implementation factors Lack of interest among the participants	
Funding sources	Entity and cantonal governments, Local administrative bodies and donations.
Labor market, human resources, necessary knowledge and skills	There is an adequate labor market, as well as necessary knowledge and skills.
Development environment	This field requires an appropriate legal and social environment.
Technologies	Connection of individual participants i.e. communication technologies.
Time lines	According to implementation plan
Implementation monitoring	Periodic monitoring of entries and accuracy of information in the database. Assessment of the implementation of social benefits program is to be implemented based on benchmark indicators 1-4, described in Annex 2 of the eGovernance Development Strategy.
Risks	Lack of interest among the participants, outdated information, poor turnout of users.

51

Type of activity	Project and computer program implementation
Title of activity	Social contributions for the employees
Stakeholder	Entity and cantonal governments
Participants	Competent ministries and agencies for labor issues, local administrative bodies, and private sector.
Description of activity	Creating a database on all social contributions for the employees.
Expected outcome	Financial control of social contribution collections. Reducing costs of transactions by electronic payment. Transparency of work.
Prerequisites	Secured funds, legally regulated issues of electronic monetary transactions.
Period of execution (timeframe)	2007 - 2008
Financial prognosis	800 000 KM
Critical implementation factors Lack of interest among the participants	
Funding sources	Entity and cantonal governments, donations
Labor market, human resources, necessary knowledge and skills	There is an adequate labor market, as well as necessary knowledge and skills.
Development environment	Legal regulations should be adjusted to this kind of transactions.
Technologies	A quick and reliable infrastructure with the safe hardware and software techniques for financial transactions.
Time lines	According to implementation plan.
Implementation monitoring	Periodic monitoring of entries and accuracy of information in the database. Assessment of the implementation related to electronic submission of statistics and informatization of the business and operations of statistics agencies/institutes is to be implemented based on benchmark indicators 1-4, described in Annex 2 of the eGovernance Development Strategy.
Risks	Lack of interest – readiness of the participants to switch to this form of payment.

52

Type of activity	Project and computer program implementation
Title of activity	Environment-related licenses.
Stakeholder	Entity and cantonal governments.
Participants	Competent ministries and agencies for labor issues, local administrative bodies, non-governmental ecological agencies, and private sector.
Description of activity	Creation of a database on ecological segments.
Expected outcome	Creation of a unique database which will in collaboration with all other space-related databases provide a complete ecological picture of the state and its ecological needs. Approaching the world and world standards on environment protection.
Prerequisites	Secured funds, legally regulated issues.
Period of execution (timeframe)	2007 – 2008
Financial prognosis	500 000 KM
Critical implementation factors Lack of interest among the participants, dissection of original information.	
Funding sources	Entity and cantonal governments, donations.
Labor market, human resources, necessary knowledge and skills	There is an adequate labor market, as well as necessary knowledge and skills.
Development environment	Legislation should be adapted in this segment. It is necessary to develop a positive social environment in which different ecological movements existing in this region can provide significant contributions.
Technologies	A quick and reliable infrastructure with the secured hardware and software techniques for the financial transactions.
Time lines	According to implementation plan.
Implementation monitoring	Periodic monitoring of entries and accuracy of information in the database. Assessment of the program implementation is to be implemented based on benchmark indicators 1-4, described in Annex 2 of the eGovernance Development Strategy.
Risks	Insufficient interest among the participants.

53

Type of activity	Project and computer program implementation
Title of activity	Information system for the inspection
Stakeholder	AIS, entity and local administrative bodies
Participants	Entity, cantonal and municipal inspection services
Description of activity	Creation of a uniform database on inspection affairs at all levels. It is necessary to establish a basis for computer program of the quality management in administration, applying the information and communication technologies. Creation of the Regulation Register for different fields controlled by the inspection services, which would be kept in electronic form and regularly updated with amendments to the regulations in the respective fields.
Expected outcome	A quick and easy access to data from different fields controlled by the inspection and manner in which the regulations applied. Connecting with the other bodies (courts, police) in the process of data exchange among them. Reduction of corruption and a more transparent work of administration.
Prerequisites	A well-established legislation and clearly defined authorities of the inspection bodies.
Period of execution (timeframe)	2005
Financial prognosis	500 000 KM
Critical implementation factors A poor coordination or lack of interest among the participants	
Funding sources	Entity and cantonal governments, donations
Labor market, human resources, necessary knowledge and skills	There is an adequate labor market, as well as necessary knowledge and skills.
Development environment	The legal regulations in this field (which is rather broad one) should be brought to the level when the computerization and automation of this field is possible.
Technologies	Communication technologies, inter-operability, EDMS
Time lines	According to implementation plan
Implementation monitoring	Periodic monitoring of entries and accuracy of data in the database. Regular reports.
Risks	Slow and inert existing system re-engineering of which requires a high level commitment of all participants may slow down the system introduction, securing of an adequate acquisition of data as a form of mandatory system update, lack of interest – corruption of certain officers.

54

Type of activity	Project and computer program implementation
Title of activity	Register of legal entities
Stakeholder	AIS, entity governments
Participants	Cantonal and local administrative bodies, private sector, chambers of commerce
Description of activity	Creation of a state level database on all legal entities
Expected outcome	Introduction of a uniform register of legal entities would facilitate and speed up financial and any other control, while on the other hand it would reduce the resource of embezzlements and gray economy. Better cooperation among the economic subjects at the local and regional level.
Prerequisites	Secured funds.
Period of execution (timeframe)	2005 – 2006
Financial prognosis	300 000 KM
Critical implementation factors Lack of coordination in the field of legal regulations	
Funding sources	Entity and cantonal governments, donations
Labor market, human resources, necessary knowledge and skills	There is an adequate labor market, as well as necessary knowledge and skills.
Development environment	It is necessary to have a political will and interest in implementation of this activity.
Technologies	The key investment is in software computer program development that is to be used.
Time lines	According to implementation plan.
Implementation monitoring	Periodic monitoring of entries and accuracy of data in the database.
Risks	Insufficient interest among the participants.

55

Type of activity	Project and computer program implementation
Title of activity	Register of domestic animals
Stakeholder	Agency for domestic animal registration
Participants	Competent ministries at the entity and cantonal level
Description of activity	Creation of a database on all categories of domestic animals
Expected outcome	Introduction of a unique Register of domestic animals would provide for easier and quicker inspections of imported animals and protection against infectious and other animal diseases. Better and more complete cooperation with other competent bodies.
Prerequisites	Establishing an agency to be in charge of this field, secured funds.
Period of execution (timeframe)	2005 – 2006
Financial prognosis	700 000 KM
Critical implementation factors Lack of or incomplete records	
Funding sources	Entity and cantonal governments, donations
Labor market, human resources, necessary knowledge and skills	There is an adequate labor market, as well as necessary knowledge and skills.
Development environment	The necessary elements are the political willingness and interest in implementation of this activity.
Technologies	The key investment is in the development of applicative software that is to be used.
Time lines	Implementation of the project should start as soon as possible.
Implementation monitoring	Periodic monitoring of entries and accuracy of data in the database.
Risks	Insufficient interest of the participants, difficult acquisition of data – dissecting and incomplete records

56

Type of activity	Pilot-project
Title of activity	eParticipation
Stakeholder	AIS, entity and cantonal governments, local administrative bodies
Participants	Institutions, NGOs, private sector
Description of activity	Creation of a modern and more democratic participation of citizens in the work of public authorities.
Expected outcome	Promoting greater openness, transparency and accountability of local government officials, an increasing participation of public in terms of examining and decision making of the public bodies.
Prerequisites	Legal regulations, secured funds, a cheap and quick access to Internet
Period of execution (timeframe)	2007 - 2008.
Financial prognosis	900 000 KM
Critical implementation factors Trust of citizens in the institutions and technology. Wining the trust of voters in terms of robustness and secrecy ensured by the technology.	
Funding sources	Entity and cantonal governments, donations
Labor market, human resources, necessary knowledge and skills	There is an adequate labor market, but since in the modern world this form of citizens' participation is a new and insufficiently investigated area, it is necessary to obtain through several small pilot projects the analyses which can tell whether there is resource of applying this in our environment.
Development environment	There shall be political will and interest in implementation of this activity. A strong media campaign aimed at encouraging the users to use these services i.e. potential.
Technologies	An issue of protection of the right to privacy and intellectual property.
Time lines	The project implementation should start as soon as possible.
Implementation monitoring	Periodic monitoring of the manner and frequency of uses of this service. Evaluation of the computer program implementation is to be done based on benchmark indicators 1-4, given in Annex 2 of the eGovernance Development Strategy.
Risks	Digital stratification of the citizens, insufficient interest of the citizens in use of this service.

57

Type of activity	Project
Title of activity	Generic e-Service project
Stakeholder	AIS
Participants	ENT, DISTR, KANT, LOK , universities. Private sector.
Description of activity	Through this project it is necessary to define a uniform concept of e-service management, which will ensure the interaction between (different and specific) computer programs and users in a uniform manner.
Expected outcome	Clearly defined requests, procedures and instructions for transfer from off-line to on-line applicative solutions.
Prerequisites	Financial means and agreement of the stakeholders for implementation of the project.
Period of execution (timeframe)	2005 – 2006
Financial prognosis	250 000 KM
Critical implementation factors - Agreement of the decision makers to implement the project, human resources.	
Funding sources	Donation for administration reform Budget of all bodies
Labor market	This field is characterized by lack of a quality staff.
Development environment	The appropriate media campaign, which would follow the implementation and promote the use of portal.
Technologies	Internet programming, web/internet-standards, web-servers, SECURITY
Time lines	The project should be implemented within the anticipated timeframe. The project is particularly important because it provides a basis for development and implementation of on-line service/computer programs.
Implementation monitoring	Through regular reports.
Risks	Time adjusted to implementation of other segments (infrastructure, portal development, applicative solutions and transfer to on-line service, security). Low Internet penetration, digital literacy of the citizens.

Type of activity	Project – development and implementation
Title of activity	All municipalities on Internet
Stakeholder	Entity governments and government of District
Participants	AIS, municipalities, cities, academic and private sector.
Description of activity	The project would propose a uniform methodology and uniform standards for creation of website for all municipalities, a minimum amount of data and the format of each site, as well as necessary computer and telecommunication equipment. Municipal websites would be implemented on basis of the concept and design of the uniform state portal. Presenting the data on the municipality, municipal administration, economic subjects, culture, tourist potential, education, sports, . . .
Expected outcome	Presenting all municipalities in Bosnia and Herzegovina on the Internet. Better supply of information to citizens, economic subjects and potential investors on all relevant functions, characteristics and potential of individual local communities. A quick access to data and information.
Prerequisites	Adequate financial funds, infrastructure and staff. This project can be implemented only with the agreement of all municipalities.
Period of execution (timeframe)	During 2004 and 2005.
Financial prognosis	Total costs amount to: 1 600 000 KM. Phase-based funding is a resource. There is need for about 200 new computers.
Critical implementation factors Lack of staff, which at the beginning could update the database, the municipalities are not interested in implementation; there is a lack of a uniform standard. Extent to which the citizens' are trained to use the new technologies.	
Funding sources	Donations, entity and cantonal governments, municipalities
Labor market, human resources, necessary knowledge and skills	Basic digital literacy is requirement for all users and staff engaged in updating the databases. There is no need for establishing any new services, but it is necessary to additionally train a certain number of new staff. Each municipality should have at least one employee dealing with informatics.
Development environment	There is a need for the adequate infrastructure, as well as appropriate promotion and media campaign.
Technologies	Majority of investments should be invested into hardware. Standards should be proposed and appropriate template made, to be used by all municipalities.
Time lines	According to implementation plan.
Implementation monitoring	Through regular reports
Risks	Lack of a quality staff. Problem of updating the information. Rent of the lines and space at providers'.

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Type of activity	Project
Title of activity	National portal
Stakeholder	AIS,
Participants	ENT, DISTR, KANT, LOK, All organizational units of the administration, private sector.
Description of activity	This project should realize the National portal as the entry point, which will provide access to all relevant information and electronic services of the public administration. National portal should have connection to hyperlinks structured by organizational and functional segments of public administration. It should provide for the portal to be accessed from the work, home, mobile phones or public information kiosks.
Expected outcome	An optimistic presentation and better image of Bosnia and Herzegovina, attracting foreign capital, a quick and efficient access to information (availability of relevant documents in electronic form), and services of the public administration, and increased work transparency.
Prerequisites	Funds and agreement of the activity stakeholders for implementation of the project.
Period of execution (timeframe)	01. 06. 2004 – 01.12. 2005
Financial prognosis	1 000 000 KM
Critical implementation factors - Agreement of the decision makers for implementation of the project - Establishing the organizational unit within PR office that would be in charge of Internet marketing and updating information on the portal. - Collaboration of all stakeholders and participants.	
Funding sources	- Donation for administration reform - Budget of all bodies
Labor market, human resources, necessary knowledge and skills	Basic digital literacy is requirement for all users and staff engaged in updating the databases. There is no need for establishing any new services, but it is necessary to additionally train a certain number of new staff.
Development environment	The appropriate media campaign, which would follow the implementation and promote the use of portal.
Technologies	Internet, web-servers, databases, security
Time lines	The project should be implemented within the anticipated timeframe.
Implementation monitoring	Through regular reports. Evaluation of the quality of implementation of the Internet portal can be obtained directly through analysis of benchmark indicators 1-4, given in Annex 2 of the EGovernance Development Strategy
Risks	Permanent work on securing the information update. Dissatisfactory development of on-line services.

10. MONITORING INFORMATION SOCIETY DEVELOPMENT (BENCHMARK PROCESS)

Monitoring development and implementation of eGovernance is of key importance from the aspect of evaluation of planed activity success as well as from the aspect of positioning Bosnia and Herzegovina in relation to other countries, in particular EU countries. During the introduction of eGovernance monitoring, evaluation and reporting mechanisms should be implemented at different levels in order to obtain not only an overview of development of certain parts of administration and the system as whole but also to get a clear picture and evaluation of the individual project implementation. In this way, one shall obtain necessary parameters for eventual update of the Information Society Development Policy and the eGovernance Development Strategy. Benchmark results are the only reference to the assessment of eGovernance development, and will be therefore based on reliable reports and information sources such as BiH Institute of Statistics, Entity statistics institutions, NGOs, Eurostat and others. Benchmarking should be based upon adopted EU methodology and indicators (Euro barometer) and other renown institutions such as ITU, SIBIS, and experiences (primarily through eEurope+ initiative) of the countries entering European Union. In a separate project, it is necessary to develop and define a group of data to be collected by statistics institutes and institutions, precisely elaborate the methodology, content and timeframe of benchmarking reports, and list the institutions (state and/or independent) that would participate or would be consulted during preparation of a benchmark report.

These reports should include at least eEurope 2005 benchmarking indicators for eGovernment and monitoring of *basic public services* referring to the fields encompassed by eGovernance Strategy. These fields are:

Services related to citizens	Services related to companies
Income taxes	Social contributions for employees
Job search	Corporation taxes
Social benefits [1]	Turnover tax
Personal documents[2]	Registration of new companies
Car registering	Submitting data to the statistical institutions
Construction license computer programs	Custom declarations
Police reports	Environment-related licenses
Birth certificates/marriage certificate	Public procurements
Change of permanent address	

The key indicators of implementation progress of eGovernance are: percentage/level of availability of basic public services that can be used on-line, and percentage of (individual and business) Internet users of public services.

In order to measure a percentage wise availability of basic public services that can be used on-line, European Commission adopted four levels of a-service state:

- Level 1 – Information: on-line information on public services
- Level 2 – Interaction: obtaining (downloading) computer program forms.
- Level 3 – Two-way interaction (form processing, including verification of authenticity)

[1] Service called "Social benefits" is evaluated on basis of the following sub-services: unemployment benefits, child's allowance, prices of health services and student scholarships, where the last two sub-services will be implemented within the development units eHealth and eEducation.

[2] Service called "personal documents" is measures on basis of sub service: passports and driving licenses.

- Level 4 – Transactions (resource of a full request processing, followed by electronic payment and delivery of a decision).

Apart from these four levels there is also a zero level, which includes:

- A complete absence of any publicly accessible website, and
- Publicly accessible website exists but it does not offer relevant information, interaction or transaction regarding the aforementioned services.

All aforementioned levels are not relevant to all basic services; in fact, one shall define a maximum level that each service can reach. Each new level brings an extra score. The calculation implies comparison of the result amount of all services with the amount of maximum possible results. In this way one can calculate percentage-wise the achieved level of public service development.

Apart from aforementioned indicators, one shall follow the additional statistical indicators, in accordance with [RSE 5197/03] and [CC 21 Nov 2002]:

- Percentage of individuals and business systems utilizing the public electronic systems by categories: obtaining information, obtaining forms, filling the form and a completely automated procedure of dealing with the case,
- Number of public services integrated into administrative ('back office') processes,
- Percentage of computerization of public procurement procedure,
- Percentage of open software utilization in public administration.

Furthermore, the evalvation of individual services and success of individual projects requires definition of additional ways of service evalvation and development level of eGovernance on basis of existing methodologies (IDA methodology with criteria: availability, usability and delivery of a service; SIBIS indicators: attitude of an individual and companies towards use of electronic services, experience in use of electronic services and preference for their usage, trust in electronic service SECURITY; Bertelsmann Stiftung: BEGIX – balanced eGovernment index, etc.).

Security of electronic transactions is of key importance for success of automated electronic procedure implementation; therefore one shall have an insight into state of security of eGovernance infrastructure. A poor computer program of electronic services may be result of inadequate infrastructure security i.e. a problem of stealing and misusing payment cards, misuse of personal and business information, spreading a computer virus, unauthorized change of information, etc. Therefore, one shall follow the following security indicators:

- Percentage of individuals with Internet access which had security difficulties working with eGovernance,
- Percentage of business systems with Internet access that had security problems in work with eGovernance.

Note: According to EU benchmarking standards, these indicators are followed for overall use of information and communication technologies in all segments of society. It would be extremely useful to have a pond indicator on basis of which one can estimate the security level of eGovernance.

Availability and faster penetration of a broadband access is a necessary precondition for success of goals set by eEurope Initiative. For that reason, eEurope 2005 indicators include monitoring of broadband access penetration in different segments of society, including the indicator of a broadband access in public administration. Additional indicators are used to obtain the data on type of broadband access (xDSL, satellite, fixed - wireless, UMTS etc.).

A detailed description of benchmarking indicators is given below.

Indicator definition	1. Number of basic public services available on-line. There were 20 basic public services identified by Internal Market/Consumers/Tourism Council on March 12, 2001 for the first *E*urope benchmarking-process.

Importance of the indicator	This indicator directly shows the level of eGovernance development. Based on comparison of other countries in Europe, one can determine a level of modernization of public administration in light of information society development and readiness of Bosnia and Herzegovina to integrate into EU.
Source of information and description of indicator computing	EUROSTAT, EUROBAROMETAR, SIBIS The measuring is done only for basic pubic services (see Chapter 6 of the Strategy). Percentage/level of availability of basic public services is determined on basis four levels of e-service state: • Level 1 – Information: on-line information on public services • Level 2 – Interaction: obtaining (downloading) computer program forms. • Level 3 – Two-way interaction (form processing, including verification of authenticity) • Level 4 – Transactions (resource of a full request processing, followed by electronic payment and delivery of a decision). Having determined methodology one can calculate, percentage wise, the achieved level of public service development. For details see SIBIS, Table 3.3 - 48: On-line availability of government services for citizens, and Table 3.3 - 56: Availability of on-line government services for businesses.
Data collection	BiH Agency for Statistics, Institute of Statistics of RS, Bureau for Statistics of the Federation of BiH, NGOs, Eurostat and other.
Incidence	Annually, first in the first quarter of 2005. Complete definition is established by resolution of Council of Europe on January 28, 2003.
Correlated indicators	CoE Resolution on monitoring of computerization of public administration also defines additional indicators: A. Percentage of individuals using the Internet for interaction with public administration (recorded by class: obtaining information, obtaining computer program forms, returning of completed computer program forms); B. Percentage of business systems using the Internet for interaction with public administration (recorded by class: obtaining information, obtaining computer program forms, returning of completed computer program forms, completely computerized processing of requests). The next additional indicator is subject of a pilot-study on their suitability and importance in European Union. Eventually, monitoring of these indicators in Bosnia and Herzegovina would be implemented after obtaining the experience and recommendations by EU. - Number of public services integrated to 'back office' processes. - Percentage (by value) of public procurements that were completely implemented on-line - Percentage of public services using open source software.
Wight factor of the indicator	5
Indicator validity	-
Indicator availability	3

Indicator definition	2. Evaluation (IDA methodology) of electronic services. Evalvation of electronic services works on basis of following criteria: ▪ Service availability ▪ Service usability ▪ Service supply This evalvation scheme is designed to collect a total of 100 points. The achieved results show the maturity level of the service.
Importance of the indicator	This indicator is extremely useful for quality evaluation of some electronic service.
Source of information and description of indicator computing	*Service availability (20 points)* ▪ Easy to find – access to service for local users (max 10 points) ▪ Easy to find – access to service for foreigners (max 5 points) ▪ Actual resource for use of service abroad (max 5 points) *Service usability (30 points)* ▪ Covering the real users' needs (max. 10 points) ▪ Easy to understand – and learn (max. 2,5 points) ▪ Easy to use (max. 2,5 points) ▪ Provides less users' mistake (max. 2,5 points) ▪ Attractive appearance of the site – pleasant to use (max. 2,5 points) ▪ Presentation in 1-2 EU languages (max. 5 points) ▪ Presentation in 3 or more EU languages (max. 5 points). *Service supply (50 points)* ▪ Service completeness (max. 30 points) ▪ Quality of service provided (max. 20 points)
Data collection	BiH Agency for statistics, Bureau for Statistics of RS, Bureau for Statistics of the Federation of BiH, NGOs, Eurostat and other.
Incidence	Annually, first in the first quarter of 2005
Correlated indicators	-
Wight factor of the indicator	4
Indicator validity	-
Indicator availability	4

Indicator definition	3. Knowledge of citizens and business systems on availability of on-line public services Percentage of regular Internet users aware of existence of on-line public administration services.
Importance of the indicator	This indicator is very important because success of eGovernance concept depends on resource of access, which is the focus of this indicator.
Source of information and description of indicator computing	SIBIS A detailed description of calculating the indicators is given in SIBIS Table 3.3 - 49 and Table 3.3 - 57.
Data collection	BiH Agency for statistics, Bureau for Statistics of RS, Bureau for Statistics of the Federation of BiH, NGOs, Eurostat and other.

Incidence	Annually, first in the first quarter of 2006
Correlated indicators	• Citizens' knowledge on availability of on-line public services for tax payment, • Citizens' knowledge on availability of on-line public services for job searching in public institutions • Citizens' knowledge on availability of on-line public services for filing the passport requests, requesting birth certificates, personal documents, car registration, etc. • Citizens' knowledge on availability of on-line public services for police reporting, for example, reporting a theft • Citizens' knowledge on availability of on-line public services for book search in public libraries • Citizens' knowledge on availability of on-line public services for registering the change of residence • Knowledge of business systems on availability of on-line public service for paying the employees' contributions. • Knowledge of business systems on availability of on-line public service for tax reporting • Knowledge of business systems on availability of on-line public service for providing statistical data • Knowledge of business systems on availability of on-line public service for obtaining licenses for environment protection • Knowledge of business systems on availability of on-line public service for participation in public tenders
Wight factor of the indicator	3
Indicator validity	-
Indicator availability	3

Indicator definition	4. Use of public on-line services by citizens and business systems. Percentage of regular Internet users who visit on-live services of public administration.
Importance of the indicator	This indicator is very important because success of eGovernance primarily manifests in actual use and access made by citizens and business systems.
Source of information and description of indicator computing	SIBIS A detailed description of the indicator computing is given in SIBIS Table 3.3 - 52 and Table 3.3 - 58.
Data collection	BiH Agency for Statistics, Institute Statistics of RS, Institute of Statistics of the Federation of BiH, NGOs, Eurostat and other.
Incidence	Annually, first in the first quarter of 2007

Correlated indicators	• Citizens' experience in use of on-line public service for tax payment • Citizens' experience in use of on-line public service for job searching in public institutions • Citizens' experience in use of on-line public service for filing requests for passports, birth certificates, personal documents, car registration, etc. • Citizens' experience in use of on-line public service for police reporting, e.g. reporting a theft • Citizens' experience in use of on-line public service for book search in public libraries • Citizens' experience in use of on-line public service for registering the change of residence • Experience of business systems in use of on-line public services for paying the employees' contributions. • Experience of business systems in use of on-line public services for tax paying Experience of business systems in use of on-line public services for providing statistical data • Experience of business systems in use of on-line public services for obtaining licenses for environment protection • Experience of business systems in use of on-line public services for participation in public tenders
Wight factor of the indicator	3
Indicator validity	-
Indicator availability	3

Indicator definition	5. Indicator of information infrastructure security. Percentage of regular Internet users (individuals/business systems).
Importance of the indicator	This indicator is important because SECURITY of transactions and communication is of key importance for computer program of information and communication technologies and information society development of eGovernance. Security problems are usually manifested as misuse of electronic cards, damage caused by virus, misuse of personal data, illegal acquisition of business information.
Source of information	Eurostat/NSI ICT
Data collection	BiH Agency for Statistics, Institute of Statistics of RS, Institute of Statistics of the Federation of BiH, NGOs, Eurostat and other.
Incidence	Annually, first in the first quarter of 2005
Correlated indicators	• Percentage wise misuse of electronic cards in relation to the total number of misuses. • Percentage of problems caused by computer viruses, which resulted in damage in relation to the total number of misuses (for business systems broke down by the size of system) • Percentage of unauthorized entries into computer systems in relation to the total number of misuses.
Wight factor of the indicator	4
Indicator validity	-
Indicator availability	4

ICT Infrastructure

11. ACTION PLAN

11.1. ACTIVITY DYNAMICS

The dynamics of activities are divided into the following three segments:

- Activities that relate to the period up to the liberalization of the telecommunication market;
- Activities that relate to the period after 2005, i.e. the time of complete liberalization of the telecommunication market, and
- Strategic development activities for the period of 2007 – 2010.

11.1.1. NECESSARY ACTIVITIES THAT CAN BE EXECUTED QUICKLY

The program of activities that need to be performed immediately relates to the period of 2004/2005. This is the period preceding the complete liberalization in the telecommunications sector, that includes swift preparations by all relevant subjects for the new conditions of operations. As this period is a short one, and includes major changes, such as the rebalance of tariffs, defining the financing of universal services, VoIP and IP telephony, detangled local loops, interconnections, etc. Dominant operators are faced with changes due to market orientation, instead of earlier monopolies. The society is faced with challenges of the service development and the infrastructure that has to be provided. A regulatory agency with the need to regulate and coordinate all the processes and changes for the organization of the market, etc. It is clear that the society, and companies are faced with true challenges.

With the aim of rationalizing the expenses, the creation of general solutions needs to be encouraged, solutions that can satisfy the needs of various institutions and services. A large number of operations related to the development of electronic management and digitalization of various contents can and need to be organized by hiring professional companies that have to follow the set organizational and technical standards. This will prevent the profuse growth of the state administration, and stimulate the competition, which will in turn result in the reduction of costs of the realization of activities.

Effective application of information and communication technology is based on organized legislation and regulation, which is why the legislation needs to be harmonized with that of developed countries. This is a long lasting work which, however, can be executed by an efficient and sound state administration. The prerequisites for successful realization of the strategy is to establish four mechanisms for: the planning of activities for the realization of strategy goals, management of strategy implementation, strategy promotion and the control of realization of planned activities and set goals. The planning of activities for the realization of strategy goals will be based on the recommendations and the ICT.

The promotion of plans is necessary to ensure its acceptance by the citizens and companies. They need to be informed about the possibilities of the ICT and persuade them to become active participants in the creation of the information society. They also need to be familiar with the obstacles and dangers on the road towards the realization of goals. Monitoring the planned activities and realization of the set goals on behalf of citizens will be conducted by the board for the information society technologies of the Council of Ministers. This can help improve purposeful and rational use of the tax payers' money, and, to a great degree, prevent the abuse of the IC infrastructure.

Realization of the strategy goals will bring multiple benefits to the citizens. The unemployment rate will decrease, with the number of young and educated people who emigrate. The possibilities and quality of education will improve, comprehensive education will be possible, along with learning and acquiring skills through the Internet. Citizens will have access to basic public data, and public services. The quality and speed of providing services to citizens by the state administration will improve, and the increase

of the efficiency of the state administration operations will in turn provide for rational use of funds provided to the state by taxpayers.

The citizens will be able to communicate more easily, they will have better access to information and services, they will be able to perform their work and purchases, banking and other transactions without having to leave homes. The access to health information and using health care services, as well as cultural content will be made much easier. It will be possible to access the ICT infrastructure at public places, such as libraries, schools and community centers.

11.1.2. MIDDLE-TERM ACTIVITIES

The deadline for the middle-term plan is 2007. Even though this is a period in which BIH still remains a candidate for joining the EU, many preconditions need to be realized by that time. This set of activities includes all the work on realizing the plan for the informatisation of Bosnia and Herzegovina, that will enable it to join the EU. Defining the scope of these activities includes organizing the telecommunication market in accordance with the European standards. This includes building the telecommunication backbone network of a capacity sufficient to withstand all the expected traffic. It also includes adjustments in the sense of technical conditions for interconnections and the establishment of the VPN networks. These are technically coordinated interfaces and protocols for the connection to the common Backbone Information Highway and the establishment of the necessary environment for security and privacy that would enable functioning of all types of electronic business operations. It also includes rebalancing prices and tariff models for the fixed, mobile, package networks, the Internet and other with the world market values.

In many state institutions and public services there are information systems with databases linking, netting and use of which, supported by appropriate legislation, would bring significant improvement to the operation of the administration and public services. This is not enough. It is also necessary to establish the departments and offices for operations on a single, non-discriminatory basis, at all levels of authority.

11.1.3. LONG-TERM ACTIVITIES

Even though the year 2010 can be considered distant, this deadline can still be considered a middle-term one. This is the period in which Bosnia and Herzegovina could already be a part of the EU. This deadline, therefore, presents the time by which all the set goals necessary for normal joining and functioning in the new community are to be accomplished. As these tasks are extremely complex, they need to be treated will full respect and responsibility. This is a group of activities of long-term or, better yet, long-lasting character, just like the strategic approach to the activities that are an integral part of the planning process. These recommendations and actions need to be elaborated into feasible plans that include detailed plans of activities, agents and deadlines for realization, as well as necessary funds. The management of plan realization should be placed with the state council of information society technologies, an adequate professional body with a chairman, that will provide for the participation of experts and politicians, which is necessary for successful realization of plans. All the available resources will be used for the realization of the strategy.

A major part of the strategy, resulting recommendations and activities, is dedicated to the next generations. Primary and secondary education needs to include gaining knowledge of information and communication technology that will enable the young people to understand the basics of the technology. This will enable them to work with the technology, and thus enable them to meet the basic requirements for competing in the labor market. The same goal can faster be achieved with the help of more comprehensive general education, with much greater independence of students in the

educational process, by stimulating their analytic and critical reasoning abilities. Such education will make it easier for the young people to study in a independent and comprehensive way, which will, in turn, enable them to adjust more easily to switch work places, that will become even more frequent in future. Young people with university education will be trained to use the ICT in their professions. They will, at the same time, gain sufficient understanding of the technology basics, which will facilitate their use of new tools that will develop.

The longest lasting activities that are the preconditions to achieve the strategic goals are related to education. It must be noted that our ICT experts are highly appreciated in Europe and the world, and perform the most complex research, development and production activities. However, their annual production does not suffice even for the current demands, and much less for later expansion of activities. We neither have nor educate a sufficient number of quality, or top managers to work with high tech. We must not fool ourselves that these problems can easily be solved by quick and mediocre education; what we need is a thorough and fast reform of the school system.

Neither here, nor in university education, big new investments are necessary, but the students and the faculty needs to be directed towards the ICT and thus coordinate the education of experts with the demand at the local labor market. This will in turn decrease the number of unemployed young experts. At the same time, by redirecting funds to science, in accordance with state priorities, and better connections among the fundamental, applicative and development types of research, we can start ensuring long-term support to the development strategy.

In the primary and secondary education, we need to modernize the curricula, and organize the systematic training for teachers so that they would be able to use the new curricula. The greatest expenses will be caused by providing equipment for educational, scientific, cultural and health care institutions, creation of electronic government and public services, and the digitalization of cultural, national, educational, health care and business content.

11.2. Activity Action Plan

With the increase of state traffic and transit traffic through Bosnia and Herzegovina, the introduction of new optic fibres in the North-South direction has become a rational solution. The share of optic fibres in the access network is not great, due to the commutation of channel mode and poor development of the Internet. In the following period, we need to be more aggressive with regard to building broadband access networks, in two directions, one of which relates to the advancement of the existing copper lines using the xDSL technologies, and the other for new access networks that reaches the user with an optic line. The use of hybrid technologies is to be planned to the largest number of private users, and the use of all-optic technologies for business ones.

11.2.1. The Year 2004

As early as in 2004, we need to initiate the process of drafting laws and regulation if we intend to harmonize the law with the new situation by January 1, 2006. The free market demands certain technological and organizational preparations. In accordance wit the new Law on Telecommunication, we need to prepare adequate books of regulations, while paying attention to the following:

- Sharing resources among operators – to maximum precision determine what resources need to be shared, can be shared or must not be shared by operators;
- Ban the sharing of resources on the basis of which the market compares, distinguishes and identifies the operators. Those are, namely, the elements thanks to which operators compete with one another. For example, a core network is such an element, since the quality of the core network directly affects

the quality of service. Two operators sharing a core network offer the same quality of service, even the same prices to the market, with which they trade their competitive relation to that of partners, which can cause the decrease of the quality of services and the increase of prices;

- In addition to sharing the LLU and other allowed aspects of competitive relation, operators should share the resources that damage the environment in the ecological, visual or any other way. Those could be antenna posts or structures, corridors, etc;
- Operators should have a legal obligation to submit up-to-date data on the traffic, installed capacities, financial data, etc. on a regular basis. The information shall be used by the regulator for the purposes of "supervision" of the market, taking corrective actions as required. Delivering false data or the abuse of the received information shall be sanctioned.

Licensing, apart from providing income to the budget, limits the access to the market, and, as such, presents the most powerful regulative element of the market. By the introduction of licensing, the operators are put in a less favorable position than other areas of economy with no licensing requirements. By termination of licensing, the conditions for sounder competitive relations would be created at the market. The regulation should envisage the possibility of decreasing or termination of the licensing fees, in the following way:

- In appropriate regulation carefully determine the amounts of licensing fees for fixed operators, GSM operators, UMTS operators (with prior analysis of the state and adequate analytics to measure the real value and license fee), CATV operators that in addition to the basic service offer the voice and broadband services, and ISPs;
- Enable more efficient licensing, and an open, undiscriminating and transparent procedure;
- No limits for the number of licensing for fixed network operators;
- Fixed network does not use limited resources (e.g. the area of radio frequencies).

The creation of competition in the market of fixed electronic communication services needs to be encouraged by the introduction of new fixed operators to the BIH market. In that sense, the following needs to be done:

- Detect potential local and regional fixed network operators (e.g. among the CATV operators);
- Approach the licensing procedure that shall result in defining the awarding of UMTS concessions in the fourth quarter of 2004 (in which case, the operation of the first UMTS can be expected to start in the second quarter of 2005);
- With the available space for the third GSM operator at the market, publish an add for the approval of a GSM or a combined GSM/UMTS license and thus resolve the issue of unlicensed operation of the current third operator by the middle of 2004.

11.2.2. THE YEAR 2005

The Government is bound by a contract to protect the monopoly of the dominant operators in some segments of activities (choice and pre-selection of the operator, LLU), by June 30, 2005. After that date the market can become an open one. The market participants must be given a sufficient amount of time to prepare, which is one of important reasons that stipulate timely adoption of regulation.

Models:

- Fixed price for desired time of use;

- Fixed price for a limited time of use (experience shows that the average time of the Internet use in accordance with an even model is 30 hours);
- Analyse technical models of measuring call charge with flat rates (the point of measuring is with the ISP, and with the operator, the call charge is measured at both points, the call goes through the intelligent network, etc.);
- Stimulate the development of new broadband technologies that enable quicker access to tge Internet;
- Introduce the use of Internet services with the state and public service;
- Competition in the area of fixed telephony will increase the quality and decrease the price of the Internet use;
- Advance the security of web transactions by establishing legal framework (the Law on Digital Signature, the Law on Digital Documents, etc.);
- Encourage the development of local activities;
- Expand the set of basic services by adding new ones (e.g. Internet access services).

Advance the business procedures of ministries, regulatory agencies and organizations that support them (this has partly been treated in the Item on the draft law and regulation).

Build the legal and organizational mechanisms that will provide the Government with the overview of the state of the telecommunication market. Only the up-to-date information is true information, on the basis of which the Ministry and the Government can make correct and timely decisions and take appropriate corrective actions. With that aim, operators need to be prescribed the obligation to deliver up-to-date information. The actual type of data needs to be prescribed by a book of regulations (e.g. on the traffic, installed capacities and changes to it, the number of users, basic financial indicators, plans, etc.). A part of the data represents business secret to the operator, which is why the purpose and method of the use of the data needs to be defined, along with the sanctions for providing false data or their abuse. The Ministry may delegate the collection and processing of the data to an independent body. The Ministry and organizations that provide it with professional support, as well as appropriate departments within the Standardization Office should permanently be provided with up-to-date information from the electronic communications market.

The existing regulatory framework is oriented towards the creation of market competition and the reduction of monopoly by the existing operators, and less towards the stimulation of investments in the telecommunication infrastructure and telecommunication services. This is why the establishment of a state broadband network infrastructure, which will become vital state infrastructure, together with roads, railroads, etc, should become one of top priorities in the development of telecommunications.

11.2.3. THE YEAR 2006/07

Standardization of interfaces, protocols and signalization in digital systems is very dynamic today; there are so many standardization and *de-facto* standardization bodies. Producers often produce equipment that does not comply with the generally accepted international standards, or does so only partly. By selling such non-standard or partly standard solutions, the producers make entire market segments dependent on them, and thus prevent competition. It is necessary to consider whether there are legal grounds and whether it makes sense to define interfaces and protocols and thus prevent the creation of “technical” monopolies.

Standardization and regulation in telecommunications depend on one another – regulation without standards and standards without regulation have no value. The

operations of the standardization bodies and bodies that pass and implement legislation and regulation in the area of telecommunications need to be coordinated. Coordinated activities remove all misunderstandings and facilitate the work of state authorities that do not focus on telecommunications. An example of that is presented by customs authorities that will allow the imports of certified products without difficulty, and certificates are issued for equipment that meets the prescribed standards. Consequently, the standards need to be follow market activities, perhaps even precede them.

Investing in broadband networks will then encourage the development of new, innovative, applications and contents. The development of services, applications and contents will create advantages to users, quicken the economic growth of the country and increase business productivity. Encouraging the creation and development of the broadband network should present one of top priorities in the development of telecommunications. The recommendation is to establish a task force and initiate a project that will define most appropriate broadband technologies, as well as models for the most appropriate implementation of the state broadband network. It is necessary to elaborate the models of for service price calculation, connection costs and prices of line leasing, as soon as possible. The prerequisites for mass use of the Internet need to be created. Some useful actions could be the following:

- Decrease or abolish the tax, or future added-value tax, on the subscription for the use of the Internet and the telephone line up to the Internet connection;
- Decrease or abolish the tax, or future added-value tax, on the purchases of PCs;
- Decrease or abolish the tax, or future added-value tax, on subscription for some categories of citizens. The Government should compensate the ISP;
- Define in the regulation the models of interconnection and settlements between ISPs and operators;
- Analyse the flat rate models for dial-up Internet access;
- By the end of 2006, users of broadband services will present 11% of the total number of Internet users, and in some countries of Middle and East Europe up to 20-25%. Introduction of xDSL services, cable modems and fixed wireless access will demand more capacity from the ISPs, mobile Internet, etc.;
- In addition to the traditional Internet access, a major increase of the users of mobile networks will cause the increase of mobile Internet, new services and applications.

Middle and East Europe market is becoming increasingly open to new services and applications that require broadband networks. The most significant influence over the requirements in relation to mobile capacities is exerted by the services of IP VPNs, services of data transfer for the business sector and video services.

With the introduction of broadband services, the most significant defect will present insufficient permeability in local and metropolitan area networks, insufficiently developed state core networks and the development of local contents.

In order to satisfy the needs of high-speed data transfer services in urban areas, new access networks have developed on the basis of Ethernet technology, that enable transfer speed in Gbit/s. Ethernet network provides the following services to businesses:

- LAN services and
- IP VPN services.

In addition to great advantages, such as simplicity and a significantly lower price, modern public Ethernet networks have some deficiencies, such as:

- Scalability of capacities,
- Time of recovery, and

- End-to-end service quality.

The establishment of optic local networks for business and residential users will be initiated somewhat later on, due to the following reasons:

- Great demand for the upgrade of the local network with the ADSL technology,
- High installation costs for optic infrastructure, and
- Quick changes in optic technology during several past years.

11.3. DETAILED PROJECT DESCRIPTION

Type of activity:	Project	
Name of activity:	ICT Highway	
Executor of activity:	Council of Ministers and entity governments	
Participants:	a) Positioned 3 TK operators in BIH b) Electrical Power Company, Railroad Company (additional and alternative solutions). State Projects: CIPS, State Border Service, Customs Administration etc. c) Institute for Traffic, Universities – Faculty of Electrical Engineering and the Faculty of Traffic and Communications d) Independent Consulting Company	
Description of activity:	The Project would suggest the solution for the creation of a single ICT Highway at the level of BIH, with respect to the current state of highway networks of the currently licensed operators, as well as of great systems of economy infrastructure, that have functional line systems. The Highway would be executed using the latest technology, most probably the IP/MPLS technology	
Expected results:	The ICT Highway would connect the entire territory of BIH. It would ensure technical and technological unity of BIH communications and sufficient capacity for the flow of all types of data and information of the computerized BIH society.	
Components:	Component 1	Conceptual solution, projects.
	Component 2	Physical infrastructure of optic fibers, transfer technology and standard protocols.
	Component 3	Interconnection, international directions, loops, routers, and add-drop types of connection points.
Prerequisites:	Agreement/decision at the level of the Council of Ministers of BIH on the rationalization of establishing the communication infrastructure at the level of BIH.	
Execution deadline:	2004, 2005/2006	
Financial projection:	Drawing up of the project 100.00, and circa 5 million KM for realization	
Critical implementation factors Permits, property-right activities, harmonization of mutual divisions in the directions of infrastructure.		
Source of funding	The funds should be provided by the positioned TK operators, available funds of other organizations, including the existing infrastructure of other organizations.	
Labor market, human resources, necessary knowledge and skills	There is sufficient staff to realize the project.	
Development environment	Regional and state context to the project	
Technology	Ethernet though optics is the IP/MPLS alternative	
Time specifics	2007 is the final deadline for project implementation in the entire country.	
Realization monitoring	Project realization, project dynamics, harmonization of international directions, etc.	
Risks	Harmonization of segments of common interests in specific directions.	

Type of activity:	Pilot-project	
Name of activity:	IP-Telephony	
Executor of activity:	Three positioned TC operators in BIH	
Participants:	a) Regulatory Communications Agency b) Mobile operators in relation to the application of IP for GPRS, EDGE Internet access. c) Institutes, professional associations, consulting companies, Faculty of Electrical Engineering and the Faculty of Traffic and Communications	
Description of activity:	The Project would include the installation of equipment in a configuration that would enable IP telephony, both at state and international level, in all modes of voice transfer via IP network (VoIP).	
Expected results:	Gaining experience on possible volume and quality of the IP telephone connection. Gaining experience in developing multimedia services that the VoIP will be an integral part of. Resolution in favor one of 4 basic VoIP models. And other alternative solutions of IP.	
Components:	Component 1	Selection of the solution and contractor.
	Component 2	Project implementation.
Prerequisites:	Justifiability of harmonization of the technical solution at the state level.	
Execution deadline:	2004, 2005/2006	
Financial projection:	Drawing up of the project 50.00, and circa 3 million KM for its implementation.	
Critical implementation factors Selection of contractor, alternative solutions and solution harmonization. Testing in laboratory environment.		
Source of funding	The funds should be provided by the positioned TK operators, with possible assistance of some international organizations that provide assistance to developing countries, as organized by the positioned TK operators.	
Labor market, human resources, necessary knowledge and skills	There is sufficient staff to realize the project.	
Development environment	Infrastructure and interest of other motivated participants, especially of service providers.	
Technology	IP equipment and infrastructure.	
Time specifics	Conditioned, this is an important segment for eEducation, eHealth and eBanking.	
Realization monitoring	Solutions review, coordinated dynamics.	
Risks	Possible risks of imposing solutions by some foreign companies to take control of the market.	

Type of activity:	Project/Pilot-project
Name of activity:	DTM Network – Pilot-Project of introducing new network technologies – DTM for integrated service networks
Executor of activity:	Three positioned TC operators in BIH
Participants:	Institutes, professional associations, consulting companies, Faculty of Electrical Engineering and the Faculty of Traffic and Communications

Description of activity:	The Project would, on the basis of analysis of the state of networks and possibilities of new network technologies and integrated networks of the future, that uses the best segments of networks with channel commutation and package commutation, suggest the solution to gradually introduce it. DTM network is basically an optic fiber network, with the option of reserving capacities by users, and with support for dynamic relocation of capacities by operators. A pilot-network would be configured either as a DTM solution of the transport network for the Internet access by residential users and small and medium enterprises, or as the solution of transport support for mobile network, or a solution for corporate networks.	
Expected results:	Gaining experience in using DTM technology. Possible resolution for the strategy and steps to introduce this integration technology in the public operator and service provider network, that becomes flexible, with dynamic management.	
Components:	Component 1	Preparation and review of project solution.
	Component 2	Pilot-project for laboratory technology tests.
Prerequisites:	Determination of the operator for experimental of introduction of technologies of dynamic simultaneous transfer mode to transfer systems.	
Execution deadline:	2004, 2005/2006	
Financial projection:	Drawing up of the project 50.000KM, and circa 1 million KM for its implementation.	
Critical implementation factors Selection of technology and contractor.		
Source of funding	The funds should be provided by the interested positioned TK operators.	
Labor market, human resources, necessary knowledge and skills	There is sufficient staff to realize the project.	
Development environment	Infrastructure.	
Technology	Laboratory equipment.	
Time specifics	Cannot be set at this point of time.	
Realization monitoring	Review and testing.	
Risks	Cannot be foreseen at this point of time.	

Type of activity:	Project	
Name of activity:	VPN Network – VPN service introduction project	
Executor of activity:	Three positioned TC operators in BIH – Electrical Power Company, Railroad Company.	
Participants:	a) Institutes, professional associations, consulting companies, Faculty of Electrical Engineering and the Faculty of Traffic and Communications b) Government organizations, health care institutions, universities, schools, libraries, business companies, banks and insurance companies, police…	
Description of activity:	The Project would propose the method of solution to the creation of virtual private networks of various types, adjusted to users.	
Expected results:	Increase in the level of knowledge of employees in the aim of quality development of high-value services, acceptable to users, using IP and MPLS technologies.	
Components:	Component 1	Security aspects of solutions in relation to authentication, identification, authorization…
	Component 2	Selection of technology, protocols, encryption, tunneling…
Prerequisites:	Decision by the operator to commence with providing services of the VPN type.	
Execution deadline:	2004, 2005/2006	
Financial projection:	Drawing up of the project 50.000, and circa 1+20 million KM for its implementation.	
Critical implementation factors Establishing some additional applied systems for education, health care, trade, etc.		
Source of funding	The funds should be provided by the positioned TK operators, institutions, donations, etc.	
Labor market, human resources, necessary knowledge and skills	There is sufficient staff to realize the project.	
Development environment	EU experiences are welcome.	
Technology	Ready software solutions.	
Time specifics	Adjust the implementation to the development of some systems.	
Realization monitoring	A part in relation to operators, and a part in relation to other participants and users.	
Risks	Security.	

Type of activity:	Project	
Name of activity:	Migration from 2G to 2,5 MK --- Evolution from 2G to 3G mobile communication systems	
Executor of activity:	Licensed operators of mobile communications in BIH	
Participants:	a) Institutes, professional associations, consulting companies, Faculty of Electrical Engineering and the Faculty of Traffic and Communications b) Service providers	
Description of activity:	The Project would supply the solution to a gradual and rational migration from second to the third generation of mobile communications. Namely, the path from 2G GSM system to the 3G UMTS system leads through the so-called 2.5G, or GPRS and EDGE system. Should both 2.5 generation systems be introduced, and to what extent? How to put to rational use the existing GSM infrastructure, to what extent and with what solutions should the fixed systems be integrated with the future mobile communication systems? These are the questions that need to be answered in an acceptable way.	
Expected results:	Above all, an reasoned solution to the dilemma of where to go next in the development of mobile communications. Because it is clear that we need to move on, with new technologies and solutions, and the question is which road to take.	
Components:	Component 1	Justifiability study for the introduction of new GPRS, EDGE and UMTS technologies to mobile communications.
	Component 2	Preparation of service providers to apply both technologies.
Prerequisites:	Decision by the operator to start the preparation procedure for the introduction of 2.5G and 3G of mobile communications.	
Execution deadline:	2004, 2005/2006	
Financial projection:	Circa 50.000 KM.	
Critical implementation factors Needs in capacities crucial to the use of individual applications and services.		
Source of funding	The costs of the project are entirely covered by licensed mobile communications operators.	
Labor market, human resources, necessary knowledge and skills	Evaluation of users in accordance to segments: GSM, GPRS, EDGE and UMTS.	
Development environment	Regulatory environment, promotion, possible use of the system for other projects, for example emergency service in the health care, etc.	
Technology	Technological solutions in the core and radio network, terminals. Application of the Internet to mobile terminals, education.	
Time specifics	Affects the development of other project, especially eHealth Care, emergency services, etc.	
Realization monitoring	Concept verification. Study review.	
Risks	None.	

Type of activity:	Project	
Name of activity:	Broadband access networks: xDSL, HFC, PLC, broadband access	
Executor of activity:	Three positioned TC operators in BIH, network operators, electrical power companies, cable operators.	
Participants:	a) Service providers b) Institutes, professional associations, consulting companies, Faculty of Electrical Engineering and the Faculty of Traffic and Communications	
Description of activity:	The Project would demonstrate the technical advantages, economic justifiability and the speed of introducing broadband access to users. Special aspect for individual groups of users: residential users, home offices, SMEs, big corporations.	
Expected results:	Adjusting solutions to suit individual users.	
Components:	Component 1	Division of individual operators and users in accordance with adjusted technology.
	Component 2	Conceptual solutions.
	Component 3	Project solutions.
Prerequisites:	Decision by the operator of the telecom, cable and electrical systems.	
Execution deadline:	2004, 2005/2006	
Financial projection:	Circa 150.000 KM.	
Critical implementation factors Review of real capacities of individual technological solutions and comparison of relevant costs.		
Source of funding	The costs of the project are entirely covered by licensed fixed communications operators.	
Labor market, human resources, necessary knowledge and skills	There is sufficient staff to realize the project.	
Development environment	Regulatory environment.	
Technology	Standards and technological solutions.	
Time specifics	Set percentage of broadband access in the fixed lines rates percentage.	
Realization monitoring	Concept verification. Study/project review.	
Risks	Regulatory failures.	

Type of activity:	Project/Pilot-project	
Name of activity:	Ethernet WAN – Pilot-project of the creation of MAN network with Ethernet access to the core network	
Executor of activity:	Three positioned TC operators in BIH.	
Participants:	a) Electrical Power Company, Railroad Company and new network operators b) Institutes, professional associations, consulting companies, Faculty of Electrical Engineering and the Faculty of Traffic and Communications	
Description of activity:	The Project would propose the solution for the construction of the backbone section of MAN network for the needs of a flexible service of providing MPLS based VPN networks, with simple and inexpensive WAN communication equipment at the user's location. The backbone portion of the network should be composed of minimum three balanced loops, connected by trunks with at least 100 Mbps capacity. The single mode optic fiber cable would be used as a medium to connect the loops. The project needs to include a sufficient number of power generators (at least one per each device of the network backbone), and a sufficient number of ports, or terminals on both ends of "last mile" connection (100 al least). As a possible solution for the connection between the equipment of the operator (PE) and the equipment of the user (CPE), include the VDSL technology.	
Expected results:	By the realization of the project, the following will be achieved: a quality and relatively inexpensive broadband solution will be provided for the creation of business user and government institutions networks, the transport capacities between the loops will be increased in order to use the possibilities of the broadband access technologies (above all the xDSL technology), and testing the data transfer services on the basis of MPLS VPNs for users and providers.	
Components:	Component 1	Technological solution project.
	Component 2	Pilot-project.
	Component 3	Testing.
Prerequisites:	Individual decisions by the positioned operators of the fixed network.	
Execution deadline:	2004, 2005/2006	
Financial projection:	Drawing up of the project 50.000, and up to 2 million KM for the realization of the pilot network.	
Critical implementation factors Testing equipment.		
Source of funding	The costs of the project will be entirely covered by positioned TC operators, each for its own network.	
Labor market, human resources, necessary knowledge and skills	There is sufficient staff to realize the project.	
Development environment	World experiences. Infrastructure.	
Technology	Technical infrastructure solution.	
Time specifics	Depending on other backbone solutions.	
Realization monitoring	Review of the project, solution testing..	
Risks	Sufficient number of users in the first implementation stage.	

Type of activity:	Project/Pilot-project	
Name of activity:	W LAN – Pilot-project of W LAN creation	
Executor of activity:	Three positioned TC operators in BIH, each for its own network.	
Participants:	a) New network operators b) Institutes, professional associations, consulting companies, Faculty of Electrical Engineering and the Faculty of Traffic and Communications	
Description of activity:	Analysis of basic standards of wireless local networks (Family of IEEE 802.11 Standards) and their possibilities. Review of characteristics of wireless networks and technologies used for the creation of W LANs. Comparison of wireless LAN technology with classic solutions, and of WLAN with other wireless technologies. Defining the type and configuration that will be experimentally built to serve for testing of basic types of services of such networks: Internet access, local news services and multimedia applications.	
Expected results:	Review of advantages of wireless communication in comparison to the fixed, in certain circumstances. Receiving data/elements for the choice of standards, or frequencies and technologies of the wireless LAN. Verification of scope and quality of service provided.	
Components:	Component 1	Project of the solution for the core network, transfer and access.
	Component 2	Choice of equipment to be used in the project.
	Component 3	Testing.
Prerequisites:	Decision by the operator to build the experimental pilot WLAN network.	
Execution deadline:	2004 and/or 2005	
Financial projection:	Drawing up of the project 50.000, and up to 500.000 KM for the realization of the experimental network, with testing.	
Critical implementation factors Choice of contractor.		
Source of funding	The costs of the project will be entirely covered by positioned TC operators, each for its own network.	
Labor market, human resources, necessary knowledge and skills	There is sufficient staff to realize the project.	
Development environment	Promotion and regulatory framework.	
Technology	Standards and technological solutions.	
Time specifics	Process parallel with broadband access in fixed network.	
Realization monitoring	Review of the project, testing.	
Risks	Sufficient number of users in the first implementation stage.	

Type of activity:	Project	
Name of activity:	Portal development	
Executor of activity:	Agency for information society	
Participants:	Institutes, professional associations, consulting companies, Faculty of Electrical Engineering and the Faculty of Traffic and Communications, three positioned TC operators in BIH, service providers, government institutions.	
Description of activity:	The project would suggest the solution to the creation of a "universal" portal for operators, providers and other major participants in providing ICT infrastructure for the needs of informatisation of the society in BIH. The needs of operators, providers and others would be analyzed to establish the common grounds and variations in demands. Also, the solutions and possibilities of equipment by various producers would be analyzed to suggest the core solution for the "universal" portal.	
Expected results:	Analyzed needs in relation to portals, operators, providers, and other, on one hand, and possibilities of producers, on the other. A standard design of the portal, with respect to differences in service providing, information and other among the future portal owners.	
Components:	Component 1	Conceptual design.
	Component 2	Development
Prerequisites:	Agreement of operators and provides through the Association for Communications and Informatics in the Foreign Trade Chamber of BIH.	
Execution deadline:	2004 and 2005	
Financial projection:	Circa 200.000 KM, provided by positioned TC operator and interested providers, based on parity.	
Critical implementation factors		
Source of funding	The costs of the project will be entirely covered by positioned TC operators and interested providers, based on parity.	
Labor market, human resources, necessary knowledge and skills	In principle, there is sufficient staff to realize the project, but some should receive additional training.	
Development environment	Promotion.	
Technology	Software.	
Time specifics	Not decisive.	
Realization monitoring	Verification of the conceptual design. Review of the project.	
Risks	Interest and technical and technological possibilities of users.	

12. MONITORING INFORMATION SOCIETY DEVELOPMENT (BENCHMARK PROCESS)

12.1. ACTION PLAN REALIZATION MONITORING

Realization of the Action Plan shall be monitored by the Agency or an institution with the authority in relation to the development and application of the ICT, at the state level.

Each year, the authorities (Agency management, related Ministry or a third body) shall be briefed through a status report.

In control years – 2005 and 2007 – the report shall contain the analysis, and a proposal of possible corrections to the Strategy.

12.2. ICT INFRASTRUCTURE DEVELOPMENT MONITORING IN BIH

The statistical monitoring system in BIH is still developing, which is why the collection of the relevant data/indicators on the ICT infrastructure cannot be provided, and the existence of certain statistical data/indicators on the ICT infrastructure development in BIH is questionable. The lack of reliable and timely statistical data/indicators presents an obstacle to planning and monitoring of the ICT infrastructure development (above all, in terms of the Internet access and the Internet use equipment).

In order to overcome the current state, we need to commence the creation of instruments for the purposes of statistical monitoring of the ICT infrastructure development in BIH, i.e. the collection of actual data. By filing periodic reports of all legal and natural persons that in accordance with their activities/daily practice belong to the ICT infrastructure (in accordance with the definition from Chapter 1 hereof), actual data would be collected, and their statistical processing would provide realistic indicators of the state of ICT infrastructure in BIH, and by comparison, we would get an insight into the competitiveness/comparability of BIH in this area in relation to the neighboring countries, and further away.

12.3. DETAILED INDICATOR SPECIFICATION

Indicator Definition:	Installed capacities
Indicator importance:	Availability of all installed capacities. This parameter is required to indicate the availability level in accordance with total market potential, and the total number of users, that in relation to the use percentage provides the profitability rating.
Source of data:	Reports of the operators and regulatory agency are the main source.
Additional indicators:	Digitalization degree, software version, commutation type, mobile technique, ATM IP MPLS and other technologies.
Data gathering:	The data is to be delivered to the Statistical Institute and the related ministries.
Frequency:	Twice a year. This is the dynamics of report preparation with the operator.
Related indicators:	Penetration of other indicators is directly related to the system use.
Indicator value factor:	Rated 4.
Indicator validity:	Rated 5.
Indicator availability:	Rated 5.

Indicator Definition:	Fixed user penetration
Indicator importance:	Provides the rating of the number of users per 100 inhabitants. The indicator most frequently used as the indicator of development of a telecommunication service.

Source of data:	Operators and the regulatory agency. Statistical data or evaluations on total population.
Additional indicators:	Types of services provided by the network – IN services. Number of broadband per 100 ordinary lines. ISDN, ADSL.
Data gathering:	The data is to be delivered to the Statistical Institute and the related ministries.
Frequency:	Twice a year via periodic reports on the realization of the plan and the reports on business activities.
Related indicators:	Indicators on capacities, and indicators on mobile and Internet network.
Indicator value factor:	Rated 5.
Indicator validity:	Rated 4.
Indicator availability:	Rated 5.

Indicator Definition:	Mobile user penetration
Indicator importance:	Provides the rating of the number of users per 100 inhabitants. The indicator most frequently used as the indicator of development of a telecommunication service. It is divided in accordance with the user type number: total, postpaid and prepaid.
Source of data:	Operators and the regulatory agency. Statistical data or evaluations on total population.
Additional indicators:	Types of networks: GSM, GPRS; EDGE, etc. Types of services: WAP, MMS, LBS, etc.
Data gathering:	The data is to be delivered to the Statistical Institute and the related ministries. Statistical data or evaluations on total population, as well as on total number of households.
Frequency:	Twice a year via periodic reports on the realization of the plan and the reports on business activities. Operators and the regulatory agency.
Related indicators:	Indicators on capacities, and indicators on fixed and Internet network.
Indicator value factor:	Rated 5.
Indicator validity:	Rated 5.
Indicator availability:	Rated 5.

Indicator Definition:	Internet user penetration
Indicator importance:	Provides the rating of the number of users per 100 inhabitants. The indicator most frequently used as the indicator of development of a telecommunication service.
Source of data:	Operators and the regulatory agency. Statistical data or evaluations on total population, and the total number of households.
Additional indicators:	It is divided in accordance with the number of users: great, small, dial-up, ISDN xDSL, etc.
Data gathering:	The data is to be delivered to the Statistical Institute and the related ministries.
Frequency:	Twice a year via periodic reports on the realization of the plan and the reports on business activities.
Related indicators:	Indicators on capacities, and indicators on fixed and mobile network.
Indicator value factor:	Rated 5.

Indicator validity:	Rated 5.
Indicator availability:	Rated 5.

Indicator Definition:	Cable TV user penetration
Indicator importance:	Provides the rating of the number of users per 100 inhabitants. The indicator most frequently used as the indicator of development of a telecommunication service.
Source of data:	Cable operators and the regulatory agency. Statistical data or evaluations on total population, and the number of households.
Additional indicators:	Number of channels, VoD services, possibilities of other services, the Internet etc.
Data gathering:	The data is to be delivered to the Statistical Institute and the related ministries. Statistical data or evaluations on total population, as well as on total number of households.
Frequency:	Twice a year via periodic reports on the realization of the plan and the reports on business activities. Operators and the regulatory agency.
Related indicators:	Indicators on capacities, and indicators on fixed and Internet network.
Indicator value factor:	Rated 5.
Indicator validity:	Rated 5.
Indicator availability:	Rated 5.

Indicator Definition:	Penetration of the number of computers used
Indicator importance:	Provides the rating of the number of users per 100 inhabitants or per 100 households. Especially important in relation to the country GDP.
Source of data:	Customs imports indicators. Data on the sale of computers. Statistical data or evaluations on total population, and the number of households.
Additional indicators:	Types and capacity of units.
Data gathering:	The data is to be delivered to the Statistical Institute and the related ministries. Statistical data or evaluations on total population, as well as on total number of households.
Frequency:	Twice a year via periodic reports on the realization of the plan and the reports on business activities. Salesmen and computer companies.
Related indicators:	Indicators on capacities, and the Internet network.
Indicator value factor:	Rated 5.
Indicator validity:	Rated 4.
Indicator availability:	Rated 3.

Indicator Definition:	TV users - subscribers penetration
Indicator importance:	Provides the rating of the number of users per 100 inhabitants. The indicator most frequently used as the indicator of development of a telecommunication service.
Source of data:	Media operators and the regulatory agency. Statistical data or evaluations on total population, and the number of households.
Additional indicators:	Number of channels, possibilities of other services, etc.
Data gathering:	The data is to be delivered to the Statistical Institute and the related ministries. Statistical data or evaluations on total population, as well as on total number of households.
Frequency:	Twice a year via periodic reports on the realization of the plan and the reports on business activities. Media and the regulatory agency.
Related indicators:	Indicators on capacities, and indicators on the cable TV network.
Indicator value factor:	Rated 5.
Indicator validity:	Rated 5.
Indicator availability:	Rated 4.

Indicator Definition:	Web user penetration
Indicator importance:	Provides the rating of the number of Web sites.
Source of data:	The Internet, service providers and operators.
Additional indicators:	The number of hosts, etc.
Data gathering:	The data is to be delivered to the Statistical Institute and the related ministries.
Frequency:	Twice a year via periodic reports on the realization of the plan and the reports on business activities. Operators and ISPs.
Related indicators:	Indicators on capacities, and indicators on the Internet network.
Indicator value factor:	Rated 4.
Indicator validity:	Rated 4.
Indicator availability:	Rated 5.

ICT Industry

13. ACTION PLAN

13.1. CONDITIONS FOR THE STRATEGY REALIZATION

Measures of the ICT industry development stimulation, that need to be taken by the state, as described in previous chapters, are common in market economy countries. Not one of the suggested measures assign the state with the role of an investor, neither does the state assume the role of planning concrete actions that should be taken by companies in the sense of their production programs. Such a role would indeed be inappropriate in a market economy. All the suggested measure are measures intended at the creation of a favorable business environment, that will be recognized by the investors, so that they would decide to invest in the target area, here the ICT industry.

The need for high intensity of certain measures comes from the fact that almost all companies that used to produce hardware, application software for economy and management, telecommunication equipment and related software, were destroyed during the war. The destruction was not only of physical nature; centers of competence were destroyed, highly specialized staff mostly emigrated, new knowledge was not gained during the decade of the most intensive technology boom in the 1990s, research and development groups disappeared form once great companies, the export competitive ability disappeared. In the course of infrastructure reconstruction (telecoms, electric power companies, railroads), former domestic producers from the ICT sector did not get the chance to participate in the reconstruction of the infrastructure that would enable them to initiate their own renewal. That is the result of the policy of the international community that did not even intend to reconstruct the non-privatized companies in the industry, and the fact that public procurements in the infrastructure sector were realized with no procedures and intentions to assist domestic companies also helped.

This way, Bosnia and Herzegovina was forced to the position in which almost all companies in the ICT industry have to make a fresh start, with completely new industrial structure, that cannot have high aspirations in the very beginning, especially not with no appropriate business environment.

All the proposed measures, and especially General Measures 2 and 4, and Specific Measures 1, 2, 3, 4, 6, and 8 must take place simultaneously and last for at least 5 years, with full intensity. After that, some of them may be reduced, after the establishment of the competitive ability of the ICT industry, at least at the regional level (at least 50% of total export activities in the region). The reduction of intensity is the natural course of the Special Measures 1.b, 1.c and 2 and 3.

13.2. SPECIFICATION OF ACTIVITIES/PROJECTS

The implementation of proposed activities at the state level (and partially, either directly or indirectly, at the entity and cantonal levels) needs to be one of the key tasks of the Agency for Information Society. Since the proposed projects and intiatives shall be implemented as soon as possible, the Agency should be established by the end of this year, at the latest.

13.2.1. GENERAL ACTIVITIES

A1.

Type of activity:	Initiative	
Name of activity:	Motivating Customs and Tax Measures	
Executor of activity:	Ministry of Finance of BIH/Entity Ministries of Finance	
Participants:	Council of Ministers of BIH and Entity Governments (adopting decisions in the initiative realization process)	
Description of activity:	Policy of motivating customs and tax measures is one of the crucial policies, with which real interest and intention of a country in development of an industry in shown. The goals of the ICT industry development clearly demonstrate the interests and needs for motivating measures crucial to the development. In that sense, it is necessary to urgently amend the regulation in relation to this area and introduce new, motivating measures.	
Expected results:	By strict adherence to the UN Convention, free the objects needed for science, education and culture purposes of the customs duties. Exempt of customs duties the imports of computers that are not produced by the local ICT industry, but in accordance with precise criteria. Exempt of customs duties investments of local entrepreneurs taken in the ICT industry sector, in the amount equal to that of international investors.	
Components:	Customs measures	Exempt of customs duty the repro material needed for the ICT production, but in accordance with precise criteria.
	Tax measures	Stimulate reinvesting in ICT industry by tax policy.
Prerequisites:	Performing analysis on the depth and justification of cutting customs and tax rates. Drawing up of precise criteria on which investments and products to exempt.	
Execution deadline:	Finish the implementation of this project/initiative by June 2005	
Financial projection:	Funds needed for the realization of the stated activities amount to 0 KM	
Critical implementation factors		
Source of funding	Budgets of BIH and Entities – regular activities entry.	
Labor market	There are human resources to realize the project.	
Development environment	Political will required. Promotion.	
Technology	Work technology adopted and confirmed in practice-	
Time specifics	Begin the preparation procedure to adopt the required decision immediately after the adoption of the Strategy by the Council of Ministers of BIH.	
Realization monitoring	Monitor the effects of proposed and adopted measures. Do it annually, directly via the customs records and/or indirectly via monitoring of the Internet users penetration increase.	
Risks	Decrease of the budget income. Insufficient quality of preparations and participation of the initiator of adopting required decisions.	

A2.

Type of activity:	Initiative	
Name of activity:	Motivating Early Local Supply and Demand Measures	
Executor of activity:	Ministry of Economy and International Trade Ministry of Finance of BIH	
Participants:	Council of Ministers of BIH (adopting decisions in the initiative realization process)	
Description of activity:	While respecting the competition and equal rights of the market participants, authorities and business associations, similar to authorities in other countries, need to provide market requirements and abilities that stimulate buying domestic products of the ICT industry.	
Expected results:	Enable by regulation: Acting as a sophisticated and honest buyer towards domestic companies (market) in public procurement; Developing regulatory mechanisms for the purposes of public procurement, exclusively from domestic companies; Developing regulatory mechanisms that through public procurement assist innovations and preparation of local ICT industry companies for competition with international companies; Considering companies domestic, provided that the company has other competency centers in the country, except the commercial and service ones (production, research and development, production and provider services).	
Components:	Component 1	Status review and analysis of the current market conditions.
	Component 2	Development of mechanisms for the preparation of local producers to compete with the international ones.
Prerequisites:	Awareness of the ICT industry participants in BIH and their sufficient understanding of the action.	
Execution deadline:	Finish the implementation of this project/initiative by June 2005	
Financial projection:	Funds needed for the realization of the stated activities amount to 50.000 KM	
Critical implementation factors		
Source of funding	Funds of businesses, producers in the ICT industry sub-sector.	
Labor market	There are human resources to realize the project.	
Development environment	Realize the project in accordance with previous experience.	
Technology		
Time specifics	Begin with the realization as soon as possible.	
Realization monitoring	Monitoring via the association of the producers of the ICT equipment and the Chamber of Commerce. Check points of status analysis, mechanisms concept and mechanisms application tests.	
Risks	Insufficient understanding of the activities by potential participants in realization.	

A3.

Type of activity:	Initiative/Action	
Name of activity:	Credit Insurance Agency (for ICT Industry stimulation credits)	
Executor of activity:	Ministry of Finance of BIH	
Participants:	Council of Ministers of BIH (adopting decisions in the initiative realization process)	
Description of activity:	Establish the Agency for Partial Credit Insurance for credit taken by domestic entrepreneurs with commercial banks, for the purpose of production in the ICT industry sector. (Mortgage collateral is not a solution for the ICT industry because this industry does not invest in real-estate in the initial development phases. Leasing is not a solution, either, because the amortization rates for equipment are rarely lower than 30% annually, so that leasing payments are insupportable).	
Expected results:	Credit Insurance Agency can solve the relations between the creditors and small and medium enterprises, of which there are plenty in the ICT industry.	
Components:	Component 1	Adopting appropriate decisions and creation of prerequisites.
	Component 2	Agency establishment. Start of operations.
Prerequisites:	Location, staff, initial funds.	
Execution deadline:	Finish the implementation of this project/initiative by end 2004	
Financial projection:	Initially 200.000 KM	
Critical implementation factors		
Source of funding	Special-purpose funds, Entity governments and Council of Ministers.	
Labor market	There is a labor market. Special staff training is unnecessary.	
Development environment	Adequate infrastructure required.	
Technology	Hardware and software equipment necessary for operations.	
Time specifics	Begin with the realization immediately after the adoption of the Strategy.	
Realization monitoring	Monitoring the turnover (placed, returned) at the annual level.	
Risks	Return of funds by the users.	

A4.

Type of activity:	Project
Name of activity:	Statistical Instruments of ICT Industry Monitoring
Executor of activity:	Institute of Statistics of Bosnia and Herzegovina
Participants:	Consumer Association. Chamber of Commerce.
Description of activity:	Lack of reliable and timely statistical indicators/data presents a serious obstacle to the planning and monitoring of the ICT industry development. In order to overcome the current state, it is necessary to initiate the creation of instruments for statistical monitoring of the ICT industry development in BIH, in accordance to SIBIS standards. By filing periodic reports of all legal/natural persons that, in accordance to their core activity/daily practice belong to the ICT industry (pursuant to the code book of production areas from Appendix X), actual data could be collected, and their statistical processing would provide realistic indicators of the state of the ICT industry in BIH, and by comparing them, we would have the insight into the competitiveness of BIH in this area, as compared to the countries in the region, and farther away.
Expected results:	Instruments of state and development of the ICT industry monitoring.
Prerequisites:	Determination and preparedness of the Institute of Statistics for the activity. Serious action in motivation of adequate legal and natural persons for participation in the activity.
Execution deadline:	Finish the implementation of this project by end 2004
Financial projection:	500.000 KM
Critical implementation factors	
Source of funding	Special-Purpose Funds, Entity Governments and Council of Ministers.
Labor market	There are human resources to realize the project.
Development environment	Realize the project in accordance with previous experience.
Technology	Hardware and software equipment needed at the Institute of Statistics of Bosnia and Herzegovina.
Time specifics	Begin with the realization almost immediately.
Realization monitoring	Develop in the Project.
Risks	Lack of coordination among the Institute of Statistics, Chamber of Commerce and others.

A5.

Type of activity:	Program/Project	
Name of activity:	e-Legislation	
Executor of activity:	Ministry of Communication and Transport and UNDP CO BiH	
Participants:	Ministry of Justice, Ministry of Economy and International Trade of Bosnia and Herzegovina, and State Court of Bosnia and Herzegovina.	
Description of activity:	Information Society is by definition integral, with no territorial and political divisions. Partial and sector approach is impossible, or senseless. Therefore, legal infrastructure needs to be set as a whole and as an open system, with not only fast progress of propulsive sectors, but also with free participation of areas that stay behind, in a unique structure. Society globalization is a logical consequence of its computerization. For that purpose, the influence of this process on the entire legal system needs to be systematically researched: from the administrative, over criminal and international civil law. For practical reasons, the priority task in this area must be e-business, which means adoption of regulation related to e-signature, e-contracts, e-accounts, e-banking, e-payment, other commercial documents, protection of customers in e-trade, protection of intellectual property etc. Harmonization of BIH policy and legislature with solutions of the EU must be the basic guideline for law and politics. This does not exclude the application of the USA legal solutions and the international soft law, where it can improve the entire legislature of the BIH Information Society.	
Expected results:	This project deals with the lack of legal environment enabled for the realization of entire potential of information and communication technology in the economic growth of BIH. This project provides the framework and support structure of the legislature amendments, legal experts training (including judges), and collection and disclosure of existing legal sources in the ICT sector. Direct project results include a number of new or revised acts, the e-Legislature Development Center program, databases related to legislature and experts in legislation and law, as well as a web service, that will disclose this information to a wider user circle.	
Components: (if it makes sense to describe them – this is optional)	Component 1	Legislative activity: review of existing and drafting new acts.
	Component 2	e-Legislature Center: direction towards the lack of technical expertise within legal community, at the level of Court Presidents, judges, court experts, and lawyers, companies and administrative units, etc., in support to good management in BIH.
	Component 3	Data Base (of legislature and legal professional) and web service.
Prerequisites:	Main prerequisites exist. UNDP has secured the funds.	
Execution deadline:	The implementation of this project has started. Finish expected by mid' 2005.	
Financial projection:	614.000 US$	
Critical implementation factors		
Source of funding	UNDP 50.000 US$/NORAD 564.000 US$	
Labor market	There are human resources to realize the project.	
Development environment	Realize the project in accordance with previous experience.	
Technology	Existing work technology, confirmed by practice.	
Time specifics	Special dynamics plan in project details.	
Realization monitoring	Establish a special monitoring body, and adopt documents through the usual legal procedure.	
Risks	Coordination/Project priorities/avoiding legal procedure and authorities.	

13.2.2. SPECIAL ACTIVITIES

A6.

Type of activity:	Project	
Name of activity:	Technology park in the area of ICT	
Executor of activity:	Agency of Information Society of BIH	
Participants:	University and Faculties and local authorities, ICT companies.	
Description of activity:	Plan in the Project the formation of Technology park (TP) at one of the Universities in BIH, at one of faculties of technical sciences. TP would be equipped with software and research and development staff, and introduction and adjusting of new technologies in the ICT sector. TP would be involved in generating new businesses, providing services such as measuring and testing, advising and connecting to Integral business and computer systems and the Internet, as well as renting special equipment and programs to small and medium enterprises to perform special analysis and operations.	
Expected results:	The result of TP work would be generating new products and businesses (using the synergy effects of research in various business areas), technical and technological advancements of hardware and software products, in the function of contribution to creating new jobs and increasing the number of employed young, educated, computer educated, TC and other staff members, necessary in the line of business. Special contribution of the TP can be expected in the area of entrepreneurship integration at the level of regional economic structure.	
Components:	Component 1	Drawing up the standard design.
	Component 2	Realization of the Pilot Project.
Prerequisites:	Resolution at the regional/local level	
Execution deadline:	Project in 2004. Realization of the Pilot Project in 2005.	
Financial projection:	The realization of the TP Pilot Project up to 3 million KM.	
Critical implementation factors		
Source of funding	Funding would be provided by the local administration (Canton) and Special-Purpose Funds.	
Labor market	There is a large number of companies, sufficiently young and educated people, who will, with the minimum material and financial requirements and the assistance of the experienced and motivated experts, be the executors of the work and development of the TP.	
Development environment	It makes sense to place the TP in towns (regions) with the population of 150.000 to 300.000, including the close environment, with good communication and a University close by.	
Technology	Development and research, and ICT and TC equipment.	
Time specifics	Critical time points can be related to the time of resolution and provision of funding.	
Realization monitoring	Plan in the project.	
Risks	Uncertainty with regard to the necessary number of users in the initial work period, acceptance of new businesses by the entrepreneurs and conditions of business operations of small and medium enterprises in, in general.	

A7.

Type of activity:	Project	
Name of activity:	Incubation center in the area of ICT	
Executor of activity:	Agency of Information Society of BIH	
Participants:	Foreign Investments Agency Local Administration and University	
Description of activity:	Standard design for the foundation of the Incubation Center (IC) at the local administration level – Municipality, or perhaps regional administration level – Canton. The Project should involve the formation of the IC (with a large number of small business units, not less than 20), preparation of the land and office space (real-estate) for business persons, specification of services that the IC will provide, such as: office space under favorable conditions, training and consulting services with low prices, professional advice with minimum price or for free, common conference rooms, utility services, etc. The Project also needs to consider the necessary actions to be taken in the preparation period, with regard to the establishment of IC (market estimate for new businesses, location identification, choice of the manager, business plans preparation, rules of behavior in the IC, etc.	
Expected results:	Useful and effective support to newly established ICT companies at the IC location can be expected in several first years of their operation, with cut costs and risk of initial failure. The support would, above all, be in the function of support the increase of the number of staff, but in case would it help and recover the weak.	
Components:	Component 1	Drawing up the standard design.
	Component 2	Realization of the Pilot Project.
Prerequisites:	Resolution at the regional/local level	
Execution deadline:	Project in 2004. Realization of the Pilot Project in 2005.	
Financial projection:	The realization of the TP Pilot Project up to 550.000 KM.	
Critical implementation factors		
Source of funding	Funding would be provided by the local administration and Special-Purpose Funds.	
Labor market	There is a large number of sufficiently young and educated people, who will, with the minimum material and financial requirements and the assistance of the experienced and motivated experts, be the executors of the work and development of the TP.	
Development environment	Appropriate infrastructure is necessary, as well as appropriate promotion and medial campaign.	
Technology	Development and research, and ICT and TC equipment.	
Time specifics	Critical time points can be related to the time of resolution and provision of funding.	
Realization monitoring	Plan in the project.	
Risks	Unfinished transition of property, insufficient support to development and research at all state level, lack of related regulation, etc.	

A8.

Type of activity:	Project/Pilot Project	
Name of activity:	"Telecom Cluster" of the ICT services	
Executor of activity:	Positioned operators of TC	
Participants:	Potential producers, recruited by the Association or Chamber of Commerce	
Description of activity:	Drawing up of the project of establishing the Cluster under the TC operators (e.g. BIH Telecom), with businesses from the total activities of the telecom, that are not included in the company core activities or have the function of support to the core activity of the telecom operator. The Project is to include the production of service provision software, especially innovative services in the fixed, mobile and data network, and also in the network of integrated services, the network of the future, solutions and creation of Call and Contact Center software, client relations, etc. The project should include the plan to establish companies, and provide favorable conditions for their operations, as for operations of other, existing companies with the same and similar business, in the area of the telecom interests.	
Expected results:	Employing young and qualified staff. Competition of local firms in providing solutions and software products. Preparation of local firms for international competition.	
Components:	Component 1	Drawing up the standard design.
	Component 2	Realization of the Pilot Project.
Prerequisites:	Resolution and an adequate decision of the Telecom Management	
Execution deadline:	Realization of the Pilot Project in 2005.	
Financial projection:	The realization of the Pilot Project up to 4 million KM. Potential co-financing partners are BIH telecom operators.	
Critical implementation factors		
Source of funding	Funding would be provided by the Telecom and perhaps an international fund.	
Labor market	There is a sufficient number of staff in Telecom (who cold be transferred to the Project in question, and it is possible that new staff will be recruited with the introduction of new technology). There are enough skilled and other human resources at the labor market who could be hired.	
Development environment	The government support at the highest level is necessary.	
Technology	Infrastructure, hardware and software, and communication equipment are necessary.	
Time specifics	There should be no critical time points.	
Realization monitoring	Plan in the project.	
Risks	The process of the TC services liberalization and telecom privatization, and establishing the mechanisms of universal services funding.	

A9.

Type of activity:	Project/Pilot Project	
Name of activity:	"Elektroprivreda Cluster" of the ICT services	
Executor of activity:	Electrical companies (EC) in BIH	
Participants:	Potential producers, recruited by the Association or Chamber of Commerce	
Description of activity:	Drawing up of the project of establishing the Cluster under the EC operators (e.g. Elektroprivreda BIH), with businesses from the total activities of the telecom, that are not included in the company core activities or have the function of support to the core activity of the EC. The Project is to include the production of electrical power production optimization software, software for recording and collecting of electrical power use bills, software and program for rational use of the electrical power, program of optimization and management of small power stations, etc. The project should include the plan to establish companies, and provide favorable conditions for their operations, as for operations of other, existing companies with the same and similar business, in the area of the EC interests.	
Expected results:	Employing young and qualified staff. Competition of local firms in providing solutions and software products. Preparation of local firms for international competition.	
Components:	Component 1	Drawing up the standard design.
	Component 2	Realization of the Pilot Project.
Prerequisites:	Resolution and an adequate decision of the EC Management	
Execution deadline:	Realization of the Pilot Project in 2005/2006.	
Financial projection:	The realization of the Pilot Project up to 2 million KM. Potential co-financing partners are EC operators.	
Critical implementation factors		
Source of funding	Funding would be provided by the EC and perhaps an international fund.	
Labor market	There is a sufficient number of staff in EC (who cold be transferred to the Project in question, and it is possible that new staff will be recruited with the introduction of new technology). There are enough skilled and other human resources at the labor market who could be hired.	
Development environment	The government support at the highest level is necessary.	
Technology	Infrastructure, hardware and software, and communication equipment are necessary.	
Time specifics	There should be no critical time points.	
Realization monitoring	Plan in the project.	
Risks	Successful restructuring of the electrical energy sector and the process of privatization of parts of the entire technological production chain – production and distribution of the electrical power.	

A10.

Type of activity:	Project/Pilot Project	
Name of activity:	Cluster production of ICT hardware	
Executor of activity:	Agency for Information Society	
Participants:	Chamber of International Trading of BIH	
Description of activity:	Preparation of project for the establishment of cluster production in the area of ICT hardware. The project needs to include the production in the area of electronics and microelectronics, IT and TC hardware, and assembling hardware structures and devices. The project also needs to include/plan both vertical (buyers, providers), and horizontal (users, technologies, channels) relations of internal network members and formally and informally interaction related cluster producers. In doing so, we need to have in mind our needs and possibilities of starting production: cables, cable TV components, measuring devices structures, PC supply units, control and measuring units for the processing industry, etc.	
Expected results:	Hiring young and skilled staff. Competition of local companies in finding solutions and production of hardware. Preparation of local companies for international competition. Generic role for businesses in other areas of economy.	
Components:	Component 1	Drawing up the standard design.
	Component 2	Realization of the Pilot Project.
Prerequisites:	Resolution at the regional/local level	
Execution deadline:	Realization of the Pilot Project in 2005/2006.	
Financial projection:	The realization of the TP Pilot Project up to 2 million KM.	
Critical implementation factors		
Source of funding	Funding would be provided by the Computerization Agency (funded by the EU and/or other sources) and private entrepreneurs.	
Labor market	There is a sufficient number of skilled and other staff who could be hired. This above all relates to major cities with universities and adequate professional schools.	
Development environment	The support of the government at the regional/local level is necessary.	
Technology	Treat in the project.	
Time specifics	Treat in the project.	
Realization monitoring	Plan in the project.	
Risks	Unfinished property transition, insufficient support to development and research at all levels of society, lack of related legislation, etc.	

A11.

Type of activity:	Project/Pilot Project
Name of activity:	Cluster production of ICT software
Executor of activity:	Agency for Information Society
Participants:	Chamber of International Trading of BIH

Description of activity:	Preparation of project for the establishment of cluster production in the area of ICT software. The project needs to include the software production in the area of customization, software development of content providers, games, Web applications, e-business and e-commerce applications, implementation of ICT products, software support to measurement processes, etc. The project also needs to include/plan both vertical (buyers, providers), and horizontal (users, technologies, channels) relations of internal network members and formally and informally interaction related cluster producers.	
Expected results:	Hiring young and skilled staff. Competition of local companies in finding solutions and production of software. Preparation of local companies for international competition. Generic role for businesses in other areas of economy. It should also be highlighted that BIH should become recognizable as a software producer in the following 5-6 years.	
Components:	Component 1	Drawing up the standard design.
	Component 2	Realization of the Pilot Project.
Prerequisites:	Resolution with regard to the directions of software production, at least in the coming period, some 2-3 years. This will probably be one of the tasks of the future Computerization Agency. Resolution of the local community.	
Execution deadline:	Realization of the Pilot Project in 2005/2006.	
Financial projection:	The realization of the TP Pilot Project up to 2 million KM.	
Critical implementation factors		
Source of funding	Funding would be provided by the Computerization Agency (funded by the EU and/or other sources) and private entrepreneurs.	
Labor market	There is a sufficient number of skilled and other staff who could be hired. This above all relates to major cities with universities and adequate professional schools.	
Development environment	The support of the government at the regional/local level is necessary.	
Technology	Treat in the project.	
Time specifics	Treat in the project.	
Realization monitoring	Plan in the project.	
Risks	Unfinished property transition, insufficient support to development and research at all levels of society, lack of related legislation, etc.	

In the period from 2005 to 2007, the established conditions and market relations should cause an investment boom in the said sector of economy.

So, it is estimated that it would take almost 15 million KM to realize the projects by 2005, and that, from 2005-2007, over 50 million KM should be invested.

14. MONITORING OF THE INFORMATION SOCIETY DEVELOPMENT (BENCHMARKING PROCESS)

14.1. MONITORING OF THE ACTION PLAN REALIZATION

Realization of the Action Plan will be monitored in the Agency or an institution in charge of the development and implementation of the information and communication technology at the state level, that will, in addition to other activities, take steps in possible widening of the software nomenclature.

Each year, a Status report will be submitted to the authority (Management of the Agency, the Ministry of that field, or some other authority).

In reference years – 2005, 2007 and 2010, the Report shall be enclosed with the Proposal of Necessary and Possible Amendments to the Strategy.

14.2. MONITORING OF THE ICT INDUSTRY DEVELOPMENT IN BIH

14.2.1. STATISTICAL MONITORING

Even though the statistical monitoring system of BIH is developing, it still does not provide for the compilation of relevant data/indicators on the ICT industry, or the existence of statistical data/indicators on the development of the ICT industry in BIH. The lack of reliable and timely statistical data/indicators, that are in accordance to SIBIS standards, presents a serious obstacle to the planning and monitoring of the ICT industry development.

In order to overcome the current state, it is necessary to begin with the creation of instruments of statistical monitoring of the ICT industry development in BIH, i.e. to collect the actual data. By filing periodic reports of all legal/natural persons that, in accordance to their core activity/daily practice belong to the ICT industry (pursuant to the code book of production areas from Appendix X), actual data could be collected, and their statistical processing would provide realistic indicators of the state of the ICT industry in BIH, and by comparing them, we would have the insight into the competitiveness of BIH in this area, as compared to the countries in the region, and farther away.

14.2.2. DATA/INDICATORS RELEVANT TO THE ICT INDUSTRY/BENCHMARKING INDICATORS

1. Basic Indicators

1.A Indicators that determine the readiness for ICT

- 1.A.1 Infrastructure (penetration)
- 1.A.2 Trade (exports and imports)
- 1.A.3 Qualifications (training)

1.B Indicators of the ICT use

- 1.B.1 ICT sector (share of the ICT industry in total economy)
- 1.B.2 Readiness of households and population for the use of ICT (penetration and use of ICT)
- 1.B.3 Readiness of legal persons for the use of ICT (penetration and use of ICT)
- 1.B.4 ICT patents

2. Additional indicators that are useful for monitoring of the ICT industry

2.1. Readiness of households and population for the use of ICT (the method of the ICT use and obstacles)

2.2. Readiness of legal persons for the use of ICT (the method of the ICT use and obstacles)

14.2.3. DETAILED SPECIFICATION OF BENCHMARKING INDICATORS

1.A.1 Infrastructure (penetration)

Definition of the indicators:	Infrastructure (penetration)
Importance of indicators:	Basic indicators: Number of main fixed telephone connections per 100 inhabitants Total number of subscribers per 100 inhabitants (natural and legal persons) Total number of subscribers/users of fixed telephony services (natural and legal persons) Total number of subscribers/users of mobile telephony services (natural and legal persons) Number of PC per 100 inhabitants Number of Internet users per 100 inhabitants (natural and legal persons) Total number of subscribers/users of Internet services (natural and legal persons) Monthly phone subscription fee for households Monthly mobile phone subscription fee Monthly phone subscription fee for legal persons Number of Internet hosts (at the international level available from Internet Software Consortium (ISC)) Other indicators: Number of Internet subscribers per 100 inhabitants (natural and legal persons) Number of web sites per 1000 inhabitants Number of web pages hosted in BIH Internet access costs
Source of data:	At the international level available from International Telecommunication Union (ITU) Regulatory Communications Agency Reviews/research of ISPs Reviews/research of telecom operators Statistical data or appraisal of total population
Collection of data:	Institute of Statistics and authorized Ministries
Frequency:	Twice a year, through reports on the business plan and activities realization
Related indicators:	Indicators from this area are mostly linked. This especially relates to capacities and networks. This indicator is related to ICT sector indicator.
Importance factor of indicators:	Rated 5
Validity of indicators:	Rated 4
Availability of indicators:	Rated 4

1.A.2 Trade (imports and exports)

Definition of the indicators:	Trade (imports and exports)

Importance of indicators:	Variables: ICT products exports and imports value Total exports and imports value Indicators: Trade balance of the ICT sector (ICT exports minus ICT imports divided by total trade balance of production (exports and imports average)) ICT exports increase ICT imports increase ICT exports as total exports % ICT imports as total imports %
Source of data:	Economic statistics Customs administration Other reviews in the business sector-
Collection of data:	Through the Chamber of International Commerce of BIH
Frequency:	Once or twice a year. Chamber reports.
Related indicators:	ICT infrastructure capacities. Level of computer education. Solvency of population. Government relief measures for equipment procurement.
Importance factor of indicators:	Technically, the ICT products and services exports is not an indicator of ability, but, for the purpose of clarity, it needs to be added to imports. Rated 5
Validity of indicators:	Rated 4
Availability of indicators:	Rated 4

1.A.3 Qualifications (training)

Definition of the indicators:	Qualifications (training)
Importance of indicators:	Indicators: Share of population with completed secondary education Share of population with completed tertiary education Ratio of primary, secondary and tertiary education Share of population with a degree in ICT field (as % of total number of university graduates and as % of appropriate age group)
Source of data:	National statistical data on education UNESCO
Collection of data:	Through the Institute of Statistics
Frequency:	Once a year. School year
Related indicators:	State of capacities and equipment in the Infrastructure Sector
Importance factor of indicators:	Rated 5
Validity of indicators:	Rated 4
Availability of indicators:	Rated 4

1.B.1 ICT Sector (share of ICT industry in total economy)

Definition of the indicators:	Use of ICT (share of ICT industry in total economy)
Importance of indicators:	Variables: Production value Added Value Employment Indicators: Share of added value in ICT sector in relation to total business sector added value ICT sector added vale increase Share of ICT sector employment in total business sector employment Increase of ICT sector employment Share of ICT sector production in total business sector production Increase of ICT sector production
Source of data:	Economy reviews Administration
Collection of data:	Through Chambers of Commerce and other professional association
Frequency:	Once or twice a year, through appropriate reports
Related indicators:	Within the indicator itself, there is even the relation of ICT production and services. There is a relation with total production and services, and entire business sector.
Importance factor of indicators:	Graded 5
Validity of indicators:	Graded 3
Availability of indicators:	Graded 4

1.B.2 Readiness of households and population for the use of ICT (penetration and use of ICT)

Definition of the indicators:	Readiness of households and population for the use of ICT (penetration and use of ICT)
Importance of indicators:	Indicators: Share of households owning a PC (% of total) Share of households with Internet access (% of total) Share of individuals (older than 16) who access the Internet from the following locations: - home - office - school - Internet café or similar - Other Share of individuals (older than 16) who use the Internet for the following activities: - e-mail/chat - searching for information on products and services - getting information from interactions with the government - searching for information on health - reading/receiving online news/information and magazines - playing/receiving games, music and software - using banking and other financial services - education - other
Source of data:	General reviews of population Specific ICT reviews Private sources
Collection of data:	Distribute the households in accordance to structure, individuals in sex, age, etc.
Frequency:	Annually
Related indicators:	Which indicators are in a way related to this indicator? What is the nature of the relation and why is it important?
Importance factor of indicators:	Rated 5
Validity of indicators:	Rated 3
Availability of indicators:	Rated 4

1.B.3 Readiness of legal persons for the use of ICT (penetration and use of ICT)

Definition of the indicators:	Readiness of legal persons for the use of ICT (penetration and use of ICT)
Importance of indicators:	Indicators: Share of legal persons owning a PC (% of total) Share of legal persons which use PCs (% of total) Share of legal persons that use the Internet (% of total) Share of legal persons that access the Internet in one of the following methods: - Analogous modem - ISDN - DSL - Mobile phone - Other Share of employees who use the Internet (% of total) Share of legal persons with a web site (% of total) Share of legal persons that receive orders via Internet (% of total) Value of orders received via Internet (% of total) Share of legal persons that send orders via Internet (% of total)
Source of data:	General reviews of population Specific ICT reviews Private sources
Collection of data:	Distribute the legal persons in accordance activities, size, etc.
Frequency:	Once or twice a year.
Related indicators:	Indicators on the infrastructure development, qualifications, etc
Importance factor of indicators:	Rated 5
Validity of indicators:	Rated 4
Availability of indicators:	Rated 4

1.B.4 ICT Patents

Definition of the indicators:	ICT patents
Importance of indicators:	Variables: Number of ICT patents Total number of patents Indicators: ICT patents as % of total patent number ICT patents as % of total number of ICT patents in the world Increase of ICT patents
Source of data:	Institute of Standards, Measurements and Intellectual Property EPO USPTO JPO
Collection of data:	In accordance with the international patent classification
Frequency:	Once a year. The number of patents.

Related indicators:	Education levels, level of production.
Importance factor of indicators:	Rated 5
Validity of indicators:	Rated 5
Availability of indicators:	Rated 5

2. Additional indicators useful for ICT industry monitoring

2.1. Readiness of natural persons and households for the use of ICT

Additional indicators:

- Share of households with no Internet access due to:
  - Too great costs
  - Lack of knowledge
  - Lack of interest
  - Language barrier
  - Other
- Share of households that access the Internet in one of the following methods:
  - Analogous modem
  - ISDN
  - DSL
  - Cable access
  - Mobile phone
  - Other
- Share of individuals (older than 16) who access the Internet with the following frequency:
  - At least once a day
  - At least once a week, but not daily
  - At least once a month, but not weekly
  - Less often than once a month
  - Do not know
- Share of individuals (older than 16) who access the Internet for one of the following reasons:
  - Paid work of job,
  - Education,
  - Volunteer or socially useful work
  - Personal or private
  - Other
- Value of orders made by individuals via the Internet (older than 16)

Classification: Additional classification

- Households classified by the income levels
- Profession of individuals

Sources:

- Same as for basic indicators.

2.2. Readiness of legal persons for the use of ICT

Additional indicators:

- Share of legal persons that do not use the ICT (computers) for one of the following reasons:
  - ICT costs too great
  - Level of ICT knowledge among employees too low
  - Difficulty in finding and hiring qualified ICT staff
  - Employees resist using the ICT
  - Advantaged of using ICT nor recognized
  - Other
- Share of legal persons with no Internet access due to:
  - Too great expenses
  - Too slow or unstable data transfer
  - Lack of qualified staff
  - Advantages of using the ICT not recognized
  - Lack of safety (viruses, hackers)
  - Other
- Share of legal persons that use the Internet for the following purposes:
  - Data searching
  - Market analysis (e.g. prices)
  - Communication with public institutions
  - Hiring and finding workers
  - Ordering products and services
  - Other
- Value of orders made via the Internet (% of total annual expenses)

Classification:

- Same as for basic indicators

Sources:

- Same as for basic indicators

APPENDIX: Description of activities and indicators - Templates

Each and every activity is defined as follows:

Type of activity:	Program/Project/Pilot project/Initiative/Activity/...	
Title of Activity:	Brief, recognizable and clear. Title of Activity	
Stakeholder:	Who should be the main stakeholder (institution, organization, company, ...)?	
Participants:	Who else is the important actor in implementation? In what capacity?	
Description of activities:	Brief description of activities. Explains the essential idea without giving detailed description of implementation.	
Expected outcome:	What will concrete results be?	
Components: (if it makes sense to describe them - optional)	Activity component 1	Brief description of component, including expected outcome.
	Activity component 2	Brief description of component, including expected outcome.
	...	...
Preconditions:	Are there any important preconditions that must be fulfilled in order for activities to be implemented?	
Execution period:	Expected implementation timeframe.	
Financial prognosis:	Rough estimate of investments and subsequent monthly/annual expenses.	
Critical implementation factors		
Funding sources	What are initial/continued funding sources?	
Labor market, human resources, necessary knowledge and skills	Is there a labor market pertaining to the specialized skills necessary for implementation of activities? If there is, what are its features, geographic distribution in the country, the region, what are the trends etc. If there is no appropriate labor market (non-existent or not at appropriate level), what should be done in that regard (some activities could be at meta-level, i.e. they could be directed at creating capacities for implementation of other activities). What national strategy is needed with regards to development of relevant human resources, including "brain drain" prevention strategy?	
Development environment	What development environment should be created to implement activities? Legislative and regulatory environment? Political environment? Infrastructure? Institutions, agencies, associations? Promotion?	
Technologies	What technologies require key investments? Hardware, software, communications? Are there some standards that should be immediately imposed? What products and services are important with regards to procurement or development?	
Time frame	Are there critical time lines, e.g. deadlines related to European integration processes, deadlines imposed "from outside", critical points in time related to implementation of linked policies from different fields etc.?	
Monitoring execution	Manner of monitoring implementation of the activity. Benchmarks.	
Risks	Predictable risks. Risk analysis. Corrective actions.	

System of indicators for monitoring the information society development is based on SIBIS system[3], and it is additionally upgraded and adjusted to BiH conditions. Each indicator is defined as follows:

Indicator definition:	Description of the indicator. Manner of calculation.
Importance of the indicator:	What does the indicator show? How should it be interpreted? Why is it important for monitoring the information society development?
Sources of information:	What are the sources of information on basis of which the indicator is calculated? In what form should the data be collected?
Data collection:	In what manner should the data be collected? What kind of research does it require? Is it possible and is there a need to institutionalize collection of certain data – if so, who is authorized for collection of such data?
Incidence:	How often does the indicator need to be calculated? Why?
Correlated indicators:	What indicators in some way correlate with this indicator? What is the nature of that correlation and why is it important?
Indicator Weight Factor:	To what extent is the indicator important for evaluation of situation in the field? This is a numeric value from 1 to 5, where 1 stands for "least important" and 5 stands for "most important".
Indicator validity:	Having in mind the realistic situation with regard to data collection, to what extent this indicator can be "trusted"? This is a numeric value from 1 to 5, where 1 stands for "least trusted" and 5 stands for "most trusted".
Indicator availability:	Having in mind the realistic situation with regard to data collection, what is the likelihood of having this indicator on time? This is a numeric value from 1 to 5, where 1 stands for "least likely" and 5 stands for "most likely".

[3] SIBIS - New eEurope Indicator Handbook, European Comission and Information Society Technologies, November 2003.