Republic of Serbia
Ministry of Science and
Environmental Protection

FOND ZA OTVORENO DRUŠTVO - SRBIJA
FUND FOR AN OPEN SOCIETY - SERBIA

Serbia and Montenegro

National Strategy for an Information Society in Serbia

Draft 1
Belgrade, September 2005

FOREWORD

Given the profound promises and pervasive impacts of ICT on national economies and global competition, Serbia needs to embed ICT into their overall development strategies. National Strategy for Information Society development is key pre-request for this having in mind that managing the benefits, risks, and impacts of ICT is a challenging task in view of the complexity and uncertainty of the interaction between ICT, economic growth, and poverty reduction.

Serbia's National Strategy for Information Society Development (NSISD) will serve several roles:

- Raise awareness, resources and commitment to action.
- Build coalitions for policy and institutional reforms.
- Clarify roles, build public-private partnerships, and facilitate participation by all stakeholders, including NGOs.
- Focus scarce resources on exploiting ICT for national priorities, help sequence, and phase complementary investments.
- Complement market forces, promote societal applications, enable bottom up efforts, and ensure shared learning and scaling up.
- Address the special needs and dynamics of promising segments of the ICT industry for export and economy-wide competitiveness.
- Re-orient the national innovation system to meet the substantial and cumulative technological learning requirements of ICT (as a general-purpose technology).
- Address coordination failures, exploit network effects, and secure complementary investments to use ICT as empowerment and service delivery infrastructure.

The process of creation of this strategic document is supported by UNDP and Fund for Open Society in Serbia through implementation of the Project for Formulation of the National Strategy on Information Technologies for Development.

The Strategy and the Action Plan have been prepared in accordance with the obligations Undertaken by the Republic Serbia:

- Declaration accepted by Member States of the Stability Pact for Southeastern
- June 2002;
- Agenda for Information Society Development for the countries of Southeast Europe adopted in Belgrade on 20th October 2002,
- Conclusions of the SEE Ministerial Conference on Information Society development signed in Thessaloniki on 1 July 2005
- Action Plan and Declaration of the World Summit on Information Society, Geneva, 2003;

In the process of preparation of the Strategy, the following EU documents and recommendations were used:

- The Council of Europe, Lisbon Summit in March 2000, established the basic building
- blocks of e-Europe, a concept that represents an obligation not only for EU Member
- States, but also for candidate states for EU membership;

- European Commission Action Plan, eEurope+2003, and
- European Commission Action Plan eEurope2005;
- Draft Action Plan of the European Commission, i-2010.Plan.

Absence of national strategy for Information Society Development could bring Serbia in a position to have donor-led, ad-hoc and fragmented investments in information systems, with consequent distortions in priorities, enclave activities, duplication in investments, and diffusion of efforts, unrealized or unsustainable benefits, poor demonstration effects and little chances for scaling up. National strategic plans for the application of ICTs to development have proliferated in recent years among less-developed and transitional countries. International organizations have been promoting the formulation of such strategies for a number of years as a way of focusing limited resources and capitalizing on potential synergies. More than 90 countries in the world have been through several “generations” of ICT strategies, even though these may vary widely in scope, depth and ambition.

This strategy will be successfully implemented only if there is the political will and awareness from top political level of importance and benefits of Information Society development as well as broad support necessary to achieve funding for implementation process. Objectives of this strategy can be significantly enhanced and accelerated through cross-border and international collaboration.

Beginning with the National Information Society Policy (NISP) of the Republic of Serbia through the process of preparing the Strategy for Information Society Development and the Action Plan, the urgency for rapprochement of the Republic of Serbia towards the Information Society is promoted, entailing national engagement of all key entities in the republic of Serbia.

TABLE OF CONTENT

List of abbreviations:

B2B – Business-to-Business
bSEE – Broadband South Eastern Europe Initiative
CA – Certifying Authority
CIO – Chief Information Officer
CMIS – Central Management Information Service
CoE – Council of Europe
EDI – Electronic Data Interchange
EIS – Environment Information System
EEA – European Environment Agency
EIONET – European Environment Information Observation Network
EMR – Electronic Medical Record
EU – European Union
ECTS – European Credits Transfer System
eSEE – Electronic South Eastern Europe Initiative of the Stability Pact for SEE
FHSO – University of Applied Sciences Southern Northwest Switzerland
GIS – Geographic Information System
GCIS – Government Centre for Information Society
GII – Global Information Infrastructure
GII/GIS – Global Information Infrastructure / Global Information Society
GCI – Government Center for Information Society
G2C – Government-to-Citizens
G2B – Government-to-Business
G2G – Government-to-Government
HIS (ZIS) – Health care Information System
ICT – Information and Communication Technology
ITU – International Telecommunication Union
IT – Information Technologies
IS – Information Society
ISDN – Integrated Services Digital Network
MDG – Millennium Development Goals
M&E – Monitoring and Evaluation
NSDI – National Spatial Data Infrastructure
NSIDS – National Strategy for Information Society Development
NII – National Information Infrastructure
NGO – Non-governmental Organisation
NISP – National Information Society Policy
ODR – On-line Dispute Resolution
PHR – Personal Health Record
PPP – Public-Private Partnership
RTS –The Serbian Broadcasting Corporation (Radio televizija Srbije)
R&D – Research and Development
SME – Small and Medium Enterprises
SEECP – South East Europe Cooperation Process
SD – Sustainable Development
SIBIS – Statistical Indicators Benchmarking the Information Society
SEIS – Serbian Environmental Information System
SAA – Stabilisation and Association Agreement
SOKOJ – Association of the Yugoslav composers

SAD – Single Administrative Document
ToR –Terms of Reference
TRIPS –Trade Related Aspects of Intellectual Property Rights
UNEP – The United Nations Environment Programme
UN/CEFACT – United Nations Center for Facilitation of Procedures and Practices for Administration, Commerce and Transport
UNLK – United Nations Layout Key
UNCITRAL – United Nation Commission on International Trade Law
VoIP – Voice over IP
WSIS – World Summit on Information Society
WSSD – World Summit on Sustainable Development
WTO – World Trade Organisation
XML – eXtensible Markup Language
VAT – Value Added Tax

1. INTRODUCTION

1.1. Why is a National Strategy for Information Society Needed?

Given the profound promises and pervasive impacts of information and communication technology (ICT) on national economies and global competition, Serbia needs to embed ICT into its overall development strategies, much as businesses have learned to integrate ICT into their core business strategies. Managing the benefits, risks, and impacts of ICT is a challenging task in view of the complexity and uncertainty of the interaction between ICT, economic growth, and poverty reduction.

Serbia's National Strategy for Information Society Development (NSISD) will serve several roles:

- Raise awareness, resources and commitment to action.
- Build coalitions for policy and institutional reforms.
- Clarify roles, build public-private partnerships, and facilitate participation by all stakeholders, including NGOs.
- Focus scarce resources on exploiting ICT for national priorities, help sequence, and phase complementary investments.
- Complement market forces, promote societal applications, enable bottom up efforts, and ensure shared learning and scaling up.
- Address the special needs and dynamics of promising segments of the ICT industry for export and economy-wide competitiveness.
- Re-orient the national innovation system to meet the substantial and cumulative technological learning requirements of ICT (as a general purpose technology).
- Address coordination failures, exploit network effects, and secure complementary investments to use ICT as an empowerment and service delivery infrastructure.

Raising Awareness. Serbia's NSISD aims at raising awareness, promoting national dialogue, generating consensus, and inspiring commitment to action. NSISD shall help mobilize public and private resources and rally the energies of all stakeholders. Through incentives and motivating vision, strategy can also signal local and foreign investors and civil society agents to participate in identifying options and realizing opportunities made possible by the ICT revolution. It shall harness such hopes and inspirations. It shall clarify the ICT options available for development, and those that should be taken. It shall set nationally owned priorities for donors and international organizations to support.

Building Coalition. Serbia's NSISD can be critical to building coalitions for reforms. Leaders in government and business may introduce reforms in many public policy spheres that hindered domestic ICT sector development, software exports, data communications, foreign direct investments, etc. A motivating vision will help overcome monopolies of telecommunications, bureaucratic inertia, and resistance to change. The threat of being left out of the loop, unable to participate in the knowledge-based global economy will help initiate overdue educational reforms. Providing success models and early demonstration effects -- through well-timed pilot projects that are conceived within national strategy -- could also alley fears and build a broader base for reform.

Clarifying roles and responsibilities. Serbia's NSISD shall help clarify roles and responsibilities and facilitate broad-based participation in the design and implementation of priority programs. It should not be viewed as a government-only strategy. In particular,

it shall define the role of government in setting the policy and institutional environment, in promoting ICT industry development, in targeting business segments or SMEs for ICT diffusion, and in supporting private and civil society initiatives. It shall clarify the roles of government, private sector, and civil society, and who leads when and where.

Focusing and Prioritizing. Serbia's NSISD process can help policy makers and other stakeholders focus, prioritize, sequence, and phase investments and complementary efforts. It shall stimulate partnerships for investments and complementary actions. This is particularly critical for e-government, strategic information systems, and other public sector applications that require major investments, institutional reforms, public-private partnerships, and long-term commitments. Similarly, choices will have to be made about the priorities for promoting access to information infrastructures for businesses, citizens, schools, government agencies, civil society, and the scientific community. Absence of national strategy in the past led to donor-led, ad-hoc and fragmented investments in information systems, with consequent distortions in priorities, enclave activities, duplication in investments, diffusion of efforts, unrealized or unsustainable benefits, poor demonstration effects and little chances for scaling up.

Mobilizing and Complementing Market Forces. Serbia's NSISD is needed to mobilize and complement market forces, promote societal applications, enable bottom up efforts, and ensure shared learning and scaling up. National planners face two fallacies: the complacent view that “the private sector will take care of it” and the false dichotomy that top-down macro-scale initiatives are doomed and only bottom up approaches can work for the poor. Evidence suggests that the private sector does not invest in rural communication and societal applications to optimal levels without significant support and partnership from the government, in subsidies, R&D, and other incentives. Countries with proactive programs and effective partnerships with the private sector and NGOs have been able to significantly reduce the digital divide as well as promote economy-wide competitiveness.

Scaling Up. Similarly, most pilots and bottom up efforts do not scale up without sustained support from national institutions with the requisite resources, scope, and scale. Bottom up efforts and pilot programs play an essential role in reducing uncertainties about the applicability of ICT to the problems of citizens, and contribute to the knowledge required to apply ICT most effectively to these problems. However, propagation of these efforts involves more than mere replication on a larger scale. While focused efforts and intensive support can make it easy to adapt ICT to local opportunities, application on a large scale require broad policy and institutional reforms and changes in management practices—all likely to encounter resistance and to require national commitment and knowledge about processes to diffuse and scale up best practices.

Leveraging ICT. The role of NSISD may be also clarified in terms of the three options for leveraging ICT: as an industry or sector in its own right, as a general purpose technology to be applied across sectors, and as an enabling infrastructure for empowerment and service delivery. The ICT industry, particularly the most promising segment, the software industry, is characterized by fast growth and technological change; low entry barriers; high global outsourcing; dominance of small enterprises particularly in developing countries; intensive producer-user interaction; importance of local user-base or domestic market; strong network or cluster effects; and high intensity of R&D. These features call for national strategies that focus attention and target

resources, stimulate the development of enabling polices and infrastructures, provide shared facilities for small software houses and incubators for innovative start ups, set standards and procurement practices to develop the domestic market, support export promotion programs to build country image and ICT brand, and provide incentives for foreign direct investment, finance, entrepreneurship and innovation. Governments also play an important role through outsourcing their ICT requirements through competitive bidding, and encouraging ICT use in the private sector.

Countries can no longer rely on selling generic skills, such as low cost labor, as a source of comparative advantage. The countries that have taken the lead in implementing national ICT strategy processes, and actively targeted segments of the ICT industry for systematic technological deepening, diffusion, and exports had the most outstanding economic performance. To reduce the risks and improve the impact of targeting the ICT industry for promotion and focused efforts, Serbia's government shall work with the private sector to identify target market opportunities, match specific niches to comparative advantage, systematically assess current constraints and jointly devise the policies and programs to develop the industry and exploit market niches.

What is the role of Serbia's NSISD in leveraging ICT as a general purpose technology? It shall target ICT as a core technological competency, in regard to its requirements and its potential as a tool for competitiveness. Technologies differ in their learning requirements. Targeting technologies with substantial potential and spillover effects is shown to have greater dynamic benefits on economies. ICT is distinguished by the need for substantial and cumulative technological learning to realize its potential. It involves, among others, localization and adaptation, linkages among suppliers and customers, joint learning and standard setting, innovation intensity, and co-investment in complementary institutional resources. Organizations go through several phases to leverage ICT—phases that ultimately lead to organizational and business transformations. NSISD will also address the learning requirements for governments to use this technology for managing the public sector. Unfortunately, Serbia's national innovation system is poorly equipped to deal with the technological learning requirements of this fast and pervasive technological revolution.

What is the role of a national strategy in leveraging ICT as a service delivery and empowerment infrastructure? Information and communications technologies are characterized by interdependencies and network externalities, and national ICT strategies should address coordination failures, help exploit scale and network effects, secure complementary investments in human capital, and create synergies among programs. Coordinated public decision making is necessary to effective public investment in common databases and networks and to set ICT policies and standards to promote government-wide information sharing and one-stop access to public information and services. As governments are typically the largest information providers and ICT users, coordinated actions reduce duplication in data collection and ICT investments and training by various agencies. They also focus resources on improving the relevance, quality, and use of information. Coordinated action led by Serbia's government can help institutions to access global public goods in this area, including standards and free source software.

The risks of unrealized benefits from ICT investments are particularly high in the context of poverty due to the mutually reinforcing causes of poverty and the need for complementary assets. The role of ICT in poverty reduction is through its catalytic and

leveraging effects on income opportunities, educational and health services, and welfare provision. ICT benefits can be realized mainly through a holistic approach. A pro-poor ICT agenda should be pursued in line with a pro-poor agenda in other sectors such as education, health, and rural development.

Reforming the National Innovation System. A special focus of Serbia's NSISD shall be to reform the national innovation system to promote the diffusion of ICT among SMEs. Industries and services in Serbia will be predominantly small and medium enterprises (SMEs). However ICT diffusion to SMEs is typically constrained by lack of common infrastructures, low awareness, and weak adoption capabilities, among others. These SMEs also suffer from isolation, low productivity and limited access to markets, finance and information. So, the paradox is that these enterprises have the least access to ICT, yet can benefit the most from ICT deployment and diffusion.

Experience from national ICT diffusion program suggests that such programs can be effective in accelerating the diffusion process and in linking SMEs to the national and global supply chains. Coordination among private sector users is necessary to set cooperative standards for doing business and thus to establish common networks, databases and value-added services. Similarly, Serbia's government shall work with private sector associations and NGOs to identify priority business segments for promoting ICT diffusion and for partnering to modernize public services.

1.2. The Evolving Concept of the Information Society

The growing importance of information and communication technologies (ICTs) in human societies is undoubtedly one of the defining features of our present–day world. ICTs have become incorporated into all levels of human organizational endeavors, and have had a large impact on the ways humans communicate. The most obvious recent example of an ICT innovation’s enormous transformative power has been the development of the Internet and World Wide Web (WWW) over the last decade.

The prominence of information in today’s society has led various scholars and leaders to claim that we now live in a new "Information Society," a society where information dominates new modes of social organization. This movement to a "new society" is by no means a claim without debate, however. The shift to an Information Society has been framed by some in the context of a "continuity vs. discontinuity". In other words, debate exists between the notion of an Information Society that is a fundamentally new form of social organization, or is one that is just a continuation of previous modes of social organization.

This distinction in thinking over the creation of an Information Society is not quite a simple one, however. A wide difference in thought exists within each camp, as different theorists place varying degrees of importance on information technologies and activities in shaping the modern world.

What strikes one in reading the literature on the information society is that so many writers operate with undeveloped definitions of their subject. They write about particular features of the information society, but are curiously vague about their operational criteria. Eager to make sense of changes in information, they rush to interpret these in terms of different forms of economic production, new forms of social interaction, innovative processes of production of whatever. As they do so, however, they often fail

to establish in what ways and why information is becoming more central today, so critical indeed that it is ushering in a new type of society. Just what is it about information that makes so many scholars think that it is at the core of the modern age?

We may distinguish five definitions of an information society, each of which presents criteria for identifying the new.

1. **Technological**. Breakthroughs in information processing, storage and transmission have led to the application of information technologies in all corners of society. This causes upheavals and changes in social realms, practices and structures.

2. **Economic**. Information has the critical tendency to change an economy into information or knowledge economy and create the so-called knowledge industries. Their contribution to economic growth of their countries grows rapidly, and this causes problems when new categories in the information-related economic sectors are constructed.

3. **Occupational.** The numbers and importance of information-related professions, information or knowledge workers, grow, while the number of professions dealing with agriculture and the manual labor force decline. The problems here result from deepening class divisions due to unequal information.

4. **Spatial.** The limitations caused by place and time lose their meaning together with the growth of networking, the so-called information highway and global communication networks.

5. **Cultural**. The impact of new media becomes more and more pronounced and important in everyday life, as culture is produced and consumed by the media. The problems created by it are related to new dimensions, or definitions of reality vs. virtual reality, simultaneity, simulations, etc.

These need not be mutually exclusive, though theorists emphasis one or other factors in presenting their particular scenarios. However, what these definitions share is the conviction that quantitative changes in information are bringing into being a qualitatively new sort of social system, the information society. In this way, each definition reasons in much the same way: there is more information nowadays, therefore we have an information society.

There is a sixth definition of an information society which is distinctive in so far as it main claim is not that there is more information today (there obviously is), but rather that the character of information is such as to have transformed how we live. The suggestion here is that *theoretical knowledge/information* is at the core of how we conduct ourselves these days. In this information society, though the term knowledge society may be preferred, for the obvious reason that it evokes much more than agglomerated bits of information, affairs are organized and arranged in such ways that theory is prioritized.
By theoretical knowledge is meant that which is abstract, generalisable and codified in media in one sort or another. It is abstract in that it is not of direct applicability to a given situation, generalisable as far as it has relevance beyond particular circumstances, and it is presented in such things as books, articles, television and educational courses. It can be argued that theoretical knowledge has come to play a key role in contemporary

society, in marked contrast to earlier epochs when practical and situated knowledge were predominant.

All these theories provide a context for the understanding of the information revolution happening in today's world.

1.3. The Development of Information Society

Whether or not we are truly living in a new Information Society, however, the fact remains that ICTs and information–related work figure prominently in societal transformations. In addition to the social theorists, world governments and international bodies, such as the European Union (EU) and the United Nations, have been involved in the debate over, and the development of, the "Information Society."

Europe

In 1994 and 1995, a large number of national public authorities in Europe issued policy statements and plans regarding the development of electronic communications in their societies. This applies, for instance, to the UK, France, the Netherlands, Sweden, Denmark, Norway and Finland. At a Trans-European level, the EU white paper on growth and competitiveness and the so-called Bangemann Report were issued in late 1993 and in the summer of 1994 respectively.

The European information society vision has been reinforced by a consideration of the actual initiatives, which fall into four categories: (1) information highways, (2) interconnected advanced networks, (3) general electronic services and (4) telematics applications. The Bangemann Action Plan (1994) suggested the following priorities for action plans: (1) promoting the use of information technologies, (2) providing basic trans-European services, (3) creating an appropriate regulatory environment, (4) developing training for new technologies, and (5) improving industrial and technological performance. In this plan, promoting the use of information and communication technologies was linked to fostering teleworking, public service uses of telematics applications, and the closer involvement of users in drafting and implementing technology policies. The Bangemann Action Plan (1994) has quite successfully established a first official framework for the European Union information society policy.

In 2000, the EU created development targets for member countries, called the "Lisbon Strategy," which includes goals and strategies aimed at "preparing the transition to a knowledge–based economy and society, by better policies for the information society and R&D". Building the "Information Society" for the EU is directly related to the availability and affordability of ICTs to individuals, organizations, and society as a whole. The main focus for the EU is on ICTs, and increasing infrastructure and connectivity to them. The EU has taken on the information society discussion as one of policies of infrastructural expansion and member states' unity or cohesion.

eEurope was launched in December 1999 to ensure that the EU fully benefits from the changes the Information Society is bringing. eEurope's key objectives are to bring every citizen, home and school, every business and administration, into the digital age and online. It plans to create a digitally literate Europe, supported by an entrepreneurial culture ready to finance and develop new ideas. eEurope also wants to ensure that the

whole process is socially inclusive, builds consumer trust and contributes to social cohesion.

This was followed in June 2000 by the eEurope 2002 Action Plan, agreed to by heads of State and Government in Feira, setting out a roadmap to achieve *e*Europe's targets. At the Seville Council (21 June 2002), heads of states endorsed the objectives of the commission's Action Plan for eEurope 2005 as "an important contribution to the [EU's] efforts towards a competitive, knowledge-based economy", and called upon "all institutions to ensure that it will be fully implemented by the end of 2005".

Until eEurope's aims are achieved the EU's priorities will stay focused on a sound legal framework for converged communications services and e-commerce, innovative and qualitative content for new interactive services, and creating a skilled population.

To achieve the above objectives the eEurope action plan has set out a set of key action lines:

- **Broadband:** providing fast access to the internet at cheap prices, mainly through telephone lines (DSL) or cable but also using wireless technologies (3G mobile phones, WI-FI) and even satellite to be guaranteed by a proper implementation of last batch of EU legislation.
- **Security**: making sure electronic networks are free from hackers and viruses and safe enough to build consumer confidence in electronic payments security concerns have to be balanced with potential intrusion in to citizen's right to privacy.
- **e-inclusion**: making sure the information society is accessible to the largest number of citizens, overcoming geographical and social differences.
- **e-government**: bringing public administrations closer to citizens and businesses by providing modern online public services by 2005 - mainly through high-speed internet connections (broadband).
- **e-learning**: adapting the EU's education and training systems to the knowledge economy and digital culture.
- **e-health**: providing user-friendly electronic health services and information for both patients and health professionals across Europe. The main issue under this action line is the implementation of an infrastructure to provide for medical care, disease prevention, and health education on-line.
- **e-business**: stimulating the growth of e-commerce (buying and selling online) and the inherent re-organisation of business processes to digital technologies. eEurope proposes to adopt e-commerce legislation and promote self-regulation, establish electronic marketplaces for public procurement and encourage SMEs to "Go Digital".

At the European Ministerial Conference held in Warsaw on 11-12 May 2000, Central and Eastern European Countries recognized the strategic goal set by the EU-15 in Lisbon. It was agreed to embrace the challenge set by the EU-15 with eEurope, and to launch an “eEurope-like Action Plan”, by and for the Candidate Countries, as a compliment to the EU political commitments, in order to try and broaden the base for achieving the ambitious above mentioned goal. In February 2001, the European Commission invited Cyprus, Malta and Turkey to join the other candidate countries in defining this common Action Plan.

Like eEurope, the eEurope+ Action Plan aims to accelerate reform and modernisation of the economies in the candidate countries, encourage capacity and institution building, improve overall competitiveness, and provide for actions, which address the specific situation of the Candidate Countries.

To facilitate comparison and exchange of information not only amongst the Candidate Countries but also with EU Member States, actions are clustered around the same three main objectives identified in eEurope and the same indicators selected by the EU-15 are adopted for monitoring and benchmarking of progress. However, the Candidate Countries recognise that, if the full benefits of the actions are to be achieved, a further acceleration in the effective implementation and functioning of the *acquis communautaire* in areas related to Information Society is required. This has resulted in the inclusion of an additional objective not previously found in eEurope that aims to assist in putting in place the fundamental building blocks of the Information Society. Furthermore, attainment of the eEurope+ objectives can be significantly enhanced and accelerated through cross-border and international collaboration.

1. Accelerate the putting in place of the basic building blocks for the Information Society

    - Accelerate the provision of affordable communication services for all.
    - Transpose and implement the acquis relevant to the Information Society.

2. A cheaper, faster, secure Internet

    - Cheaper and faster Internet access.
    - Faster Internet for researchers and students.
    - Secure networks and smart cards.

3. Investing in people and skills

    - European youth into the digital age.
    - Working in the knowledge-based economy.
    - Participation for all in the knowledge-based economy.

4. Stimulate the use of the Internet

    - Accelerating e-commerce.
    - Government online: electronic access to public services.
    - Health online.
    - European digital content for global networks.
    - Intelligent transport systems.
    - Environment on-line.

On June 1, 2005 the European Commission launched a five year strategy “i2010: European Information Society 2010” to foster growth and jobs in the information society and media industries. i2010 is a comprehensive strategy for modernising and deploying all EU policy instruments to encourage the development of the digital economy: regulatory instruments, research and partnerships with industry. The Commission will particularly promote high-speed and secure broadband networks offering rich and diverse content in Europe.

In its i2010 initiative, the Commission outlines three policy priorities:

- To create an open and competitive single market for information society and media services within the EU. To support technological convergence with "policy convergence", the Commission will propose: an efficient spectrum management policy in Europe (2005); a modernisation of the rules on audiovisual media services (end 2005); an updating of the regulatory framework for electronic communications (2006); a strategy for a secure information society (2006); and a comprehensive approach for effective and interoperable digital rights management (2006/2007).

- To increase EU investment in research on information and communication technologies (ICT) by 80%. Europe lags behind in ICT research, investing only €80 per head as compared to €350 in Japan and €400 in the US. i2010 identifies steps to put more into ICT research and get more out of it, e.g. by trans-European demonstrator projects to test out promising research results and by integrating small and medium sized enterprises better in EU research projects.

- To promote an inclusive European information society. To close the gap between the information society "haves and have nots", the Commission will propose: an Action Plan on e-Government for citizen-centred services (2006); three "quality of life" ICT flagship initiatives (technologies for an ageing society, intelligent vehicles that are smarter, safer and cleaner, and digital libraries making multimedia and multilingual European culture available to all (2007); and actions to overcome the geographic and social "digital divide", culminating in a European Initiative on e-Inclusion (2008).

i2010 is the first Commission initiative to be adopted under the EU's renewed Lisbon strategy. It focuses on the most promising sector of the EU economy: ICT account for 40% of Europe's productivity growth and for 25% of EU GDP growth. Member States are asked to define National Information Society Priorities in their National Reform Programmes in mid-October 2005 to contribute to the objectives of i2010.

South Eastern European region

In order to address the challenges of Information Society development, to tap all the potentials offered by modern IT and to increase the possibilities of integration in the current world market, South Eastern European countries are active on the regional level in initaitive dealing with IT introduction and development, that is within eSEE (Electronic South Easten Europe) Initiative.

The Stability Pact e-South Eastern Europe (eSEE) Initiative was launched at the WT II Meeting in Istanbul in October 2000. It was officially constituted in January 2001. Regional ownership was reinforced by Serbia and Montenegro taking over chairmanship from Sweden in March 2002 and by the establishment of a Secretariat based in the Sarajevo office of UNDP.

The aim of the eSEE Europe Initiative is to better integrate SEE countries into the global, knowledge-based economy by supporting the countries of the region in the development of the Information Society, including benchmarking, best practices and the transfer of

knowledge. The Initiative is to promote the creation of a proper institutional environment for building the Information Society for all, in line with EU policies. It also aims at the co-ordination and facilitation of the introduction of ICT projects in various fields among others business, governance and education.

On October 29, 2002, at the Telecommunications for Development Conference in Belgrade, SEE countries (Albania, Bosnia and Herzegovina, Croatia, FYR Macedonia, Moldova, Serbia and Montenegro) signed and accepted the international agreement, "eSEEurope Agenda for the Development of the Information Society" (eSEE Agenda), as a basic document for IT development activities in their region. This agreement is in line with eEurope 2002 and 2005 Action Plans and eEurope+ plan of candidate countries and represents the confirmation of SEE countries` commitment to develop information societies in their economies in accordance with European models and standards, and to associate themselves with European IT development process. This document was also endorsed by member countries at the March 2003 South East Europe Cooperation Process (SEECP) Summit.

As is defined in the eSEE Agenda, countries from southeast Europe will take concrete actions within the constraints of their specific environments in the fields of:

- Adoption of policy and strategy for the Information Society;
- Adoption and implementation of Legal Infrastructure for the Information Society accordingly to Acquis Communitaire settled within European Union countries;
- Establishment of regional cooperation and national implementation mechanisms; and
- Promotion of the Information Society for development.

The expected result for SEE countries of the eSEE Agenda for the Development of the Information Society is to get stronger political support first in their own countries, than in the EU and the rest of the world for ICT development actions in order to ensure their realization in practice.

On the Regional Ministerial Conference on the Information Society, held in Thessaloniki, Greece between 30th June and 1st July 2005 Southeast European countries took stock and reviewed the progress achieved so far under auspices of the Stability Pact eSEE Initiative and discussed continuation of the eSEE Agenda as a joint action plan for development of the Information Society in this region, and also as a prerequisite for more profound integration of SEE region in European technological and developmental currents. Recognising the complexity of some tasks included in the eSEE Agenda, SEE countries agreed on the Thessaloniki Ministerial Conference to modify their deadlines as follows:

OBLIGATION	NEW DEADLINE
Adoption of National Strategies for IS Development on the basis of the common guidelines prepared by the eSEE WG	December 2005
Cabinet or equivalent Level Bodies for the development of IS on the basis of the unified model ToR prepared by the eSEE WG	March 2006
Legal framework on e-Signature	March 2006
Legal framework on e-Commerce	March 2006
Law on Cyber- crime	June 2006
Law on Telecommunications	June 2006
Law on Personal Data Protection	June 2006

By recognising the need to align the eSEE Agenda with the new targets set out by the i2010 Initiative and the WSIS documents, and by taking into account regional and national circumstances and priorities, SEE countries also agreed that the eSEE Initiative Working Group shall prepare a proposal of the eSEE Agenda+ to be adopted at the next South Eastern Europe Ministerial Conference on the Information Society.

The Ministerial Conference held in Greece was also an opportunity for SEE countries, as well as Greece and Romania, to sign the Memorandum of Understanding on the Broadband for Southeast Europe (bSEE) Initiative. The main ideas behind this bSEE Initiative are the following: 1) the need to promote integral links in the Electronic Communications sector between the countries of the SE European region with a view to leverage capabilities and opportunities on both sides, 2) common interest in advancing the growth of investments, joint ventures, joint initiatives, technology development and markets in the Electronic Communications sector. The main aim of this new Initiative is to develop a unified broadband market fully interconnected to the European and global networks and to implement a technology and industry co-operation programme aimed at fostering business partnerships between countries of the South East Europe region.

The scope of co-operation between countries participating in the bSEE Initiative shall include the following areas relating to broadband:

- Setting statutory and regulatory objectives and frameworks with respect to European Union Directives and global standards;
- Aggregating demand leading to broadband development;
- Evaluating broadband technologies and international best practices;
- Developing skills through exchange programmes and through joint sponsorship of conferences, training programmes and seminars in the field of broadband technologies and services;
- Prompting planned activities regarding broadband investment that would result in building awareness, increasing level of public interest, and empowering SMEs to participate in such initiatives;
- Addressing market failures that are beyond the reach of policy tools;
- Providing incentives to the private sector for broadband development, especially in rural and remote areas;
- Monitoring progress and producing timely reports; and
- Formulation of agreed regional projects, which could be financed from European Union Funds or other available sources.

Other world governments and international bodies

From other parts of the world, the Clinton-Gore initiative on information superhighways and the creation of a national information infrastructure is very well known, as are the Japanese, the Singaporean and the South Korean plans. Furthermore, Canada and Australia have made their national plans, and so have some developing countries in Asia, e.g., Malaysia, Thailand and the Philippines. Additionally, a G7 meeting in Brussels addressed the question in February 1995 and a Global Information Infrastructure Commission has been set up on the basis of a private initiative. It is remarkable that so many countries and international institutions, at the same time, elaborated plans and programs for the exploitation of the potentials of the emerging information and communication technologies (ICTs).

In its landmark 1996 study “Knowledge Societies: Information Technology for Sustainable Development” the United Nations Commission on Science and Technology for Development recommended that developing countries formulate national ICT strategies. Since then, other international for a, including the DOT Force and UN-ICT Task Force, have re-emphasized this recommendation, and as a result a larger than ever group of developing countries were aware of the importance of national ICT strategies.

The United Nations, through UNESCO, has been involved in the Information Society concept for several decades, most notably with the MacBride Commission Report in 1980. The UNESCO–sponsored International Commission for the Study of Communication Problems, or MacBride Commission, published a report in 1980, entitled, "Many Voices, One World: Communication and society, today and tomorrow." The report covers various topics, censorship, concentration of media ownership, and freedom and responsibility of the press, to name a few. UNESCO, as the sponsoring agency, chose to highlight "communication" as a basic right, rather than focusing on "information."

National strategic plans for the application of ICTs to development have proliferated in recent years among less-developed and transitional countries. International organizations have been promoting the formulation of such strategies for a number of years as a way of focusing limited resources and capitalizing on potential synergies. The International Telecommunication Union (ITU) and United Nations Development Programme (UNDP) have specialized staffs to assist countries in developing these strategies. Both the G-8 DOT Force and its United Nations successor, the UN ICT Task Force, emphasized the value of comprehensive national strategies for the effective integration and application of ICTs to development agendas. One of the seven working groups of the DOT Force was focused on national strategies of ICT for development and the promotion of initiatives to generate such efforts. The UN ICT Task Force continued that emphasis in its Working Group 2, which is sponsoring with UNDP a series of regional gatherings for countries that have created national strategic plans or are in the process of doing so. McConnell International estimates that there are now more than 70 countries with the equivalent of national “e-strategies” or ICT for development plans. UNDP puts the figure at 90 and counting. Indeed, many countries have been through several “generations” of ICT strategies, even though these may vary widely in scope, depth and ambition—as well as in the degree to which they reflect the political will and broad support necessary to achieve funding and implementation.

Another attempt by the UN to highlight the importance of information and communication issues is found in the World Summit on the Information Society (WSIS). WSIS can be viewed as an expansion and continuity of the EU idea of the Information Society, as it is using this idea for the larger "world community," and is focusing on ICTs and infrastructural expansion. This Summit, co–sponsored by the UN, in conjunction with the ITU, is taking place in two phases. The first phase took place in Geneva in December 2003, and the second phase will take place in Tunis in November 2005. Among the stakeholder groups attending the Summit are members of government, the private sector, and civil society participants. The first phase of the Summit set forth a *Declaration of Principles* and a *Plan of Action* of the "Information Society," both standard documents of UN–sponsored conferences. WSIS is part of the ongoing Information Society debate, as it is structured on the UN summit model, a post–Cold War phenomenon first inaugurated in 1992 with the Earth Summit in Rio de Janeiro. The second phase of the Summit will take place in Tunisia in November 2005, where it is hoped progress on meeting their first phase goals and follow–up will take place. WSIS is the first UN summit that is taking place in two phases.

In the case of WSIS, the ITU has taken the lead in organizing the Summit, and has placed "information" over "communication" in having primary importance. WSIS can thus be seen as a movement away from an international community focus on "communication," to a focus on "information." In addition, WSIS is a much larger and more ambitious project, as it is the first major summit of its kind dealing solely with issues of information.

The ITU is currently the most inclusive international ICT governance forum, including country governments and private sector and civil society organizations in its membership. The ITU also has the widest range of ICT governance functions for an international organization, including regulation of satellite orbital positions and regulation of the radio frequency spectrum. In the theoretical framework of international regime theory, the ITU also has been the basis of the formation of a highly successful international telecommunications regime. This regime has helped create the "rules of the game" for telecommunications, as well as the mechanisms for collective decision-making and enforcement of rules. The ITU's move to sponsor WSIS can be seen as a chance for it to influence debate on a wider set of issues regarding ICTs and development. Transformation in the world, in terms of globalization and the growing awareness of an "information age," are challenging the ITU's regime, as the movement to a Global Information Infrastructure/Global Information Society (GII/GIS) regime is taking place. It appears that the ITU is using WSIS as part of an ongoing effort to define a new information regime, and to give it a new relevance in a rapidly globalizing and information intensive world.

In the case of the UN, its role is that of a facilitator in the creation of a "people–centered, inclusive and development–oriented Information Society" (Declaration of Principles, 2003). The theory behind the Summit is to make information technology work in furthering human and social development, as well as to achieve the UN's Millennium Goals. The UN and ITU, in sponsoring this Summit, are acknowledging that a new form of information society currently exists.

2. OBJECTIVES, GOALS AND TARGETS

2.1. Introduction

Information and communication technology (ICT) is, in many ways, a unique technology. It has the characteristics of a threshold technology, with the ability to rapidly change the whole structure of society and reshape the way our economy is organized.

When society is transformed from an industrial to an information-based economy, the problems of the industrial society will not vanish, since most parts of this society will still exist, even if in a different form. The information society will be layered on top of the industrial society in the same way that the industrial society is layered over the agricultural society.

The impact of ICT must be viewed in a very broad sense, from cultural changes caused by the use of new technologies, to the appearance of new possibilities for shaping a new economy in which production and consumption patterns look fundamentally different.

To complicate things further, the development of ICT will also create new economic, legal and cultural “meta challenges”. Not only must society learn to think in new ways when working with ICTs, but also existing actors, institutions and sectors will have to rearrange themselves. Some of these participants must abandon areas that they used to dominate, and others must expand their field of responsibility – and obviously new institutions and networks will need to be created during this process.

As the speed of change is fast, the need for flexible measures and the ability to allow new ideas the room to evolve will be very important. At the same time, a period of rapid change tends to frighten both people and institutions into defensive positions, in which it seems easiest to revert to well-known ways of thinking and well-known ways of work. This creates a challenging situation where the need for new thinking and for new ways of solving problems will be confronted with groups trying to protect what they control today, fearful of losing influence in a society with new ground rules and new goals.

2.2. Vision

A positive outcome for Serbia depends on decision made today. Before the end of the first decade of this millennium, we will be able to see whether ICT applications have come to be dominated by sustainability, or whether they are primarily driven by influential groups for their own short-term benefit.

Throughout history, the consequences of mankind’s actions have often been limited in time and space. The implications of many of our actions today are crucial, stretching far into the future. ICT has brought into focus the opportunity to develop new innovative tools to address these challenges and opportunities. Used in the right way, ICT could also support the development of a global ethic, giving us information about consequences of our action, helping us to act according to our values, and creating a new kind of transparency where our contribution to humanity becomes visible for the rest of the world to see. This could create a new standard that would address the needs of the physical world through the medium existing in the virtual world. Thus, by merging the digital with the physical, the visionary with the concrete, the ethical with the practical, the

long term with the short term, we could create a framework for Serbian Sustainable Knowledge Society.

Our Vision is that Serbia will take an active role:

- In an ecologically sustainable knowledge society, where information technologies are used to dematerialise our production and consumption in a way which leads to a significantly lower overall resource consumption by our society. Physical traffic will be largely replaced by virtual traffic, and printed documents by files. At the same time technological tools are designed in a way that their production and use will have a minimal impact on the environment, even though billions of devices will be in use. Information technology will also provide the means to monitor and evaluate the state and development of our natural environment.

- In a socially sustainable knowledge society, where there is equal access to information for everybody on our planet. The digital divide will be closed and all humans will have both the knowledge and the practical opportunity to use information technologies. This includes both receiving information from the web and the possibility to distribute their own work or opinion. Thus, the information technologies could be a major tool for the provision of a balance not only in the virtual but also in the real world.

- In an economically sustainable information society, where there is no waste of labor by unemployment, natural resources are used efficiently and the use of capital is organised so that information technology will be the key driver of an economic growth which is decoupled from resource consumption.

- In a culturally sustainable knowledge society, where all cultures are present in the virtual worlds in a balanced way. At the same time, the new media gives them the chance to enhance their cultural activities and to strengthen their identity also in reality. And the Internet serves to create a world-wide virtual community of common understanding and values.

2.3. What is the knowledge society?

"Knowledge society" is one term that has been introduced in attempts to characterise some of the main developments in industrial societies in the late twentieth and early twenty-first centuries. Some commentators dislike these terms for various reasons. They believe that the terms imply that current changes are revolutionary, whereas they should be thought of more as evolutionary trends. Some argue that, since all human societies have relied upon knowledge and information, the terms are implicitly discounting the capabilities of earlier societies and privileging the sorts of knowledge and information that our societies particularly prioritize. These criticisms have some force, but one might suggest that a useful way of thinking about knowledge society is that it involves the intersection of several related trends.

These are:

- The development of information societies based on the large-scale diffusion and utilisation of new information technologies (IT), which have allowed for unprecedented capabilities in 'capturing', processing, storing, and communicating data and information.

- More generally than just in the IT case, the increasing importance of innovation (especially technological, but also organisational) as an element in corporate and national competitiveness, and in strategies to increase the efficiency and effectiveness of organisations of all types.

- The development of service economies. The bulk of economic activity, employment and output is taking place in service sectors of the economy. 'Service' is an important management principle in organisations in all sectors, and specialised services (especially knowledge-intensive business services) provide critical inputs to organisations in all sectors on a vastly increased scale.

- The emergence of knowledge management as a specific issue, as organisations seek to apply formal techniques and new information systems to help them make more effective use of their data resources (e.g. data mining), information assets (e.g. enterprise resource systems) and expertise (e.g. human resource development, groupware and collaborative systems).

- Other important developments, related to the points above, include globalisation, changes in demographic structures and in cultural practices, and environmental affairs.

How does it relate to the information society?

The information society is one of the components of the knowledge society – not surprisingly, since information is one of the components of knowledge (sometimes defined as organised information, sometimes as the ability to utilize information effectively). The question arises as to what is distinctive about the present epoch. Just as human societies throughout history have accumulated and applied knowledge of various sorts, so they have also produced and processed a wide range of information. However, several arguments have suggested that it makes sense to think of the industrial world as moving into an information society – or a series of different information societies.

Just as industrial societies (or even welfare states) take various forms around the world, with very different political and cultural arrangements, so it is likely that there will be a wide range of information societies. However, globalisation does raise the possibility that diversity within national societies may become an issue alongside the question of how far national cultural identities need to be protected. IT permits global communication enabling subcultures and interest communities to form irrespective of national boundaries. The expansion of firms into global markets and the migration of labor (and students) adds further to the diffusion. Elements of different cultures are being transferred around the world on an unprecedented scale – though some elements are favored (e.g. global pop culture). Information societies may be internally heterogeneous and share many subcultures, as well as having many distinctive elements.

The knowledge society, then, depends upon the information society for its infrastructure. However, some information societies would be content simply to use new technologies to distribute entertainment products or even to engage in 1984-type political surveillance, rather than to apply them to create a generally better-informed populace, more active democracy and more creative business environment. An information society is a necessary but not sufficient condition for a knowledge society, which requires more than just the active implementation of new technologies.

NSISD would provide us with tools to make national readiness assessments and develop sectoral, regional and cities e- Strategies. The development of National Information Infrastructure and Strategic Information Systems and wide application of information and communications technology would inform and shape our modes of communication, and also the processes of our thinking and our creativity.

Serbia's sustainable knowledge society should be firmly based on a commitment to human rights and fundamental freedoms, including freedom of expression. It should also ensure the full realization of the right to education and of all cultural rights. In Serbia, access to the public domain of information and knowledge for educational and cultural purposes should be as broad as possible providing high quality, diversified and reliable information.

In Serbia's sustainable knowledge society, the production and dissemination of educational, scientific and cultural materials, the preservation of the digital heritage, the quality of teaching and learning should be regarded as crucial elements. Networks of specialists and of virtual interest groups should be developed, as they are key to efficient and effective exchanges and cooperation in knowledge societies.

In Serbia's sustainable knowledge society capabilities are developed to transform the way we relate to the international community and to our environment, providing significant societal benefits through improved human health and well-being, natural resources protection, environmental management and economic growth.

2.4 E-Readiness vs. Access and Usage

ICTs should lead to a widespread distribution of the means for information and communications access, management and productive use. It is widely accepted fact that ICT is only a tool and not an end for development. In other words, the number of telephone lines, personal computers, or even Internet hosts available in one country are not the ultimate indicators to be used to assess whether or not a strategy has been successful. On the other hand, while the economic and social value that people will derive from a greater use of ICTs is clearly a much better indicator of such success, it is also much more difficult to measure, monitor, and evaluate.

ICT as an universally accessible tool should go beyond discussions of the Digital Divide. It should include examining how, and under what conditions, ICT access can be made usable and useful i.e. how "effective use'' can be achieved by the range of marginal and excluded populations and communities. Developing strategies and applications for using ICT to support local economic development, social justice and political empowerment, to ensure local access to education and health services; to enable local control of information production and distribution; and to ensure the survival and continuing vitality of indigenous cultures is the necessary goal.

If it is clear that usage is a better indicator than access, it remains equally obvious that there will be no usage if there is no access. Moreover, both access and usage will depend heavily on the legal, regulatory, and other economic and social frameworks within which information and information technology can be accessed and used, and on whether government, business, schools, and individuals are interested and able to access and use them. Such elements are generally understood as being part of "e-readiness."

E-Readiness

Most business strategies begin with a review or assessment of the current state of business. They focus on key elements of the business – such as its customer base, its operations, and its product line – and describe where the business stands with regard to each of these areas, what it has achieved in the recent past, and highlights areas of relative strength, weakness, and opportunity. The assessment of how well (or badly) things are working now for a business drives the degree of change that will be required in the future.

A similar approach is required for the development of national information society development strategies. Understanding where the country stands with regard to key elements of its ICT development agenda must form the base from which a national strategy is developed. Unfortunately, in spite of the fact that E -readiness assessments have been conducted in over 137 countries, none have occured in Serbia. Therefore, it is of utmost urgency to organize Serbia's government offices for regularly performing E-readiness assessments.

E-readiness assessments are central to the ability to formulate e-strategies, in two key ways:

- *What to do*. E-readiness assessments provide the basic information from which to determine the themes or sectors on which to focus the country's strategy. They provide information on where a country has made good progress and help to identify areas of continuing weakness. Oftentimes this is done through comparison to other similar countries, so as to provide context in which to understand the country's current position.

- *How much of it to do*. E-readiness assessments also facilitate the process by which a country develops targets on how far to go in pursuit of each key objective (i.e. once it has been decided what to do, how much of it to do). They provide data regarding the current level of ICT development for a specified country, baseline data against which the progress of the strategy can be measured.

Depending on the specific context of a particular country, e-readiness may also give different emphasis to issues regarding, for instance, security and privacy, consumer protection, or 'digital divide' issues.

Access and Usage

Access (both physical and economic) is only one dimension of possible 'digital divides.' It is whether or not the connectivity and equipment provided (to businesses, local

governments, schools, hospitals, community access points, or individuals) will be actually used in a productive and sustainable fashion that will determine how ICTs actually contribute to local and international development objectives.

Beyond access and usage, it will also be important to assess the economic and social value that are derived from e-strategies. Because it has much more to do with 'outcomes' than with 'outputs,' and because it requires reference to pre-existing values in a society, this demands carefully designed projects and studies.

2.5. National Information Infrastructure

Revolutionary advances in information and communications technology have two concurrent and complementary impacts on developing countries. First, they open up extraordinary opportunities to accelerate social and economic development. Second, they create a pressing need for policy reform and investment to capitalize on the new opportunities and to avoid deterioration of international competitiveness.

Policy reform and investment are needed to move Serbia into a different kind of economy – the knowledge economy – in which information and knowledge are the key factors of production, trade and investment are global, and firms compete globally on the basis of knowledge, networking, and agility. This agenda also leads countries into a new type of society – the information society – that is quite different from an industrial society. An information society is better informed, more competitive, less stable, and more able to address individual needs; it can also be less centralized, more democratic, and friendlier to the environment.

Both the extraordinary development opportunities and the need for policy reform and investment are of direct concern to governments and to the private sector, including nongovernmental organizations. The private sector is the primary engine of the knowledge economy. Government has a fundamental role as a catalyst for change, as policymaker, and as guarantor of a level playing field. Public/private sector partnerships are therefore urgently needed in Serbia to develop a National Information Infrastructure (NII) strategy that exploits the link between information and socioeconomic development.

Because of its potential impact on the economy and society, NII is receiving attention worldwide, but its role is not the same in developed and developing countries. Three key differences are the primacy of infrastructure use over technology production, the importance of strategic information systems, and the need for direct, measurable impact on economic growth.

The term 'information system' denotes an information-based social capability, and as such it encompasses not just the technology – hardware and software – and the content, or data, but also the organization, incentives, procedures, and people involved. In high-income economies, certain basic capabilities such as the regular production of macroeconomic statistics are often taken for granted. Behind them, however, are complex arrangements of people, technology, organizations, and procedures that are often lacking in developing countries.

The term 'strategic information system' refers to a certain kind of system of central importance to economic activity. For example, a payment clearance and settlement system and a public financial management system are strategic necessities for sound

macroeconomic management and transaction efficiency in a growing economy. Such systems represent new forms of national infrastructure because, like roads or utilities, they have major economies of scale, require substantial sunk costs, are non-tradeable, and underpin other economic activities.

Which systems have this strategic importance is of course determined by each country. There is, however, a core group of strategic information systems that all countries must put in place for continued economic development. Included in this group are systems that:

- Facilitate general economic activity (national statistics and judicial administration systems);
- Enable the functioning of financial markets and the development of the private sector (property, land, and business registry systems; payment clearance and settlement systems; financial institution oversight systems);
- Improve delivery of infrastructure services (air transport control, vehicle registration, port operations, and utility management systems);
- Increase trade and global competitiveness (trade facilitation and custom administration systems);
- Manage the macroeconomy and government (planning and budgeting, debt management, civil service payroll, tax administration, and expenditure management systems at both national and local levels);
- Combat poverty (social security, basic education, and primary health care systems);
- Build human capital (school, university, and research networks; sectoral information systems for education and health); and
- Preserve the environment (natural resource inventory, geographic information, environmental monitoring, industrial/commercial licensing, and regional planning systems).

If the NII is conceived as consisting of both telecommunications networks and strategic information systems, it assumes extraordinary importance for developing economies. NII is a new instrument created through revolutionary advances in information technology that societies can now use for the development challenges they face.

If Serbia wants to accept the development challenges there is an urgent need to assess the current strategic information system projects in the country, their scope and importance, their budget and status, and the common constraints and difficulties they encounter. This will enable defining broad objectives and description of each system, order-of-magnitude investment costs, and financing strategy.

Serbia needs to develop understanding that information systems are social systems and what is generally called an 'information system' cannot meaningfully be restricted to computer or communications applications within an independently delineated social environment. Technical artifacts, such as hardware, software, data in paper or electronic form, carry with them engineers with the conventions of their trade; industries that sell, install, and support them; users who judge their significance and interpret the way they should be put into action according to their circumstances; consultants who claim that they can convert them from symbol manipulating machines to competitive advantage. Thus, information systems development should be understood to refer to ICT innovation and organisational change, whereby both the ICT items and the individual organisational

actors involved are part of institutionalized entities, that historically forme durable, but dynamic, heterogeneous networks.

2.6. Sectoral ICT Policy and Planning

Readiness assessment shall be a part of the initiative to develop sectoral ICT policies and planning. The purpose of the initiative is to: catalyze and facilitate the articulation of sectoral e-strategies, together with their associated planning and monitoring processes. A regional focus is encouraged while maintaining national sharing; Sectoral peer networks are nurtured on a regional basis; The sharing of programme information and resources amongst national, local and other development and funding agencies is encouraged.

Guidelines for Sectoral ICT Policy and Planning

Templates should be designed to assist policy makers, planners, and other stakeholders in developing sectoral e-strategies for the Serbian economy. They should provide structure to planning deliberations so that attention is focused on the key issues that must be addressed when developing e-strategies for a particular sector.

Sectoral e-strategic planning is predicated on a well-articulated national ICT vision and strategy. Such a national strategy provides the focal point for integrated cross-sectoral planning.

Using the templates

It is envisaged that the templates should be used as a consultative document in a formally constituted workshop or planning session. Typically, a group with specific authority to develop e-strategies for a particular sector, would convene a meeting of key stakeholders in the sector. Working with experienced facilitators over a two-three day period, the planning group should be able to develop a preliminary draft of a strategy for the sector. This would then be distributed to a broader cross-section of people for additional input and critique. After assessing the value of the additional inputs the document would be modified and finalized.

How the templates would be organized

Each of the templates should contain an introduction and identification of key stakeholders in the sector under study. Involving the key stakeholders is essential to the successful design and execution of the strategy. Without significant buy-in from the stakeholders no strategy can be successful. Stakeholders are more likely to support a strategy if they played a role in its development. For the various stakeholders to provide productive input to the planning process they must be fully engaged from the outset and be assigned appropriate responsibilities that will require their commitment.

The introduction would be followed by seven sections: key issues, strategic opportunities, challenges and threats, addressing challenges, cross-sectoral links, critical success factors, measures of success.

Each of the sections is described below.

1. Key strategic issues

This section would focus on the key strategic issues that must be addressed when developing e-strategies for the sector. Some examples of issues would be provided in the templates. While some issues have universal application others may reflect local contextual factors. It is extremely important and essential for planners to pay special attention to the contextual factors affecting the local environment. Building a strategic plan based on generic issues alone will be disastrous. Participants in the planning process must be pushed to identify issues that are significant in the local context, even if those issues have broader international implications.

2. Strategic opportunities

The deployment and use of ICT provide a variety of opportunities for economic growth and development. ICTs can change the structure of economic and physical relationships and provide economic players with new ways of interacting and doing business. In developing sectoral e-strategies planners should identify the strategic opportunities afforded by ICT that are particularly relevant to local setting. Every opportunity cannot be pursued. Planners must be careful that focus is given to those that fit key resource endowments (physical, intellectual, etc.) and build on strengths

3. Challenges and Threats

Every opportunity presents its own set of challenges and potential threats. Policy makers and planners must identify what these challenges are so that they can be specifically addressed. As with the opportunities, challenges, whether internal or external, must be addressed from the perspective of the local context. A generic view of the challenges will not provide a suitable platform for addressing them.

4. Addressing challenges

Experience from the literature suggest several cross-cutting themes along which the challenges faced to adopting and diffusing ICTs can be addressed. These are:

* ***Legal and regulatory infrastructure.*** Successful adoption and discussion of ICTs is significantly dependent on having a legal and regulatory environment and framework that promote, rather than hinder, the development of ICTs. Countries need to amend or develop new laws affecting the acquisition of ICTs as well as the result of their use. These may include laws and regulations governing the structure and operation of the ICT sector, privacy, security, and authentication, taxes, custom duties, and others.

* ***Technical infrastructure.*** Deriving benefit from ICTs is impossible without the appropriate technical infrastructure to provide the platform for the delivery of applications and services and the access to them. Each sector is affected in its own particular way by technical infrastructure issues.

* ***Human capital infrastructure.*** The availability of sufficient competent people to design, implement, manage, and use ICT applications and services is most critical to applying ICTs for economic and social development. ICTs, by its nature put greater emphasis on application of intellectual knowledge rather than

physical qualities. Countries therefore must focus efforts on developing and retaining a well-educated and competent population.

* ***Social, Cultural and other issues.*** A myriad of social, cultural, religious and other factors positively or negatively affect the adoption and diffusion of ICTs. For instance, higher income families are several times more likely to access ICTs than poor families. These issues must be addressed if the larger society is to benefit from ICTs.

5. Cross-sectoral linkages

Sectors do not operate in isolation but are connected to each other in a variety of ways. In developing e-strategies great attention must be paid to the current and potential linkages between different sectors of the economy. For instance, the links between education and health, agriculture and tourism, tourism and health, and others. In focusing on cross-sectoral issues, planners may be able to forestall potential problems while discovering new opportunities for applications and service delivery.

6. Critical success factors

The identification of a few critical success (or failure) factors to guide successful adoption of ICTs is essential to the strategic planning process. These are particularly important for focusing the attention of the political and administrative executives responsible for overseeing the implementation of ICT policies and strategies at national and sectoral levels.

7. Measures for success

Identifying measures for determining whether strategies developed are being implemented successfully and whether they are achieving the intended objectives is crucial to planning. By assessing the implementation and effectiveness of ICT applications and services, planners and other stakeholders will be able to understand what is successful and should be supported further and what is failing and should be adjusted or scrapped entirely. The limited resources with which most countries are endowed make this step imperative.

Integration into Overall Country Development Strategy

A national ICT strategy must be integrated into the overall development strategy of the country. It should assess the prospects and options for promoting the ICT industry, for using ICT in key sectors of the economy, and for empowering and networking all stakeholders in development. It should also systematically address how to use ICT as an enabling tool, in combination with other instruments, to address the two overarching goals of development: sustainable growth and poverty reduction.

2.7. Public Administration Reform Strategy

Serbia has adopted a Public Administration Reform Strategy. To perform reforms is formidable endeavor. A lot of energy and commitment is needed to revitalize public administration and thereby to enable it to play its critical and central role in providing

fundamental guarantees, such as ensuring peace and security, the rule of law and the protection of individual life and property.

ICTs are recognized as powerful tools that may help in envisaged reforms. But, deeper understanding of the role of public administration in a digital economy is needed to harness the potential of ICT for Serbian administration reform. Below are some concepts that may emerge as benchmarks in revitalizing public administration:

- Redefining and reaffirming the fundamental missions of the State, including its role in ensuring peace, security and stability and the rule of law and order, as well as creating a sustainable environment conducive to individual and private sector initiative and economic growth and human development;
- Developing and sustaining partnerships and collaboration among the institutions of the public sector, civil society and the private sector;
- Promoting cooperation among institutions of the State and public administration in different countries in order to facilitate the exchange of successful experiences in renewing public administration;
- Selectively integrating principles and practices of public management and governance in public administration so as to build and promote public administration systems that are efficient, economic and effective as well as participative, responsive, equitable and accountable to the public;
- Instilling, within the sphere of public administration, structures and a culture of research, including the application of new information and communication technologies which can play a critical role in giving new life to public administration;
- Encouraging the attraction, recruitment and retention of the best human resources in the public sector.

The role of the public sector in advancing the knowledge society

The knowledge society and the role of the public sector in its development is a critical area of study. The idea of knowledge development as an important element of governance is certainly not new. However, knowledge has assumed an even greater degree of relevance as well as a different shape with the advent and deepening of the knowledge economy and society.

Using the United Nations Millennium Declaration as a framework for the knowledge society, Serbia must seek to determine those knowledge-related activities and policy decisions that add public value and result in the meaningful utilization of knowledge throughout the whole of society. However, these general goals and recommendations must be translated into more concise, though flexible, conceptual frameworks, implementable policy and concrete actions. How this is to be accomplished remains somewhat vague, and most certainly complex. There is thus a need to further clarify and make more tangible the concepts and practicalities of the knowledge society. The public sector is critical to this effort.

Role of human resources in revitalizing public administration

People are the lifeblood of any organization and the agents of reform and renewal in public administration. The knowledge, skills, values and attitudes of public servants are at the heart of State performance. The revitalization of public administration, however,

must be seen from a holistic perspective. For example, the training of individuals cannot be isolated from the performance expectations of a specific function or position. Performance and human resources development plans for staff cannot be separated from the goals and service objectives of the employing organization, and goals and organizational structure cannot be disconnected from an understanding of the policy framework, including demand for services from the respective citizens. At the same time, the goals, priorities and performance objectives of an organization cannot be determined outside the broader national and government policy agenda and macro-socio-economic framework.

2.8. Sustainable Development Strategy

According to the organizers of the World Summit on the Information Society (WSIS), "We are in the midst of a revolution, perhaps the greatest that humanity has ever experienced. To benefit the world community, the successful and continued growth of this new dynamic requires global discussion and harmonization in appropriate areas." Unfortunately, few discussions in Serbia have focused on harmonizing the visions of the emerging information society with the principles and priorities articulated by the United Nations' Millennium Development Goals (MDGs) and the World Summit on Sustainable Development (WSSD).

Meaningful discussions about national policy coherence between these processes have been limited by restricted thinking about the information society and sustainable development. Each has emerged from a different community with a different vocabulary and process for determining national priorities. Information society specialists within national governments have primarily been drawn from the fields of telecommunications and economic development. Meanwhile, sustainable development has been delegated primarily to environment ministries despite the best efforts of its practitioners to articulate a holistic vision of integrated economic, social and environmental decision-making.

The lack of interaction between these two policy communities is currently serving to reinforce stereotypes of both fields. Sustainable development is seen as pertaining primarily to environmental issues and grassroots social development, while the information society is perceived as being more relevant to the economic development potential of urban elites. These stereotypes miss the reality that sustainable development and the information society are operationally interconnected. Both terms are increasingly used by civil society and academics to refer to a desired global future that is casting its shadow upon our current time and decisions. For sustainable development to be effective and efficient, it must harness the institutions and tools of the information society. And for the information society to sustain itself, it must pay careful attention to the stocks and flows of resources (material and human) and energy that underpin it.

The two phases of the World Summit on the Information Society provided an excellent opportunity to integrate sustainable development principles and practices into the institutions and policy frameworks that are shaping the information society. Serbia is now in the position to develop a Sustainable Development Strategy properly envisaging the role of ICT.

Here we propose six analytical frameworks within which the work should be organized. These frameworks are environmental information systems; eco-efficiency and

innovation; negative environmental aspects of the information society; modifying consumer demand and values; access to information and public participation; and poverty reduction.

The first and the most important framework, environmental information systems, is discussed in the following section.

Environmental information systems

Much of the early research on linkages between sustainable development and the information society focused on the potential for information systems to assist decision-makers to monitor and evaluate the state of the environment. Environmental information system (EIS) programs seek "to increase the quality, efficiency and accountability of decision-making processes through applications that systematically use environmental information. In this regard EIS development seeks to enhance the use of harmonized environmental data sets through improving data availability; facilitating access to data; ensuring that data is internally consistent; and ensuring that different data sets match each other." When the aspect of decision support dominates, some authors speak of Environmental Decision Support Systems or even Sustainable Development Decision Support Systems.

The process of generating and utilizing environmental information in decision-making is complex. Environmental information policy includes the elements of information generation, dissemination and stewardship. Generation covers issues such as legitimization, sources of data, classification schemes, mapping, quality and format. Dissemination determines the degree to which information is shared actively or passively among stakeholders, as well as additional issues such as privacy, confidentiality, secrecy and information pricing. Information stewardship policies regulate the ownership, sharing, currency and archiving of environmental information. While many policies only govern publicly generated data, some countries are also beginning to establish policies regarding corporate information that is increasingly required under environmental reporting regulations.

In 1992, at the Rio Summit, global policy-makers recognized the importance of information to decision-making in Chapter 40 of Agenda 21.8 The chapter recognizes that, "[i]n sustainable development, everyone is a user and provider of information considered in the broad sense. That includes data, information, appropriately packaged experience and knowledge. The need for information arises at all levels, from that of senior decision-makers at the national and international levels to the grass-roots and individual levels." Recommended activities included bridging the data gap and improving the availability of information for decision-making.

Building upon experiences in Europe and North America, EIS policies, programs and technologies have since been introduced around the world. Geographic Information Systems (GIS) applications (Box below) are one example of an EIS technology being transferred for adoption in other parts of the world. The United Nations Environment Programme (UNEP) has played a key role in this process, particularly in the fields of geo-spatial data modeling and the creation of environmental meta-data standards.

GIS as an environmental planning and management tool

Geographic Information Systems (GIS) have advanced into an increasingly important information tool, especially in the areas of environmental planning and management. By definition, GIS is a particular system of computer software and hardware capable of manipulating, analyzing and presenting spatial information. With this technology, skilled GIS technicians can map, query and analyze large quantities of data held together in a single database. As a result, GIS is used in many countries for a variety of purposes including: environmental resource analysis; land-use planning; locational analysis; tax appraisal; utility and infrastructure planning; demographic analysis; and habitat studies.

As environmental information systems have advanced, some have evolved to approximate sustainable development information systems including environmental, social and economic data for holistic decision-making.

Serbia may make sustainability gains by developing Serbian Environmental Information System (SEIS) and National Spatial Data Infrastructure.

One of the biggest challenges facing the Candidate Countries is the implementation of EU legislation and compliance with those laws governing the environment. The sheer scale of past environmental liabilities and the gap at the level of environmental protection in the Candidate Countries compared to the situation in the EU will require targeted long-term strategies. On the other hand, Candidate Countries also possess vast areas of untouched nature, which contribute considerably to biological diversity in the whole of Europe.

To keep these assets and at the same time develop and manage an economically and environmentally sustainable framework, Candidate Countries need to develop effective collaboration on specific issues with the EU.

Candidate Countries and the EU are currently ratifying agreements providing for their participation in the European Environment Agency (EEA) and the European Environment Information and Observatory Network (EIONET). Membership in the EEA will produce benefits for both the Candidate Countries and the EU.

The eEurope+ Action Plan obliged Candidate Countries to undertake the further development of the EIONET network for monitoring and data collection to enable access to reliable on-line data. This was necessary for effective participation in the EEA and to enable comparative analysis amongst all countries.

National Spatial Data Infrastructure

Rapid access to spatial (geographic) data and information is crucial to the economic, environmental, and social well-being of our global society. Today an ever-increasing volume of these spatially referenced data are being produced, stored, transferred, manipulated, and analyzed in digital form. Until now, maps in analog form have been a mainstay of a wide variety of applications and decision-making. This is changing as

more data and information on a wider variety of topics or themes (e.g., population, hydrology, agriculture, climate, and soil) become available in digital form.

To service those who need digital data, new digital products are appearing with greater frequency, thereby increasing quantities of spatially referenced data. With this increase comes the potential for substantial duplication of effort or the underutilization of valuable information that may have been created at considerable cost and effort.

The scope of spatial data can be enormous, and spatial data can be important components of a wide variety of scientific, technical, and social disciplines and applications. There is a need to focus our efforts on the generic issues of spatial data management, collection, and use, particularly in geographic information systems.

A major challenge over the next decade will be to enhance the accessibility, communication, and use of spatially referenced data to support a wide variety of decisions at all levels of society. Geographic referencing is needed in areas such as health, education, and social welfare, where a variety of information collected from many sources is used to track problems and identify trends. Perhaps, the most rapidly growing requirements for spatial data and information are currently in environmental management. To achieve such goals as sustainable economic development and protection is sensitive natural resources, land managers need to know what information exists, how to obtain it, and how it can be merged with information from other sources. New technologies (e.g., GIS, GPS, remote sensing, and spatial modeling) provide the capability to meet these and other needs.

By creating an effective, efficient, and widely accessible National Spatial Data Infrastructure (NSDI), data could be readily transported and easily integrated both horizontally (e.g., across environmental, economic, and institutional databases) and vertically (e.g., from local to national and eventually to global levels). However, unless the National Spatial Data Infrastructure is robust and the spatial databases, policies, and standards are in place to facilitate the access and use of spatial data nationally, opportunities in areas from environment to development are lost.

The appropriate question to address here is: What could be done better or more efficiently if the content, accuracy, organization, and control of spatial data were different? Assessment is needed that will identify general issues and impediments that need to be resolved to build an NSDI in Serbia. The problem is that there is no national policy covering spatial data nor is there a national organization or agency with the charter, authority, and vision to provide leadership of the nation's spatial data collection, use, and exchange.

Survival in an increasingly global economy, dominated by ever-larger private-public sector coalitions in countries outside Serbia, may be possible only if commitments are made to create a national policy for increased information development and sharing.

2.9. Millennium Development Goals

Serbia's National Strategy for Information Society Development (NSISD) should aim to harness the ongoing technological revolution to contribute to Serbia's achievement of the Millennium Development Goals (MDGs). The massive backlog of educational, health, extension, and social needs of Serbia, including those of the rural and isolated

communities, are unlikely to be met in a timely and effective manner without the innovative and strategic use of these new technologies. For example, the target of reducing poverty by half by 2015 in the context of a globalizing economy is unlikely to be met without addressing the implications of ICT for the competitiveness of Serbia's economy, revitalizing threatened industries such as textiles, and diversifying into new ones such as call centers and business process outsourcing.

NSISD should systematically address the opportunities to use ICT to expand employment and earning opportunities, to access market information and lower transaction costs for the poor, women, marginalized communities, small farmers, traders, and artisans. Again, ICT should be used to achieve MDGs in health and education, for example, by enhancing the delivery of basic training for health workers and teachers, by increasing information sharing about diseases, by increasing access to family planning and AIDs prevention information and services, and by increasing access of extension workers and care givers to specialist knowledge. Sustainable development goals would be promoted by applying ICT for clean technologies, economizing on the use of energy and materials in production, remote sensing for resource and environmental risk management, including local monitoring by NGOs of environmental abuses.

2.10. Issues for Aid Agencies

The ICT and knowledge revolution present many challenges and opportunities for aid agencies. Some view ICT as a threat to established sectors and ways of doing business, and there is subtle but pervasive resistance to the required changes to mainstream ICT into development.

Aid agencies could help Serbia set appropriate public policies and programs for using ICT to reform the public sector, to reach out to the poor, and to act as catalysts for ICT diffusion among SMEs and throughout the economy. They could take a strategic and holistic view of ICT, beyond ad-hoc assistance to ICT components in investment projects and stand-alone telecommunications operations. Accordingly, aid agencies could scan the global environment and draw on emerging best practices, then work with governments and local stakeholders to build local capabilities and develop home grown strategic responses that take account of global trends and practices. They could alert policy makers to the opportunities of mainstream ICT in the fight against poverty and to the need to get the enabling environmental regulations. Aid agencies could also alert them to the pitfalls of viewing ICT as a magic bullet, in isolation of complementary investments and reforms, and of adopting rigid e-development strategies not adapted to local realities and capabilities. In doing so, aid agencies must engage in partnerships and learning experiments to mobilize global and local know-how and resources, and facilitate local innovation and learning.

The shortfalls in human capacity that currently impede ICT programs in Serbia cannot be met in the short-term with local training alone. Therefore, Serbia has no choice but to combine their internal capacity building priorities with strategies for more effectively engaging external actors.

"Technical assistance" is the development professionals' euphemism for the myriad ways in which outside "experts" seek to help "local" citizens with time and skills rather than financial resources alone. In the process, so the expectation runs, these skills and

“know-how” are transferred to local actors who will eventually be able to dispense with outside assistance. The ICT for the developing countries increasingly adds to this scenario the model of “virtual” technical assistance, whereby outside experts perform this service remotely—perhaps from the other side of the world. However, the paternalistic version of this scenario where noble outsiders provide the expertise to carry out specific projects for the benefit of grateful (but incompetent) locals, and to train them in the process, seldom reflects reality. Effective transfer of skills is typically a longer and more collaborative process by which the outsider learns as much about the unique challenges of a local environment as the locals learn about the skills themselves.

3. INSTITUTIONAL FRAMEWORK FOR THE INFORMATION SOCIETY DEVELOPMENT

3.1. Introduction

The emergence of the Information Society offers amazing opportunities to achieve human development goals of personal and collective empowerment. For most developing countries and for Serbia as well, however, this will not be an automatic process. ICT Strategies are the guidelines, which are being used to chart the way toward the Information Society.

It is almost impossible to achieve any category of economic growth, private sector development and poverty reduction without reformed Public administration that will offer sufficient, effective and transparent services to the citizens and business sector. The participation of all stakeholders within the country, building the consensus between them and raising the dialog would be crucial for the success of all efforts in this area.

Governments worldwide have taken responsibility to provide national leadership in the development and application of technology in their countries. It is nether efficient not desirable to implement ICT projects across government, or in any large organization, without having a policy in place with key strategies specified. These must take account of the government's economic priorities and need for the efficient use of its own resources. This is being achieved by the establishment of an administrative structure within government, with specific responsibilities to develop a national vision for the ICT to prepare an implementation plan with key strategies having specific goals to realize the vision, and an action plan for their achievement. This section outlines the functional requirements for such an agency, and suggests interim measures that can be taken before such agencies are legally established.

The new initiative related to promotion and development of Information Society should enable Serbia to move forward in its development and fully integrate into the global economy much faster than any other technology. This approach should not only build up ICT as a sector but also facilitate rapid implementation of ICT enabled solutions in all other sectors, especially, business and civil society. Government should as well exploit ICT in its communication and services and in that manner provide efficiency and transparency in the relationship with citizens and business. This initiative should promote the use of ICT among the business sector entities and general population.

However, the achievement of the above-mentioned objectives will not be possible without establishment of the appropriate Institutional framework, which would organize, foster, and catalyze the future development in the area Information society.

3.2. Government Functions

The functions represent the three basic responsibilities that central government worldwide must accept for ICT:

- **Government as a regulator.** As the national regulator, the central government is responsible for setting national rules for the use of technology. This includes for example:

- the legal framework that enables electronic commerce to be promoted at a national level and the policing of this framework;
- the national standards governing data privacy and security;
- laws covering intellectual property;
- adopting data and communications standards to ensure country is aligned with international compatibility and interconnectivity, etc; and
- rules covering access to information sources, both national and international, and including the Internet;

- **Government as a facilitator.** As a facilitator, the government can seek to stimulate the use of and access to ICT by its citizens. It can encourage the development of the private sector industry by providing assistance and removing roadblocks to progress. The ICT services industry and other knowledge industries do not require large investments in material infrastructure like factories, raw materials, road ways and other public utilities. They can be located anywhere in a country provided there are communications facilities at par with global standards, and high quality and cost effective human resources.

- **Government as a large user of ICTs.** As a large user of ICTs, often the largest in the country, government must seek to use ICT for the cost efficient delivery of services and information to its citizens and in the efficient running of the government administration. Being a major purchaser of ICT equipment and ser vices, it can also influence the market and, for example, use its buying power to foster the development of a national ICT industry. It can also serve as an example of best practice.

3.3. Development goals

The process of development of the Institutional framework, which would enable the implementation of the National Strategy for an Information Society, should be focused on the following objectives:

- Establishment of the **Government Center for Information Society** - Governmental Cabinet level state body for Information Society which would be responsible for Information Society development, implementation of the National Strategy for an Information Society, development of the future strategies and regulations including those which are focused to eGovernance based public administration practices, and that will coordinate introduction of Information Society curriculum and standards between ministries and relevant regional and international partners.

- Establishment of the **Information Society Council** – a political body comprised of - Assistant Ministers responsible for Information society and eGovernment within Ministries (CIOs – Chief Information Officers) will provide coordination and cooperation of all Governmental bodies in the process of Information Society development and in particular eGovernment and Public Administration Reform.

- Establishment of the **Information Society Committee –** a political body chaired by the Prime Minister and comprised of the Ministers and other Governmental bodies which have been engaged in the process of Information Society

development and Public Administration Reform. The following Institutions should be engaged within the mentioned body:

- Prime Minister
- Ministry of Science and Environmental Protection
- Ministry of Public Administration and Local Self-Government
- Ministry of Finance
- Ministry of International Economic Relations
- Ministry of Capital Investments
- Government Center for Information Society
- Telecommunications Agency

- Establishment of the **Information Society Forum** – the Information Society Forum should represent the institutional framework for coordination and cooperation among all stakeholders in the country. The representatives of the Government, Business sector, Civil Society should proactively participate and cooperate regarding all future issues in the process of Information Society development. The dialog raised in relation with National Strategy for an Information Society development would be in this way preserved and it would significantly foster the future development and similar initiatives in this area.

3.4. Government Center for Information Society

1.1 The Government Center for Information Society in charge of Information Society development, in line with the Information Society Committee Information Society Council and stakeholders outside the government through public consultation, should formulate a national Information Society policy and develop a national Information Society strategy with corresponding action plans. It should develop mechanisms to encourage all stakeholders and key players to discuss Information Society issues and exchange information, experience and best practices.

1.2 The Government Center for Information Society should co-ordinate and monitor implementation of Information Society strategy in close co-operation with the Information Society Committee and the Information Society Council.

1.3 The Government Center for Information Society should have the following responsibilities:

- electronic communications infrastructure and associated services in relation with private network of the Public Administration
- electronic commerce, electronic contracts and electronic signatures
- storing, searching, retrieving and exchanging data
- security and protection of electronic communications infrastructure and data
- cyber crime
- intellectual property and related rights for databases, software and hardware
- personal data protection including protection of privacy
- access to public information
- Information Society curriculum and standards for all educational levels.
- raising awareness related to importance of an Information society development and its impact on social and economic development

1.4 The Government Center for Information Society should propose regulation, curriculum and standards for the fields, described in 1.3, and monitor their implementation.

1.5 Terms used in 1.3 should have the same meaning as in the European Commission directives pertaining to the same subjects.

1.6 The Government Center for Information Society should encourage research and development in all areas described in 1.3 by providing grants, scholarships and fellowships to public and private institutions and individuals; by organizing workshops, seminars, conferences, study ours and other activities that may contribute to fast implementation of best practices.

1.7 The Government Center for Information Society should encourage private-public partnerships to execute e- administration projects; to promote distance employment of knowledge workers through Internet and other electronic communication mechanisms; to create conditions that foster firm creation; and to encourage direct investments in the ICT sector.

Management information Service department should be the integral part of the Government Center for Information Society and should be focused on the following issues:

2.1 The Central Management Information Service (CMIS) should be a department within the Government Center for Information Society – Cabinet level state body, responsible for coordinating and monitoring implementation of an e-administration strategy.

2.2 The CMIS should:

- develop and monitor implementation of policies, standards and guidelines for execution of e-administration strategy and ensure that they are adhered to support departments and administration bodies in development of their own e-business strategies
- develop shared infrastructure and applications in collaboration with departments and administration bodies
- promote common policies on the management of information including privacy
- develop common public administration services co-ordinate training on skills for Information Society in public administration

2.3 Each cabinet department or other public administration body should have its own Management information service, responsible for development and implementation of its e-business strategy, implementation of common services, and providing information support for the department or body.

2.4 If a department or body does not have its own management information service, such a service should be organised jointly with the CMIS.

Structure of the Government Center for Information Society (GCIS)

- The organizational framework within the Government Center for Information Society should be typically small and focused. The staff will have technical and

managerial skills to develop and oversee visions, goals, strategies and project plans. The head of this group must be skilled leader and facilitator who works successfully with senior government ministers; and command respect both technically and managerially in government and industry. This person could be designated the chief information officer (CIO) – Director of the GCIS.

- The GCIS needs to be flexible, dynamic, and focused on achieving outputs. The establishment of "just another bureaucratic organization" must be avoided.
- A Prime Minister within the central government must be given responsibility for the agency and be accountable for its operation. The CIO should report directly to the Prime Minister.
- Work groups should be formed to address specific strategies and projects. These typically should be small, and be given specific tasks wit specified deliverables and goals with resources, budget, and a timeframe to complete the task. Having completed the task and delivered the product, the work groups should be abolished or reconstituted under a different set of parameters. The head of the work group should be competent and understand the specific area being considered, and be selected on the basis of knowledge and abilities. This person can come from government, private sector, academia or industry.

To perform effectively the GCIS needs to be constituted with a mandate, TORs, a budget, work plans, goals and deliverables, reporting mechanisms and measures of accountability. Developing these is a significant exercise in its own right, often supported by bilateral or multilateral aid organizations with experience in establishing their own agencies.

Autonomy of the GCIS

It is important that the GCIS operates with a high degree of autonomy and focuses on national interests, and not on narrower sector or political interests. However, to function successfully it needs to have the support and commitment from the seated government. Some of the means of achieving autonomy are:

- The agency has TOR for its responsibilities, actions, and *modus operandi* is specified and is widely publicized. The agency reports to a Prime Minister within its TOR; however, the content of such reports is entirely the responsibility of the board.
- The agency has clearly defined mechanisms of accountability.
- The agency consults widely and seeks consensus on its findings and recommendations, which are published widely in the public domain.
- The agency closely coordinate and cooperate its activities with Information Society Forum an independent body that has been established by a wide range of stakeholders – Government, Business sector, and Civil Society. The outcome of meetings between GCIS and IS Forum are published in the public domain.
- The GCIS publish newsletters and bulletins with information on its activities. These are widely disseminated to all sectors of the community.
- The GCIS is proactive in promoting itself. Members are asked to participate in seminars, give presentations, write articles for the press and journals, give press interviews, and contribute to Web site content.

Recruitment of the staff within GCIS

Finding suitable staff to work in a GCIS is a persistent problem. Some of the issues encountered and expected are:

- staff in line departments are not keen to work in a GCIS where the promotion opportunities may be far more limited – by working in an agency, they may feel they are "losing out"'
- technical staff may feel their technical skills will be diminished by working in a policy unit that is not directly involved in technology application;
- staff in the private sector usually have a significantly higher salary than government staff, and will not be attracted to work for a lower wage; and
- in government there is usually a dearth of staff with the necessary skills and experience in policy and strategy work, who have an adequate understanding of technology issues.

These drawbacks can be alleviated by:

- Seconding skilled staff from line departments for set periods (up to two years) of time to address specific tasks to which their experience is suited. Staff can be rewarded by, for example, a higher salary while on secondment, and/or recognition that the experience will improve their opportunities for promotion.
- Seconding specialists from industry and the private sector for specific period of time, with their employers continuing to pay their salaries; the government will reimburse their employers for their total cost. The employer would gain by having an employee with a better understanding of government, as well as by the publicity of having contributed to national development.
- Endeavoring to provide professional training to seconded staff and improve their professional skills.
- Hiring consultants to assist with specific projects, and ensuring there is a knowledge transfer to agency staff.
- Recognizing and acknowledging secondments as contributing to the national good.

Interim measures for the establishment of the GCIS

The formal establishment of a GCIS and associated structures, including the recruitment of staff, can take some time, not the least being the time taken for formulation and approval of the necessary legislative changes. However, it is necessary to start the process using interim resources. This can be achieved by:

- identifying a suitable minister in government who can take responsibility for and guide the creation of the GCIS;
- selecting a small number of key participants from the government bureaucracy assisted by one or two consultants or staff seconded from other departments – establish an interim structure;
- appointing an interim leader from the bureaucracy and task the team with initiating developments;
- preparing TORs for consultants to assist with the process of establishment;
- developing an outline plan for establishing the GCIS, seeking approval and commencing process of preliminary consultation targeting key individuals

(government, industry, the private sector, and academia) who would be expected to have constructive ideas and make a positive contribution;
- undertaking a survey (with interviews as necessary) to document the current status of ICT developments;
- collecting summary information of developments that have taken place internationally, targeting the most likely candidates, and obtaining detailed information, initially from the Internet but followed up, if necessary, with communication at the government-to-government level; and
- preparing a more detailed plan for establishing the GCIS, board and support structures, including budget, staff resources, TORs, levels, timeframe, and seek approval to proceed.

3.5. Information Society Council

- Information Society Council responsible for e-Government should drive forward a national e- Government strategy for creating favorable environment for e-business by modernizing public administration; ensure quality and efficient public administration services; support integration of services across organizational boundaries; promote the use of new online delivery channels; ensure that opportunities opened up by new technologies are socially inclusive; oversight the delivery of e-Government projects within public administration, including allocation of resources and procurement; make recommendations as necessary to other cabinet committees.
- The Information Society Council responsible for e-Administration should be constituted of Assistant ministers and other cabinet level public administration officials most closely concerned with matters of public administration modernization and e-administration.
- The Information Society Council for e-Government should be co-chaired by a Minister of Public Administration and Local Self-Government and Director of the Government Center for Information Society.

3.6. Information Society Committee

- The Information Society Committee should provide a framework for collective consideration of and decisions on major policy issues and issues of significant public interest in the field of Information Society. It should consider and monitor implementation of national Information Society policy and strategy as well as remove barriers and minimize risks in their implementation.
- If required, a sub-committee should be established to co-ordinate implementation of Information Society action plans and particular complex projects (across the jurisdiction of several cabinet departments and/or administration bodies).
- The Information Society Committee should be constituted of ministers and other cabinet level public administration officials most closely concerned with matters of Information Society.
- The Information Society Committee should be chaired by a Prime Minister.

3.7. Information Society Forum

- Information Society Forum would represent the independent advisory body which would organize the discussion regarding Information Society policy, strategy and issues of significant public interest. The representatives of Government,

Business sector, Academia and Civil Society should undertake proactive approach and coordinate and cooperate closely in relation to all future issues connected to Information society development and social and economic development as well. In this way the broader public consultation process based on dialog and consensus would significantly contribute to the future development process.

- It would represent the policy-oriented "Think tank" whose main role would be to propose strategic directions, give advice and recommendations concerning further development of the Information society and development of the ICT sector.
- Raising awareness related to the importance of an Information society development and its impact on social and economic development would be the focus of this institution as well.

3.8. Monitoring and Evaluation of the National Strategy for an Information Society

It is clear that the institutional location of the Department for Monitoring and Evaluation (M&E) which would be responsible for formulating and discharging M&E responsibilities may have a significant impact on its ability to do so. On one hand, such a department should not be seen by the operational entities involved in the e-strategy as 'a remote judge and censor'. On the other hand, if the team is too close to implementation tasks, it runs a distinct risk of becoming 'judge and party', and losing credibility in the process.

To perform its work efficiently, the 'M&E department' will need to receive its legitimacy from the highest levels of government, therefore the most appropriate solution in the case of current situation in Serbia would be to establish the above mentioned institution within the Government Center for Information Society and in that way secure necessary level of visibility and transparency.

The efficiency, effectiveness, transparency and the overall success in the process of achieving the objectives within the M&E department will heavily depend on the pre-existing local institutional framework and work habits of Government, Business sector, and Civil society. However, the efficiency and credibility of the M&E department will require that it base its work on the highest technical and methodological standards.

Key Activities of a Monitoring and Evaluation department within the Government Center for Information Society

Management

- Develop a formal plan and business processes, including a budget and goals/targets for staff
- Develop human resource management systems, assessing training needs of other agencies
- Conduct regular training on ICT-related Monitoring and Evaluation
- Develop internal communications and team building.

Indicator development

- Assess existing data sources and their relevance to the strategy and implementation plan.

- Recommend improvements in specific data series in terms of timeliness, coverage, or level of disaggregation.
- Develop and publish new data series.
- Ensure compliance with international standards for specific data items.
- Create new data products, for instance, presenting existing data in new ways, or including new types of analysis and discussion.
- Improve response rates for specific surveys.

Outreach

- Establish regular consultations between users and providers of statistical data.
- Establish processes to receive regular feedback from customers.
- Update statistical legislation.
- Establish links with the media.

3.9. Conclusion

With this proposal for the new Institutional framework, the existing government organizational structures and legal framework should be changed in a way to enable use of the modern technologies and thus promote the new Public management policy and Information society development.

The e-government is probably the ultimate instrument for development of effective Public Administration reform. The primary goal of ICT implementation in the government sector should be entirely the same as it was the case with business sector and e-commerce – doing more with less, reduced costs with increased efficiency. The modern Public Administration Reform requires dynamic, flexible institutions, which can respond and adjust quickly and foster development of the society and business sector.

This could be achieved only with widespread use of ICT and rising awareness among the general population. The real issue is to connect and cut boundaries between and among departments within the government bodies, between and among different levels of government (Central Government and Local Self Government entities), between and among public and private sector and at the last stage between and among the governments.

4 LEGISLATIVE FRAMEWORK

4.1 Introduction

For a successful operation of information society “where everyone can create, access, utilize and share information and knowledge, enabling individuals, communities and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life”[1], it is necessary to create a proper legal environment.

Legislation for the information society is aimed to remove barriers to competition, innovation and development and deployment of advanced services, taking into account the global trend toward convergence of voice, data and video technologies.

The legal documents necessary for unhindered development of the information society should be prepared for many areas. Telecommunication legislation is expected to pave the way to active engagement by all competent institutions in the creation of an open and competitive telecommunications market, investments in this field, the privatization of state monopolies and the development of accessible infrastructure of electronic communications networks.

When it comes to computer crime, it is necessary to pass the regulations governing the mechanisms of international cooperation in identifying and preventing criminal offences provided by the Council of Europe Convention on Cyber Crime. In this respect, special attention is to be paid to the publicity of data, their protection and the right of access to databases, along with the ways to use biometric methods of identification and electronic documents, so that they could be used as evidence in court.

The Internet-related legislation is supposed to offer solutions that would provide for unimpeded exchange of information and transactions via the Internet. It is necessary to launch the use of digital signature, allow for the authentification and authorisation of participants in the transactions, credit card operations and establish jurisdiction over the Internet transactions. In addition, it is necessary to provide for the protection of personal data and privacy, transfer of information through international systems, cryptographic protection and the protection of a user against offensive, illegal and unwanted Internet content. The new rules should also cover anti-terrorism security, money laundering, intellectual property rights and regulations on the Internet content. Appropriate taxation mechanisms should be also provided for buying and selling through the Internet.

It is also necessary to define methods to protect ICT solutions and patents, in order to prevent breaches of copyrights and patents recognised at home and abroad alike. Another priority is to encourage accountability and awareness that would reduce the abuses of information and communication technologies.

Some laws that should enable e-governance, even when they are not directly connected with it, should be changed (eg. Law on administrative procedures and a number of other acts which actualy disable it) and responsibility and finansing of institutions in charge for data updating and conditions for data accessability need to be defined.

---

1 Declaration of Principles, World Summit on the Information Society, International Telecommunication Union, Geneve, 2003.

The key role in initiating and coordinating the activities aimed to produce new regulations on the information society and establish active international cooperation (within the U.N. World Summit on the Information Society, the EU information society projects, regional initiatives such as e-SEE, etc.) should be given to an institution, which, with all financial and organisational facilities provided for, would develop consultative mechanisms for the inclusion of all parties directly concerned in the development of information society in Serbia.

The objective is to provide a legal framework, which will address legal issues concerning electronic public services and the broad use of ICT in the public sector. Legal activities at the national level should be pursued in close coordination with international developments and initiatives, in order to ensure the compatibility of national legislation with international norms, such as the *acquis communautaire,* whose implications constitute the overriding principle for the country expressing a desire to join the European Union. The achievements of information and communication technologies should be used to the utmost in creating an effective legal environment.

4.2 Harmonization with EU Legislative

The most complex task, and also the most extensive in the process of association with the EU is the harmonisation of our legal system with the EU legislation. Apart from the inaugural treaties, there are 20,000 regulations, directives and decesions from secondary legislation and 4,000 judicial decisions.

Even though the country is under no formal obligation to harmonise its regulations with the EU legislation, it has to launch the harmonisation process promptly, having in mind its committment to the EU integration, the scope of the work lying ahead of the state and its lagging behind in the overall integration process.

It would be very good to make all the laws to be passed compliant with the European Union's, unless there is some exceptional economic reason against this strategy. It is also necessary to remove or amend the laws contrary to the EU legislation, or those that constitute blatant violations of the EU standards, hindering our economic and other communication with the Union. This will raise our credibility and present the country as a responsible partner for talks on the Stabilisation and Association Agreement and, ultimately, full membership of the EU.

It is with this goal in mind that the Serbian government passes every year an Action Plan for Harmonisation of National Regulations with EU Regulations. The plan defines concrete tasks for competent ministries, and outlines tentative deadlines for them to draft necessary laws.

Furthermore, it is a duty of each administrative body or organisation in charge of drafting the legislation to endorse a statement of concurrence between the draft regulations and the EU legal heritage. The introduction of the EU *acquis communautaire* into the national legislation is by all means necessary, but it is not enough. Apart from the adoption of approximated regulations, it is necessary to endorse a system that would guarantee its effective implementation.

The Resolution on Accession to the European Union endorsed in October 2004, has placed a heavy emphasis on the harmonisation process, stressing that all activities to

this end will be prioritised by the Serbian parliament, which is also ready to introduce special procedures to make the process more efficient. Since the beginning of the year 2005, the EU Accession Office has delivered quarterly reports to the Serbian government, about the implementation of the annual action plans for the approximation of national laws with the European Union's.

4.3 Obligations from eSEE Agenda and WSIS Action Plan

As a member of the Initiative for e-South East Europe [2] (eSEE) operating within the Stability Pact for South East Europe, Serbia signed the Agenda for the Development of the Information Society in South East Europe[3] at the end of 2002. The purpose of the Agenda is to define state policy priorities and to urge the state to take the responsibility for faster development of the information society in the country and the region, modelled after the EU's successful initiatives - eEurope 2002 i eEurope 2005.[4]

eSEEurope Agenda for the Development of the Information Society calls for the adoption and implementation of Legal Infrastructure for Information Society.

- Begin the adoption and implementation of legislation on electronic communications infrastructure and associated services in accordance with the framework of the relevant European Union Directives.
- Adopt draft laws on electronic commerce, electronic contracts and electronic signatures in accordance with the framework of the relevant European Union Directives. (Law on e-signatures adopted in December 2004.)
- Sign, ratify and implement the Council of Europe Convention on Cyber Crime. (Signed in April 2005.)
- Adopt and implement intellectual property legislation on copyright, databases, patents, software and semiconductors in accordance with the framework of the relevant European Union Directives.
- Adopt and implement draft legislation on the personal data protection including the protection of privacy on the Internet in accordance with the framework of the relevant European Union Directives.

Harmonization of national legislation with the EU law

The European Union's objective is to create conditions for the development of economy based on the production of knowledge and the development of information society.

The process of institutional association of a state with the European Union, with a view to its acession to, and, ultimately, full membership of the Union, entails the adoption of the EU law (*acquis communautaire*) – a set of secondary legislation adopted by the relevant EU institutions. They are usually referred to as the total body of EU law. Adopting these rules boils down to harmonizing domestic legislation with the EU law and, to a certain extent, with other "measures and activities", principles and practice of the Court of Justice, falling within the scope of the EU acquis.

[2] Electron South Eastern Europe Initiative, http://www.eseeinitiative.org

[3] „eSEEurope Agenda for the Development of the Information Society: a cooperative effort to implement the Information Society in South Eastern Europe", http://www.eseeuropeconference.org/agenda.html

[4] eEurope 2002 and eEurope 2005, http://europa.eu.int/information_society/eeurope/

Apart from adopting national regulations whose formal or normative solutions have been sufficiently approximated with the EU legislation, it is necessary to create conditions and institutional capacities for their interpretation, intentional respect or mandatory enforcement before judicial or administrative authorities. Viewed in this way, the harmonisation process involves the methods and techniques that facilitate incorporating the EU legal heritage into a national legal system, the insertion of EU rules in the local legal system and their implementation that from an individual viewpoint manifests itself through the exercise of individual rights or the acceptance of concrete liabilities.

Legal grounds for the harmonisation process and its purposes have been set forth by the EC Treaty, which called for the harmonization of laws and by-laws, as well as administrative measures needed for the creation of a common market.

From a legal point of view, the Republic of Serbia and the State Union of Serbia and Montenegro haven't formally undertaken to harmonize their regulations with the European Union's. However, the Serbian parliament endorsed in October 2004 the Resolution on Accession to the European Union, which, *inter alia*, defined its obligation to prioritise the harmonisation process, including special procedures to facilitate it. Furthermore, the Constitutional Charter offers another legal argument in favour of the harmonisation process. Namely, the goals of Serbia and Montenegro stipulated by the Charter include "integration into the European structures, the European Union in particular," and "harmonisation of regulations and practice with European and international standards."

The state union and the Republic of Serbia will formally accept the duty to harmonise their laws with the Union's only when they signed the Stabilisation and Association Agreement (SAA). Until then, the approximation remains just a voluntary process supposed to create conditions for implementing reforms in the political, economic and legal systems of Serbia and the state union. In Serbia's legal policy, it has a development and formal function at this point.

The states willing to join the European integration process should follow recommendations defined in the so-called White Paper II, listing 23 areas for approximation. However, full membership requires the harmonisation of national rules and regulations with the EU legislation in another eight areas, that is, a total of 31 areas.

The harmonisation process has been almost entirely limited to the regulations governing a free movement of goods, capital and people, the free supply of services and the laws covered by appropriate joint policies. In other words, the approximation process covers national regulations related to the establishment and operation of the internal market. It is clear that not all domestic laws will be suitable for the process, nor they need to be.

The harmonisation is a time-consuming process developing in several phases, the duration of which depends on the existing social infrastructure and the deadlines set by a SAA agreement.

The first two phases, including the identification of the areas of EU law and a list of *acquis communautaire* that national regulations are possible and required to be harmonised with – have been completed already within a special project titled "Harmonisation of Domestic Legislation with EU Law," which was finished at the end of

2003. The results of the project have been compiled and represented in special tables (harmonigrams) for the regulations from 23 areas set out in the White Paper II.

Besides, a preliminary assessment has been given of the approximation of a national regulation with the matching EU rule, defining if it has been fully or partially harmonised with it, or not at all, and if a corresponding local regulation exists or not, also offering a brief explanation of the level of approximation. This analysis should be complemented with a study of the approximation of regulations from the other areas, which were later included in the EU legal heritage (a total of 31 areas), and use the results as a proceeding point in amending a regulation or endorsing a new, harmonised one. Based on such a comprehensive analysis, a sequence of priorities should be established for the adoption and implementation of harmonised national laws.

In this respect, the Government of the Republic of Serbia adopts annual Action Plans for the Harmonization of Regulations of the Republic of Serbia with the Regulations of the European Union by the Adoption of New Laws of through Amendments to the Existing Laws. A heavy emphasis has been placed on the internal market legislation, covering a free flow of people, goods, capital and services, trade rules, banking, intellectual and industrial property, public procurement, standardisation, consumer protection and the environment.

On the other hand, some domestic commercial and legal regulations have been largely harmonised as part of the country's preparations to join the World Trade Organisation, whereas some regulations have been excluded from the process by the nature of things or for the reasons of implementation.

The approximation technique depends on which regulation a domestic piece of legislation is to be harmonised with. If it is harmonised with a specific EU regulation, the latter is entirely taken over in most cases. If harmonised with directives, local authorities have the discretionary power to choose a proper legal instrument and mode.

The approximation process is monitored by internal and external mechanisms. The internal mechanism used at the moment is the Statement on Harmonisation of a Legal Act with EU Regulations, but after the signing of the Stabilisation and Association Agreement, the procedure will require a Comparative Review of Concurrence Between Provisions of Draft Regulations with EU Regulations.

Based on the list of all national regulations subject to approximation, a list of relevant EU regulations and the assessment of harmonisation levels, the competent ministries should draft proposals for amending the existing legislation or adopting new ones, or suggest other measures. In order to fulfill these tasks, capacity building and empowerment need to be carried out in all the ministries taking part in the analysis of the harmonisation of relevant national laws.

Since the approximation process calls for good understanding of the EU legislation, it should be translated into Serbian, and national regulations into English. The two processes are interrelated, requiring a well-coordinated, timely and very serious approach, having in mind that *acquis communautaire* contain tens of thousands of pages.

A systematic translation effort was launched in 2004, when the pilot project "Translation and Legal and Linguistic Editing of the EU Legal Heritage" get off the ground in the state union. Before that, no significant translation had been carried out in Serbia and Montenegro.

The project resulted in linguistically and legally edited translations of more than 2,000 pages of EU legal documents, information about each of them (the name in Serbian and English, the CELEX number, the area the regulation covers, the number of pages of the original and the translation, etc.), the personal data of the translatior and "expert reader", controversial terminology, a glossary of terms from the documents translated already and a record of translations. A "Guide to Translation of EU Legal Documents" was later adopted to offer the guidelines of the format and standard of translated documents, instructions for a translator, a list of acronyms based on Eurovoc and the templates of certain legal documents.

Apart from the parallel translations into Serbian and English, an institution responsible for the translations should be assigned, cooperation and coordination established between the competent bodies of the state union and the member states and a list of priorities made in accordance with the planned harmonisation process. The translations should mirror standardized terminology, procedure and methodology. In this context, it is necessary to provide for specialised glossaries for specific areas. In order to step up the process, a network of translators needs to be created outside the state administration, with coordinated proof-reading of all translations. Moreover, the complexity of the effort requires permanent training programs for the translators, proof-readers and linguists and improve the translations through cooperation with the states of the region and by analysing the experiences of other countries.

4.4 Specifics of Serbian Legal System

The harmonisation of the national political and legal systems with the EU standards in the wake of the 2000 democratic change changed the Serbian political system considerably. Serbia has entered an era of civic democracy, the rule of law and respect for institutions, even though much is left to be desired in fulfilling this complex, heterogeneous and probably the most important criteria for joining the Union.

The shortcomings and problems are reflected in the process of developing a proper legal framework and in the operation of the political system as a whole. In the legal field, the most pronounced weakness is the lack of an adequate constitutional framework for the Republic of Serbia. The fact that a new constitution hasn't been promulgated mirrors in good part the lack of political consensus, not only on specific solutions to be incorporated in the state's ultimate legal act, but also on who should promulgate the new constitution and how. Moreover, Serbia as a member state of the State Union of Serbia and Montenegro has undertaken to harmonise its constitution with the new one. The deadline has been missed due to a series of problems in reaching a political consensus for Serbia's new constitution. All state union institutions have opened their doors already, and owing to the Agreement on the Constitutional Charter Review, the Parliament of Serbia and Montenegro has safeguarded its legitimacy, despite a failure to call a vote for the joint parliament.

4.5 Current State of eLegislation

Legislative, policy and regulatory environment of Serbia which is necessary for lawful and proper ICT application in all segments of industry and economy is yet to be completed. The legal system must be brought in line with the EU law. Privacy protection and data handling, intellectual property rights, criminal code, contract law, electronic signature law, electronic commerce law, telecommunications law and many others, need to be enacted to provide a secure and stable business environment attractive to foreign investors. On the other hand, some modern and well-written laws, such as those providing for intellectual property protection, have been tabled already, but they still lack enforcement mechanisms. It is not enough just to pass the laws. For their proper enforcement political will, funds and expertise must be secured.

More details on the existing regulations follow.

Law on Telecommunications

The domain of telecommunication services has been covered by the Law on Telecommunications adopted in April 2003 ("Official Gazette" No. 44/03). This Law has provided for a new regulatory body (the Agency for Telecommunications) and instruments for fostering competition, but the new authority hasn't been created yet. Its managing board was formed two years later than it should have been, in May 2005.

The Law has been partly adjusted to the First European Telecommunications Framework. Appropriate legislation for its implementation hasn't been produced, and the agency is yet to draft it. Members of the Agency Managing Board were appointed by the Government, without a public consultation process, leaving the requirement of transparency unadressed. Consumer rights and local loop unbundling are not fully regulated by this Law, which is in clear contravention of EU regulations.

The new legal framework needs to be implemented, which also implies a strategy for the development of telecommunications that is being drafted at this point, and a comprehensive institutional reform. The 2004 Action Plan for Legal Harmonisation included the adoption of the Law on Amendments to the Telecommunications Act. The amendments primarily pertained to organisational issues, instead of legal harmonisation. The Ministry of Capital Investment is the proponent of this piece of legislation.

Telekom Srbija has an exclusive right to render the existing and new fixed telecommunications services to users in the Republic of Serbia until June 9, 2005. This exclusive right does not affect the Internet-based services, multimedia services, radio or television broadcasts or cable television. They can be provided freely and under equal conditions according to the provisions of the law. The Agency shall issue a general authorization to any person whose intention is to operate a public telecommunications network or provide public telecommunications services, if he/she has met or agreed to meet all requirements prescribed for that network or service. The general authorization shall be particularly issued for Internet Service Providers.

Mobile phone services are rendered by two companies – Mobtel and Telekom, with PTT Srbija co-owning both of them. Even though the two operators have been successful, their unclear ownership remains to be the problem, as well as a number of conflicts of

interests. Telekom Srbija should be restructured and the ownership structure and the role of the state in the two major operators clarified.

Even though there is no legal framework for the Internet-based services, dozens of Internet providers operate in Serbia at this point. First-level providers provide for the Internet services directly from abroad, while second- and third-level providers buy the capacities directly from them.

The Law on Telecommunications is the first law that regulates the Internet service as a public telecommunications service materialised by applying the Internet technology. Convergent technologies (VoIP) are not regulated by this Law. This Law prescribes one license per one telecom service provider. This implies that Telekom Srbija will probably be split into at least three companies.

The Law on telecommunications has defined a regulatory framework for the introduction of a universal service. Under the law, Telekom Serbia is obliged to provide for the universal service until its exclusive rights expire, but it is not entitled to the recovery of costs from the universal service reimbursement fund. This clearly calls for new regulations to facilitate the development of the universal service. The Telecommunications Agency and the Broadcasting Agency should ensure each within its competence, separate funds for the universal and public broadcasting service.

A poor situation in the area of satellite systems is the consequence of unregulated development in the 1990s and war destructions. The main satellite centre in Ivanjica and another satellite post in Krnjaca were devastated. The Ivanjica facilities were rebuilt, but the centre hasn't been reopened since. A number of institutions, including Telekom, have been properly licensed, but many work on the basis of inadequate licenses. In order for the satellite communications market to be liberalised, it is necessary to pass a number of by-laws to simplify the licensing procedure. Accordingly, specific regulations are required to define minimum technical requirements to be met by the satellite communications systems and equipment, in line with the rules of the International Telecommunications Union (ITU) and the European Union.

Due to deficient legal regulations in the field of cable distribution systems, there are no accurate statistics on the number of KDS operators and subscribers.

Serbia's broadcasting systems were severely damaged during the 1999 bombing, too. A chaotic situation in the allocation of radio frequences is a particular problem. A few hundred radio and television stations operate without proper licenses. What allowed for such a development is that the Telecommunications Act is still a dead letter, while additional regulations have yet to be passed. It is necessary to sort out the situation in the radio broadcasting specter, which requires an internationally harmonised Plan for Frequences Allocation (a digital and analogous plan). ITU governents adopted a special ITU Resolution 126 to restore the broadcasting public service, and Serbia completed the General Project for Restoration of Public Broadcasting System in 2003.

Law on Public Information

The Law on Public Information (Official Gazette 43/03) is the first law in Serbia that defines the Internet as a public medium. According to that law, media outlets include newspapers, radio and television programs, news agency services, the Internet and

other electronic editions of media outlets as well as other public information media that use words, images and sound to publish ideas, information and opinions intended for public dissemination, and to be used by an unspecified number of users.

Law on Electronic Crime

The amended Criminal Code (Official Gazette 39/03 and 67/03) regulates criminal offences threatening the safety of computer data. It covers seven new criminal offences against the security of computer networks, systems and data – unauthorised use of computers and computer networks, computer sabotage, creation and spreading of computer viruses, computer fraud, disruption of electronic data processing and transmission, unauthorised access to a protected computer or computer network, and protection against unauthorised limits to the access of public computer networks. The Criminal Code also covers criminal offences related to software piracy.

The amendments to the Criminal Code are in accordance with the basic recommendations of the Council of Europe (CoE). However, they are not in full compliance with the CoE Convention on Cyber Crime. This convention was signed in April 2005, but it hasn't been ratified by the Parliament of Serbia and Montenegro. After the ratification, however, national cyber crime regulations will have to be approximated with the Union's, which will require the introduction of additional mechanisms.

The Convention primarily defines different forms of cyber crime, obliging the member states of the Council of Europe and the European Union to cooperate in combating it. Developed European countries are expected to help their less developed neighbors, particularly in terms of training and technical equipment.

Law on Copyrights and Related Rights

The Yugoslav Law on Copyrights and Related Rights passed in 1998, does not establish any condition for consideration of copyrights by the government (for acquiring copyrights). Therefore, neither the number of subjects of legal copyrights, nor the number of subjects on the protection of related rights is known (the right of interpreters, manufacturer of phonograms, manufacturer of videograms, manufacturer of the programs and manufacturer of databases). Property rights of music pieces are handled by the Association of the Yugoslav composers (SOKOJ).

This law hardly applies in Serbia and is not functional at a national scale. Judicial staff requires proper training to prepare them for the Internet age, and the Copyright Law itself is not adjusted to the period of transition.

At the moment, Microsoft (and BSA) claims a successful software legalisation campaign. (The Serbian government has recognised Microsoft as a valuable partner.) Hopefully, this is just a beginning. The new Copyright Law that has been passed recently, meets the modern standards and is in line with the EU recommendations and WTO TRIPS.

Law on Protection of Personal Data

The right to the protection of personal information is guaranteed by the Constitution of the Republic of Serbia (Official Gazette of the Republic of Serbia No. 6/03) and the Charter of Human and Minority Rights and Civil Liberties (Official Gazette of Serbia and

Montenegro No. 1/90). Under the two documents, law-makers have an obligation to govern the protecton of personal data by a special law.

The existing Law on the Protection of Personal Data (Official Gazette of the Federal Republic of Yugoslavia No. 24/98 and 26/98) is rather defective, ambiguous and far from the EU standards. Since it is impossible to improve it, a new one should be drafted. To make matters worse, the existing piece of legislation has never been applied at all.

This law is also necessary for signing an agreement with Europol and unimpeded exchange of information with other states. It is also necessary to accept the standards provided by the CoE Convention 108 and the EU Directive 46/95 to ensure a free flow of personal data.

Protection of Intellectual Property

This area has been covered by the Law on the Protection of Intellectual Property and the Criminal Code. Neither is in full compliance with international regulations, but at least the basic provisions are in place. This Law covers protection of software products as well.

Since the Constitutional Charter of Serbia and Montenegro covers, *inter alia*, standardisation, intelelctual property, measures and precisous metals and statistics, the Ministry for Internal Economic Relations of Serbia and Montenegro and the Intellectual Property Office proposed a number of laws regulating the protection of intellectual property. The Parliament of Serbia and Montenegro adopted five laws in this area in 2004, namely, the Law on Patents (Official Gazette of Serbia and Montenegro No. 32/04), the Law on Copyrights and Related Rights, the Law on Stamps, the Law on Topography of Integrated Circuits and the Law on Legal Protection of Designs (Official Gazette of Serbia and Montenegro No. 61/04). (The same Ministry prepared the Law on Geographic Marks of Origin, but the Parliament of Serbia and Montenegro hasn't passed it yet.)

The aforementioned laws were drafted with full respect to international standards, the rules of the World Trade Organisation and the European Union in particular. Intellectual property laws have been harmonised with WTO special agreements to protect intellectual property (TRIPs).

Full implementations of these regulations haven’t been entirely possible in the member states, because they failed to specify penalties. (Instead, the member states are to define the fines by their own regulations.) In addition, market inspections and financial police were not authorised to implement confiscation measures in the cases of intellectual property violations. The relevant legislation applicable in Serbia is embodied in the Law on Conditions for Commodity Trade, Services in Commodity Trade and Inspectorates (Official Gazette of the Republic of Serbia Nos 39/06, 20/97 and 46/98). This is why a draft law on implementation of regulations governing the protection of intellectual property rights has been prepared. It has authorised market inspections to confiscate and keep falsified products in the cases of intellectual property violations. Moreover, the law has specified appropriate penalties and fines.

The implementation of intellectual property rules has been governed by the Customs Act (Official Gazette of the Republic of Serbia No 73/03) and the Criminal Code (Official Gazette of the Republic of Serbia 39/03 and 67/03). The Customs Act stipulates in detail

a number of measures to protect intellectual property at the border. The 2003 Criminal Code has for the first time defined as criminal offences the unauthorised use of copyrights and related rights and crimes against the sacurity of computer data.

A draft criminal code of the Republic of Serbia has defined criminal offenses against intellectual property rights as a special group of criminal offenses. In this way, the protection of intellectual property has been expanded, because apart from copyrights and related rights, the new legislation has also covered other intellectual property rights (seals, patents, desings, geographic origin, and the like).

The Serbian government established in 2003 the Anti-Piracy Commission as a working body within the Ministry of Culture. At the end of 2004, the Commission was reorganised as to include representatives of the Ministry of Interior, the Ministry of Trade, Tourism and Services (market inspectorates), the Customs Administration, the Ministry of Justice and the Ministry of Culture.

Early in 2005, the government established a commission responsible for the destruction of confiscated CDs, movies and computer programs, which operates as part of the Ministry of Trade, Tourism and Services. Members of the Commission have been also elected from the Ministry of Interior, the Ministry of Trade, Tourism and Services (market inspectorates), the Customs Administration, the Ministry of Justice and the Ministry of Culture.

Broadcasting Law

Broadcasting operations in Serbia have been covered by the Broadcasting Law, the Law on Public Information and the Law on Telecommunications. A new Broadcasting Law was adopted in July 2002. The Law has provided for the establishment of an independent Broadcasting Agency as a main regulatory body authorised to supervise broadcasters and allocate broadcasting licenses. The aim of the Agency is to democratise electronic media in line with the prevailing European standards. Broadcasters will apply for licenses and frequencies in a public tender and under the same terms. The Serbian Broadcasting Corporation (Radio televizija Srbije, RTS) and the RTV Novi Sad state broadcaster were expected to develop into public services, but repeated delays in the implementation of the broadcasting act have blocked the transformation.

The Serbian population currently receives programmes from more than 1000 television and radio stations, with different coverage across the republic. The state owns one national broadcaster, Radio Televizija Srbije (RTS), and a number of local stations. It is very difficult to provide a genuine picture of the Serbian media community, because most of electronic media work without any broadcasting license at all. Within a strategy for the development of the broadcasting sector in Serbia, the major objective is the allocation of licenses for the use of fixed broadcasting frequencies, which is the responsibility of the Broadcasting Agency.

In order to prevent over concentration of capital in the media sector and monopolies, it is very important to control the establishment of media. The problem is, however, that relevant provisions on transparency, the origin of capital and ownership are still missing.

The Broadcasting Agency is supposed to prepare a plan, anounce a public invitation for the allocation of available frequences and set up clear procedures and terms for obtaining a broadcasting license. The Telecommunications Agency needs to make a plan and a distribution agenda for the allocation of broadcasting frequences. In order for the frequences to be distributed properly, the broadcasters will have to define their programmes very clearly. Pursuant to the Broadcasting Law, they can air their complete program schedule, including news, research, educational, cultural, entertaining and sports programs), specialised programs or just opt for advertising and sale only.

In the area of sound and video production, it is necessary to define a firm legal framework for the production and distribution of optical discs, and develop efficient mechanisms to combat piracy. Inadequate penalties for radio piracy constitute a major difficulty. Before it joins the European Union, Serbia will have to harmonise its laws with the EU Directive Television Without Frontiers.

Law on Electronic Business

This Law and another four relevant regulations are in full compliance with the EU rules, but they are still waiting to be cleared through the parliament. The Law on e-Commerce and Data Protection is being prepared to be sent to Parliament for adoption.

The Law on Digital Signature is of great importance for any form of B2B, B2C and e-government development. It entered the parliamentary procedure a couple of years ago, but wasn't adopted before late in 2004. This law is in line with common practices and regulations in the EU and the United States, and various players are preparing themselves for the implementation phase (Certification Authorities). This is one of several acts that constitute a legal framework for e-commerce.

There is no specific regulation or law to cover electronic commerce, and the Law on Digital Signature is believed to be the first step in this direction.

No systematic approach has been taken towards local electronic payments as yet. Business players rely on the National Bank of Yugoslavia Ordinance on Electronic Payments and the Law on Payment Operations (Official Gazette of the Federal Republic of Yugoslavia No. 3/02). While issuing payment cards, local banks rely on the Law on Banks and Other Financial Organisations, international standards and experiences.

In order to govern properly the e-payment area under the Harmonisation Programme, it is necessary to take into account the European Commission Recommendation No. 87/598 on a European code of conduct related to electronic payments and the EC Recommendation No. 88/590 defining the relationship between cardholders and card issuers.

Law on the Agency for Academic and Research IT Network

This Law specifies responsibilities of the Agency, including the development and coordination of the Academic and Research IT Network.

Law on Access to Information

The Law on access to information (Official Gazette 120/04) is in conformity with international standards. There are some reservations regarding the government's capacity to effectively implement the provisions of this Law.

Laws on Standardisation and Technical Regulations

Standardisation falls within the competence of the state union, or more specifically, the Ministry for Internal Economic Relations of Serbia and Montenegro. This area has been covered by the Standardisation Law (Official Gazette of the Federal Republic of Yugoslavia Nos. 30/96, 59/98, 70/01, 8/03) and the Law on Units and Measurements (Official Gazette of the Federal Republic of Yugoslavia Nos. 80/94, 83/94, 28/96, 12/98), which were passed at the federal level. According to a European model, the standardisation area has been covered by several laws. The suggestion is that instead of the two laws, the following four be adopted – the Law on Standardisation, the Law on Technical Requirements for Products and Assessment of Compliance, the Law on Accreditation and the Law on Metrology. This area is of key importance for the country's exports to the European Union and WTO members. The existing national legislation is obsolete, passed by the assemblies of the Socialist Federal Republic of Yugoslavia or the Federal Republic of Yugoslavia. There are some 8,000 technical regulations and standards to be adopted, in order to ensure the competitiveness of our products abroad.

There is also a belief that certain powers covering technical regulations, such as the endorsement of technical rules and the appointment of a body to assess compliance should be transferred from the state union to the member states. The member states would keep a record of all technical regulations valid in the territory of Serbia and Montenegro.

Law on Advertising

This Law (Official Gazette 79/05) regulates the dissemination of advertisements via traditional media (press, radio, TV), billboards, voice phone and fax. However, it does not provide for any protection against unsolicited electronic messages (the Internet-based, e-mail, SMS, MMS and other multimedia messages).

4.6 Vision

ICT is the most important development component of modern world and valuable foundation of information society. In developed countries its use and implementation is based on optimally arranged regulations and international standards that create stable and predictable legislative environment with laws that are clearly formulated, transparent, nondiscriminatory and technologically neutral.

This means that changes of existing legal system are necessary if Serbia is to become modern and prosperous state with the characteristics of information society.

Key Steps to a New e-legislation are harmonization with EU legislative, fulfilling the obligations from eSEE Agenda and WSIS Action plan, amending existing laws and adopting new laws and by-laws.

5. Telecommunications Infrastructure[5]

5.1 The National Electronic Communications Infrastructure

The national information and communication infrastructure is the backbone of the Information Society. In its broadest sense it comprises wired, wireless, satellite telecommunications, computer networks, transmission and switching systems, digital television, a wide range of terminal equipment as well as software services and applications, databases, electronic files and digital libraries. This infrastructure enables fast, friendly and low-cost storage, retrieval, handling and processing of digitised information in the form of voice, data, video, animations etc.

The constituent parts of a national communications infrastructure should aim at a comprehensive service platform contributing to the development of the economy and the society. For enterprises, the communication networks and new technologies are tools for modernisation and competitiveness. For the citizen, they represent the means for better access information and improvement of his/her quality of life. For society, they offer new methods of communication and social dialogue, enhancement of democracy and reduction of social and geographical discriminations. For the country as a whole, they offer the ability to promote and enhance views and interests, safeguard cultural heritage and identity, and keep close contact with expatriates.

5.2 Communications Policy

The development of the basic telecommunications infrastructure was in the past undertaken through public funds in the framework of the investment plans of the incumbent public telecom operator. The evolution of technology and the liberalisation of telecommunications imply that the future development of the telecommunications infrastructure (e.g. basic telephony infrastructure, added value services, mobile telephony, Internet access) will be achieved with both public and private sector investments.

Public Private Partnerships constitute a successful vehicle for Telecom infrastructure development. This will be achieved with the help of a regulatory framework that favours free competition and thus operates as an incentive for the delivery of improved services at lower cost. The objective is to create the conditions that are necessary for the widespread provision of advanced telecommunication services at a reasonable cost. To obtain this goal, the government should pursue a telecommunications policy with multiple goals, the most important being:

- Liberalisation in the telecommunications sector and harmonisation of the institutional framework with that of the European Union countries
- Provision of universal service and support of the development of new integrated services

[5] The text has been quoted from the document: *National Information Society Polices: eSEEurope Initiative Common Guidelines, 2003*. This has been done in the context of the current activities of the Government of Serbia focused on the development of the National Strategy for Telecommunications, which would resolve all issues within the Telecommunications sector. The common principle is that this document would provide the baseline for the future development activities related to infrastructure which is crucial for the Information Society in Serbia.

- Further development of telecommunication infrastructure with the emphasis put on infrastructure enabling the provision of broadband services, particularly in remote areas and underdeveloped parts of the country
- Exploitation of the dynamic character of the new technologies in order to "leapfrog" the distance to the developed countries,
- Participation in the new Global Information Economy

5.3 Regulatory Framework

The strategic option for the legislator should be to separate the regulatory function of telecommunications from the policy one. This will result to a clear operating framework for telecommunication companies which can change according to market conditions in order to provide better services to the citizens. This should facilitate and attract new foreign investment towards SEE countries.

The qualitative and quantitative assessment of infrastructure requirements calls for co-operation between public entities, organisations, private companies, and professional and local authorities. Government policy should attempt to ensure that actions complement one another, with optimal use of resources, in a competition-friendly environment.

As a large user and provider of information services, the state (public administration, public services, and local government) will continue to play an important role in the development of the infrastructure. By selecting modern ways of communication and transaction with citizens and firms, it demonstrates the necessity of adopting new approaches and diffuses new communication methods, such as electronic mail, electronic payments, electronic transactions and electronic business.

5.4 Developments in telecommunications

5.4.1 An Environment of Technological Convergence

Digital technology allows today the provision by the same network of conventional and new services of higher impact as well as the use of terminals combining uses that nowadays are provided by specialised devices. The combination of market liberalisation with the convergence of technologies gives users the ability to select both their preferred service payment and the service provider.

Trends in Infrastructure Development

- Full and complete dominance of digital technologies.
- Development of intelligent systems with the appropriate software.
- Dominant position of European standards in world mobile telecommunications.
- Considerable development of terminal satellite systems (mobile satellite communications and satellite TV)
- Dynamic growth of broadband Internet as a predominant way for the transmission of information and as a common communication network in our society.
- Recognition of the necessities for security and trust on the networks and wide spread of appropriate techniques such as PKT and cryptography.

- Significant developments in television and in content distribution and management technologies.
- "e-inclusion" recognition
- Significant changes and developments in the provision of market services with new roles for service providers.
- Production of packages combining entertainment, mobile and stationary telephony by different suppliers.
- "Always connected" concept
- The disappearing computer

5.4.2 New business entities

International frames show that in order to increase the range of services provided to the user, strategic alliances will be established between different entities in the information industry. Such alliances and relations will define the new business entities in the Information Society.

5.4.3 New services, a new regulatory environment

In the new, liberalised telecommunications environment the role and function of public telecommunication operators and regulatory authorities are changing. On an international scale, many telecommunication operators are starting to specialise in specific categories of services and applications through agreements with other suppliers such as information providers. At the same time, in the context of the changing relation between content transmission services and content provision services, governments are reviewing the regulatory framework and the principles governing licensing, access and use of infrastructures and offered services. The new E.U. package planned to be set into force by the E.U. member states on June 2003, calls for a less regulated market. West Balkans Countries have the opportunity to leapfrog intermediate steps and comply directly to the new directives.

5.5 Future Trends in Technology

5.5.1 Fixed Line Communication

Voice

Current state: Voice over PSTN / ISDN
Future trend: Voice over IP (VoIP) is the technology that promises to turn the old telecoms world upside down. The grey market for VoIP tends to be small starts that have a connection both to the internet to the local PSTN. With the help of VoIP backbone operators can offer international and interregional call termination and origination at a fraction of the cost that the region's incumbents charge. It is estimated that deploying VoIP costs around 550€ per subscriber compared to around 900€ for PSTN. Many cable operators have already introduced commercial IP telephony services. Six per cent of all international voice traffic is now IP-based.

Data-Internet

Current State: Access to Internet via PSTN or ISDN connections

Future trend: Broadband access to Internet is offered through digital subscriber line (xDSL). Asymmetrical Digital Subscriber Line (ADSL) is one of the variety of xDSL systems built upon the existing twisted-pair telephone subscriber loop plant. The capabilities of the ADSL are well suited to the concept of a video-on –demand service.

Optical transmission

Over the past few years, optics has established itself as one of the basic communication network technologies as a result of the conjunction of several key technological innovations (optical fiber, semiconductor lasers) and market needs. Thanks to Wavelength Division Multiplexing (WDM), optical transmission now makes it possible to transmit enormous amounts of information over unlimited distances. As far as transmission capacity is concerned, fibre has no competition. Even though recent cuts in capital expenditure have slowed down progress in this field, the fundamental trends in telecommunications will inevitably bring optical technologies.

Cable Internet

Broadband access to the Internet by cable modem promises users lightning-fast download speeds and an always-on connection. The cable modem connects to the subscriber's personal computer's Ethernet port. It utilizes coaxial cables entering subscriber's premises to simultaneously deliver cable TV programs, access to the Internet, and also provide voice telephony. The use of optical fibre in trunk network will be an addition in the development of these types of services. Many operators are actively seeking to upgrade their analogue networks to offer broadband Internet access via cable modem.

5.5.2 Wireless Communication

Current State: The 2nd generation of mobile communications has proved a great success over the past decade as a result of its ability to meet user demands for global mobility of voice, roaming and messaging with an acceptable quality. GPRS is a stepping-stone on the way to 3G. It offers wideband wireless connection to Internet from mobile phones supported this protocol. According to recent reports there will be 110 million GPRS users across Western Europe by 2006 representing 35 percent of all cellular subscribers.

Future trends: Wireless Internet, 3G, all-IP networks. Wireless Internet is an exciting new opportunity that brings together the convenience of mobility and the rich multimedia content of the Internet. Delivering the promise of Wireless Internet will become a market reality only if we reach the ambitious objective of offering communications services anywhere, anytime, but not at any cost.

UMTS is a Third Generation standard for mobile communications. It will able to support high quality bit rate services, for Internet access, videoconferencing etc. A key question for operators moving to UMTS, is how this can be achieved in the most cost-effective way protecting investments in existing infrastructure and ensuring a smooth transition to the technologies and services of the future. Experience gained via mobile services such as WAP can give us an idea of the types of 3G services that can expected in the future based on the UMTS delivery platforms.

It is expected that the number of mobiles subscribers globally will have tripled by 2005 and the traffic generated by each user will have doubled, leading to a six fold increase in overall network traffic. In areas with high mobile penetration, like Western Europe, the balance between packet and circuit switched will turn towards packet dominated even quicker. In addition 3G applications and services will have widely variance requirements in terms of data speeds and bandwidths. The combination of high traffic levels and constantly variable demand can only be efficiently handled by evolving the network to all-IP networks. In all IP solution, the backbone network is essentially a very high capacity IP fibre transmission system. Operators will benefit in terms of revenues from implementing all IP networks. An all-IP network is inherently better suited for future applications of the mobile information society.

Wireless broadband technology can offer the most cost-effective means of providing high-capacity, high-speed, data, voice, video, and Internet services. Broadband Wireless Access fills a gap for providing high-speed network access. It allows coverage areas to easily expand as customer demands warrant and provides one of he best ways to establish high speed networks services without the cost or longer deployment time associated with cable or fibre infrastructure. W-LAN technologies, can hook up to any IP backbone, is a solution for the future wireless broadband access offering up to 54Mbps in indoor environments.

Broadband services in the Information Society

The development of broadband is a determinant factor for the development of the Information Society, according to the guidelines and strategic texts published by the EU and the OECD. The entire Operational Programme for the Information Society is characterized by a variety of actions for the development of broadband in areas like education, public administration, health and business, with an emphasis on the regions and remote areas. Recognizing the importance of broadband services in the development of the Information Society in SEE countries, the governments should within the next years be co-ordinating the various related actions in collaboration with the private sector.

5.5.3 Satellite-based Internet systems

In a satellite-based Internet system, satellites are used to interconnect heterogeneous network segments and to provide ubiquitous direct Internet access to homes and businesses. It is particularly attractive to point-to-multipoint and multipoint-to-multipoint communications, especially in broadband multimedia applications. The idea of using satellites as a solution of the last mile problem, inspired by the usage of cost-effective VSATs and improvements in satellite technologies, is relative new.

5.5.4. Conclusion

As a conclusion, all-IP networks will be the future in telecommunications market. The use of fibre optic makes possible the wired broadband Internet access with a high quality. 3G systems could be a solution for the wireless access to Internet that will impact specially in rural or remote areas, in the Eastern European countries and the other emerging economies where the cost of a wired access would make impossible the provision of advanced data services. W-LAN systems can be an addition to the future

3G systems in local areas offering broadband connectivity and easy access to Internet and Intranets without requiring wiring. Alternative solutions to the high speed Internet access can be Satellite-based systems and the cable technologies.

5.6 Basic principles in developing a national telecommunications infrastructure

5.6.1 Access to networks and information

Users and those wishing to provide services should have access to networks and to information. For achieving this goal, specific regulatory and technological guidelines (e.g. establishment of standards) need to be promoted nationally, regionally and internationally.

5.6.2 Promoting competition

Promoting and protecting competition is of decisive importance for infrastructure development, especially in an environment of technological convergence. For this it is necessary to elaborate specific rules for terminal equipment, software operating systems and transmission networks. Given that the structure and the characteristics of the market are dynamic and rapidly changing, such measures must be constantly monitored and adjusted. In regard to competition there should also ex-ante measures that can contribute to the promotion of a competitive environment and avoidance of the abuse of dominant positions. In this context a number of initiatives promoting competition should be undertaken with respect to interconnection, numbering, spectrum management, licensing, interoperability.

Interconnection

Interconnection is important in a competitive market because it secures communication from any point of a network to any other point of another network and safeguards the right of all newcomers to be connected to the existing networks. Networks should be interconnected with transparent and non-discriminatory access to scarce resources. In the European Union, free access is defined by the concept of open network provision, which seeks to ensure open access to public telecommunication networks and services, in accordance with harmonised conditions. Harmonisation regards network interfaces, conditions of use and the principles of cost-oriented billing, and is based on the principles of objectivity and non-discrimination.

Unbundled Access to Local Loop

The unbundling of the local loop enables legally entitled organizations (telecommunications providers) to use the access network of the incumbent to provide services. All the national Balkan PTTs, developed most of their wire access network, which requires heavy investment, under the protection of a monopoly status. The possibility of other organizations to provide telecommunications services via the access networks of national telecommunications organizations should be secured by the appropriate legislation measures. The unbundling of the local loop enables competition and accelerates the application of new technologies permitting the provision of new services with the immediate result that citizens enjoy higher quality services at accessible and competitive prices.

Numbering and Addressing.

The development of the communications infrastructure shall lead to the need for the preparation and implementation of a National Numbering Plan (NNP) and the implementation of a number management framework. The National Numbering Plan should address the method, the timetable and the goals on a national level.

The most important features of a comprehensive Numbering Plan should include are:

- Timetable of implementation (Initial period, parallel operation period, date of conclusion)
- Portability of telephone numbers
- Carrier pre-selection

Carrier pre-selection will allow the customer to pre-select the provider via which he/she will initiate a certain type of call without having to key in the corresponding carrier selection code. The portability of a number allows the citizen to retain his/her number when changing network providers and thus encourages citizen competition. The process of convergence introduces also the similar issue of addressing. In the context of electronic transactions, this issue is associated with the assignment and management of domain names, and leads to authentication and encoding issues. Numbering requires co-operation on a European scale, while addressing has an international dimension due to the universal character of Internet.

Spectrum management

Spectrum and radio frequencies are a scarce national resource and are of special importance for the communication infrastructure especially in wireless (earth and satellite) communications. In many countries spectrum use capability is granted for a fixed or periodic fee. For ensuring pan-European operation, common frequency bands have been defined for all member states for mobile and satellite communication systems.

Licensing

Licensing specifies the technical conditions (essential requirements) and public interest conditions that an entity requesting a licence for service provision should meet. As infrastructures grow and the environment matures, entry conditions should be simplified. The Telecommunications Regulatory Authority should work towards this end and actively intervene in this area, monitoring the activity of telecommunications providers and operators.

Interoperability.

The interoperability of services and the adoption of standards by providers, both on a national and on an international level, maximise networking possibilities. Consensus should be encouraged in the definition of the appropriate standards, and eSEE countries should participate in discussions in the framework of European and international initiatives in this direction. At the same time, private sector activities as well as intellectual property rights on proprietary standards need to be protected in order to encourage innovation and development.

The basic principles governing the development of the national communications infrastructure should be free access to networks and information and the promotion and protection of competition.

5.7 The liberalisation of telecommunications

5.7.1 Positive consequences

The result of the liberalisation of telecommunications on an international scale is the provision of better telecommunication services at lower prices for enterprises and the citizens. At the same time, given the large share of the telecommunications sector in national economies, liberalisation will also lead to higher investments, productivity and employment in many other sectors. With respect to employment in particular, international comparisons show that more jobs have been created in countries with liberalised telecoms environments than in those with monopolistic environments. The telecommunications sector has the much-needed dynamism by the economies of the SEE region and should be exploited to the maximum of its capabilities.

Consequences of freeing the telecommunications market

Expert analysis and international and European experience concur in predicting that the impact of the full freeing of telecommunications services in SEE countries will result in:

- a broadening of the package of services offered to corporate and private users, particularly with regard to integrated broadband services
- higher quality telecommunications services at lower cost, due to competition
- the operation of the telecommunications market as the engine for development in other sectors of the economy and of the society, driving up investment, productivity and employment
- increased employment in the telecommunication and IT sectors
- increased user choice with regard to the content and the services offered,
- entry into the market of new telecommunications carriers and in general new providers of value added services, accompanied by an increase in investments and in inflows of foreign capital
- higher rates of absorption of new informatics and telecommunications technologies & services
- changes in the structure of the telecommunications market and of the information services market as a result the new business model that will emerge from the national and/or supranational alliances among telecommunication companies and enterprises of other sectors

5.7.2 Completing the institutional framework

Completing the institutional framework by incorporating relevant EU Directives into National Law and introducing the necessary additional legislative and regulatory acts should be a government priority. The completed institutional framework will encourage the development of telecommunications as well as new investment activities in alternative networks, other infrastructures and the provision of new or conventional services. A clear formulation and supervision of competition rules and implementation

measures is necessary. This creates a climate of confidence in the market as regards the intentions of the policy-maker, and the rights and obligations of the organisations and companies involved in the new telecoms environment. The course towards full liberalisation requires the presence and operation of an independent and strong regulatory authority that supervises the policy mapped by the Ministry of Communications and the enforcement of its effective application. In this context, the government should support the independence of the National Regulator so as to promote its effective operation.

The role of the National Telecommunications Regulatory Authority

Because of the increased need for the State to constitute a reliable partner for enterprises active in the telecommunications sector the Regulatory Authority should be assigned important decision-making responsibilities in the areas of licensing and verification of compliance with the law, as well as advisory responsibilities in a whole series of cases. The National Regulatory Authority should also intervene to resolve disputes, whether the parties involved are enterprises, users or the State, and serve as an arbitration tribunal on the basis of the relevant arbitration clause. Its role should be substantially strengthened, and include both regulatory and monitories responsibilities, the chief of which are:

- regulating all matters relating to general and special licences (granting, renewing, modifying, revoking, suspending, transferring and sharing) and fixing the terms of competitions (where required) organized for the awarding of special licences
- issuing billing regulations and establishing costing principles for access to and use of the local loop, leased lines and connections
- assigning numbers and domain names
- granting licenses for the manufacture of antennas, and assigning isolated radio frequencies or bands
- drafting the National Numbering Plan and the National Radio Communications Regulations, as well as the conditions for Open Network Provision and any probable limitations to network access caused by substantive requirements
- drawing up the list of organizations with substantial market force, and of those that are obliged to provide leased telephone lines
- implementation of Universal Service, including matters relating to financing
- the possibility of issuing regulatory or individual acts; the National Regulatory Authority should also be required to advise the legislature on proposed legislative measures
- checking contracts for connections, provision of voice telephony and mobile communications services, and use and application of the National Regulation for the Allocation of Frequency Bands
- arbitrating differences between telecommunications organizations or between telecommunications organizations and the state, users and private individuals
- representing the country on European and/or international organizations and committees in areas relating to its sphere of responsibility

Market liberalisation and competition require also the correction of probable historic telecommunication tariff imbalances as well as transparency in billing. Tariff re-balancing may involve reductions in international and long-distance rates and an increase of local rates or vice-versa. The tariff policy should be cost-oriented. With the assistance of cost

accounting systems, the operator will be in the position to provide information and justify the costing base of its tariff policy.

5.7.3 Policy priorities

For the completion of the institutional framework, policy priorities should be:

- Supervision of network access based on the open network provision framework adapted to the status of gradually liberalised telecommunications, in order to ensure that there is no abuse of Incumbent's Operator monopoly position
- Supervision of equitable treatment of all telecommunication service providers by the public administration and publicly owned firms.
- Provisions on interconnection based on transparency, objectivity, non-discrimination and creation of multiple nodes all over the country. Interconnection billing should be cost-oriented, taking international practice into consideration.
- Implementation of a National Numbering Plan, as well as of a new framework regarding the management of domain names.
- Clarification of the terms for the installation of public services for data (Internet) and installation of public terminals, etc. in public spaces.

5.7.4 Alternative networks

Finally, in the framework of telecom liberalisation, the medium-term operation of alternative networks is of particular importance. Alternative networks are all telecommunication infrastructures except the network of the public telecom operator with monopoly rights. The development of alternative networks will promote the adaptation to the international competitive environment, while enabling certain public utilities to diversify their strategy and target new business activities with benefits for the consumer as a result of the strengthening of competition. The Telecommunication Laws and the liberalization of the market should allow the development of such alternative networks without the use of excessive public funding, on the basis of appropriate business plans and private sector profitability criteria.

In the context of telecoms liberalisation, the SEE countries should give priority to the completion of the institutional and regulatory framework and to the promotion and supervision of a competitive market environment.

Provision of universal service

Universal service should be an integral part of the policy for regional development and the participation of all citizens in the Information Society where access to information is a right (e-inclusion).

5.7.5 The evolving content of universal service

Universal service has a dual role: social (as a means for avoiding exclusion) and developmental (assisting the development process). It is defined as a set of services of specified quality, available to all users irrespective of geographical location or other restrictive factors (e.g. individuals with special needs) and, in the light of the special national circumstances as applicable, economically affordable.

The content of universal service is dynamically defined as infrastructures continuously evolve. In this light, both the EU and international organisations such as the OECD accord particular importance to the content and the dynamic meaning of universal service and maintain that it is the first step towards the development of the Information Society. The Incumbent State Operator offered universal service and its content was focused mainly on voice telephony through a fixed connection, allowing also low speed fax and data transmission. Operator and emergency services, directory assistance, public phones were included; such services are to be available for people with special needs as well. With the evolution of technology and the market and with the change in user requirements, universal service may be modified in order to comprise:

- subsidising telecom services for economically weaker social groups
- the possibility of connecting schools, libraries, health centres and Hospitals to the Internet at special prices.

In many countries particular emphasis is given on the costing and financing of universal service in a liberalised market, since its development is expected to influence significantly basic activities such as education and/or vocational training. As a basic principle, it is necessary to provide information relevant to cost, prices, and quality. The costing of universal service necessitates the accurate and objective determination of the cost of services that are not economically viable, given that the manner of its financing will be determined on the basis of such calculations.

The cost is calculated on the basis of net cost, i.e. as the difference between the operating cost of an organisation with universal service obligations and the relevant operation without this obligation. The calculation should be made separately for each service, geographical area, special groups and individuals with special needs, and be based on procedures ensuring objectivity, transparency, non-discrimination and proportionality. Those liable to contribute to the cost of universal service are the entities providing public telecommunication networks and/or publicly available voice telephony.

Under the EU directive on open network provision, two ways of financing universal service are proposed: the establishment of an independent universal service fund on a national level and the payment of an additional fee by those connected to the network. In both cases, a prerequisite is the certification of cost by the National Regulatory Authority. In the case of the establishment of an independent fund, this is managed by an independent entity responsible for collecting the contributions by the liable parties and making the relevant payments.

5.7.6 Conclusions

This chapter aimed to offer an overview of the major issues for the Telecom sector and to suggest the necessary strategy and to set common priorities for the much-needed reforms[6].

The focus also has been to converge to the EU acquis. However it should be noted that, depending on the country, the direct transfer of the European legislation is not always the most suitable solution in the short term. The legislation process is too slow (average five years) and it might become already obsolete by technological advances. The EU

[6] The National Strategy for Telecommunication sector is currently in the process of development.

legislator has in mind developed economies and markets so the priorities are quite different with countries in transition process as Serbia. A creation of a homogeneous regional market between the countries of the region will attract FDI to the sector for the benefit of all, and for Serbia as well.

The changing environment is placing all actors of the ICT sector under pressure to implement radical changes in their working procedures in order to improve competitiveness and respond to the market demands for the sake of their own survival in an increasingly competitive marketplace. Nearly everything in addition to legal and regulatory issues in the organization of the sector should be "re-thought" including its strategy, management style, organizational structure, working procedures, organizational culture, performance and institutional image, as well as HRM/D policies and systems in order to put them in-line with the new demands of a Global Information Economy.

Nevertheless the above transformation is not a challenge to be faced exclusively by the government and the regulators. This transformation process produces changes at all levels, which have to be assimilated within very short time frames. Some of the demands for the human resources could be summarized as follows:

- Acquirement of new competencies
- Absorption of more information
- Handling of new tasks
- Improvement of their performance
- Modification of their values and attitudes
- Change of their work habits

It is the human dimension that shall be fundamental in any change of the framework of the ICT sector. People should:

- Understand the changes
- Accept the changes
- Be able to implement them

So, alongside legal and regulatory changes, people too must change. HR-related challenges in a competitive and demanding environment are complex and laborious to implement. Government should take advantage of regional initiatives such as eSEEurope, ITU Center of Excellence, INA Southeast Europe Telecommunication Academy (SETA) to attract and involve the greatest number possible of potential content/expertise providers, with a view to generate high-quality training and development products as well as benchmarks, case studies and models, in such a way that it would help stakeholders to build appropriate solutions.

6. E-GOVERNMENT

6.1. Introduction

The reform and modernization of public administration based on wide use of information-communication technology (ICT) represents one of the key elements of the overall transition of Serbia into a modern information society. ICT has the great potential to transform the government and the services it provides to the public. Modern information systems enhance the quality and improve the efficiency, transparency, accountability and effectiveness of the government. The modern ICT infrastructure allows information to flow seamlessly across the public sector and can provide citizens and business with better access to government services and at a lower cost. Speeding up administrative procedures and reducing business operation costs creates a better business ambient for further economic development. The possibility of all citizens being able to electronically access public services, participate in decision-making processes and oversee government activities contributes to the wider democratization and improvement of the government-citizen relationship.

To exploit this potential, the government therefore has to adopt ICT means and ICT based methods in all branches and levels of the public sector. Only such ICT-enabled public administration oriented toward citizens and businesses, commonly called as e-Government, provides an environment that can adequately address needs and challenges of the future information society and knowledge based economy.

However, weak institutional, legal and technological infrastructure, shortage of financial and human resources, bureaucratic resistance to change, as well as lack of leadership and strategic thinking constitute the main obstacles against the effective introduction of e-Government in Serbia.

6.2. Development Goals

The development of e-Government is not a goal in itself, but in function of more general economic and socio-political goals:

- Modernization of public administration;
- Development of national economy;
- Wider participation and engagement of citizens in democratic processes.

6.2.1. Modernization of public administration

The modernization of public administration implies the radical change of the traditional way how administrative processes within the government are performed. This change means that citizens are not forced any more to be physically present and go from one government department to another, as it is usual today, wasting their time and money collecting required documents in order to submit a request. Instead, due to ICT which enables complete automation of administrative procedures and integration of geographically distributed departments, citizens can satisfy their needs posting requests from the single place (i.e. e-Government portal), regardless the number of different departments being involved in processing of the request in the background. Additionally, citizens can get at any moment information about the current processing stage of their

requests. Thus, e-Government provides more efficient, transparent and accountable public services tailored to the needs of the citizens and business.

E-Government also fosters reorganization, simplification and standardization of administrative procedures. Consequently, due to standardized and transparent administrative procedures, it can greatly contribute to the combat against corruption. E-Government can also be amply employed to improve the administration within the government – coordination, planning, execution and control of government acts, administrative processes, etc. – as well as government transactions with the private sector. In other words, e-Government is a great enabler and facilitator of the public administration reform.

6.2.2. Development of national economy

In development countries, e-Government serves as a powerful tool to promote sustainable economic development. Integrated with other relevant national economic strategies, e-Government can be employed to:

- Create a better business ambient for further economic development by reducing business operation costs;
- Promote the economic activities and advantages of national economy on the internet;
- Provide the ICT infrastructure to attract and retain businesses;
- Promote the take up of e-business among businesses, so improving their ability to compete in a wider market;
- Enhance the skills and employability of the population;
- Support development and strengthening of the national ICT sector through its engagement in e-Government development activities.

6.2.3. Wider participation and engagement of citizens in democratic processes

E-Government is not only about providing services – it is also about encouraging and engaging people in shaping the future of their villages, towns and regions. Using internet based electronic services citizens can talk to each other and to government about issues that matter, participate in political debates and planning in many ways, ranging from public access to government information and meetings, through consultation and polling, discussion forums and citizens' panels, to electronic voting.

6.3. The Concept - Vision

The concept of e-Government envisions interactive electronic services tailored to the needs of citizens and businesses, which are integrated across all levels of the public sector. This concept is illustrated on the following diagram:

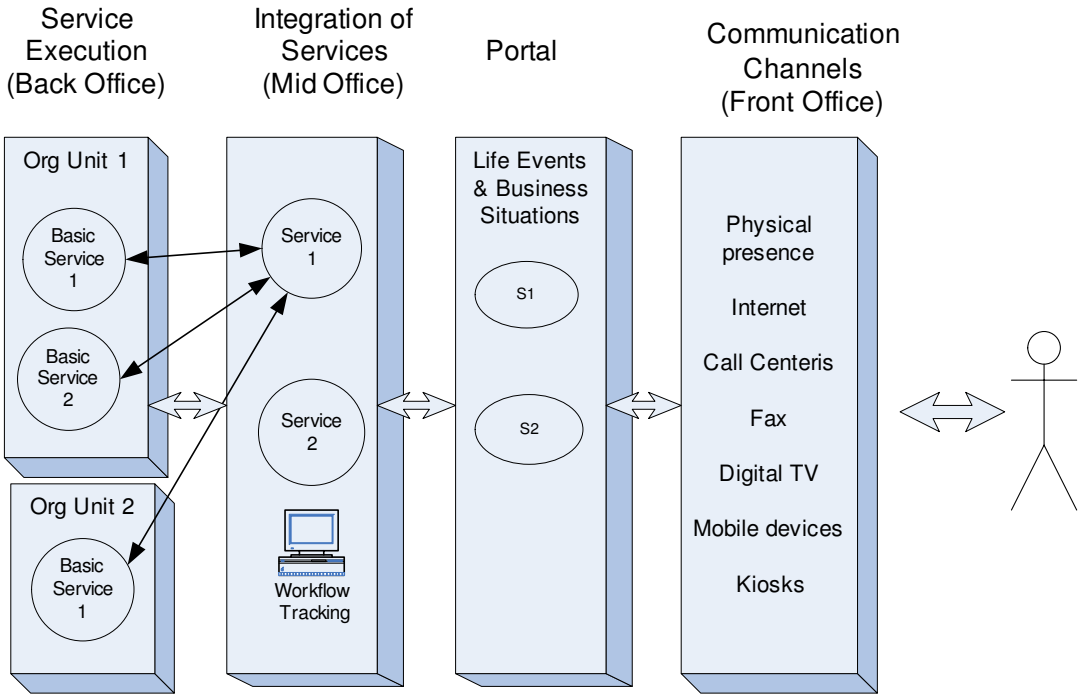

Figure 1. The e-Government concept

The main characteristics of the e-Government concept are:

- There are several communication channels providing access to public services, which are chosen according to the convenience of citizens and businesses.
- Public services are organized according to the needs of their users, i.e. according to life and business situations of citizens and businesses, not according to the internal organization of government departments.
- Functions provided by government departments are fully integrated, instead of being fragmented and representing isolated islands.
- User requests accepted by the font office are transparently processed in the background regardless the number of different governmental units involved in the processing. Services of one department can rely on and invoke services of other departments.
- Citizens and businesses are required minimal documentation in order to submit requests to satisfy their needs. All other needed information, if kept by some government organization, is obtained through inter-governmental communication using integrated services.

The presented E-Government concept is implemented gradually progressing through different levels of development. From the aspect of quality of services offered to the public, there can be identified three such levels:

Only online information available. Users are provided only with (static) information on the Web without possibility of having an electronic interaction with the government.

Communication/Interaction enabled. Citizens are enabled to electronically communicate with the government, e.g. to exchange e-mails or use simple applications for bilateral communication.

Transactions/integrated services implemented. Complex and specialized transactions with a multi-stage value chain between different government organizations with the aim of performing an individual-related service, such as processing a citizen's request, are fully implemented.

These identified levels can be used to plan the progress in bringing services and compare achievements in this regard among different organizations within the public sector.

6. 4. Implementation Process of E-Government

This vision of e-Government presented above is quite far from the today's situation in Serbian public administration and represents a very complex endeavour to make it real and introduced in everyday practice. This section explains fundamentals of e-Government implementation.

6.4.1. Implementation principles

E-Government should be implemented respecting the following basic principles:

- **Access for all**. Public services must be available to all citizens. The main prerequisite for this is a cheap and fast access to Internet.
- **Prevention of digital divide**. Citizens with low income and poor technical knowledge should not be discriminated, i.e. the digital divide among different social layers must be avoided.
- **Security and privacy protection**. Public services must be safe and must protect privacy of citizens.
- **Open system**. E-Government will be implemented according to the principles of open systems, based on ICT solution from different providers which are open and interoperable.
- **Coherence and functional unity.** E-Government represents a very complex but integral information system functioning as one coherent system, where unity and interoperability among its heterogeneous parts is achieved through standardization and coordination of development.
- **Autonomy in development**. Each government body or public organization can autonomously develop and manage its own subsystem according to previously agreed e-Government standards and national development plans.
- **Flexible and modern ICT solutions**. Implemented ICT solution will be based on the latest methodological and technological achievements enabling productive development and providing flexibility to future organizational and technological changes.
- **Reliance on national ICT sector and academic/research community**. To provide a chance for growth of the national ICT sector and to foster national academic/research community, development of e-Government will be mainly based on national ICT companies and academic and research institutions.

6.4.2. E-Government framework

The realization of the goals and vision of e-Government is a very complex process which requires many activities to be done. To manage this complexity, the following framework identifies key e-Government components enabling to better structure and organize e-Government development activities.

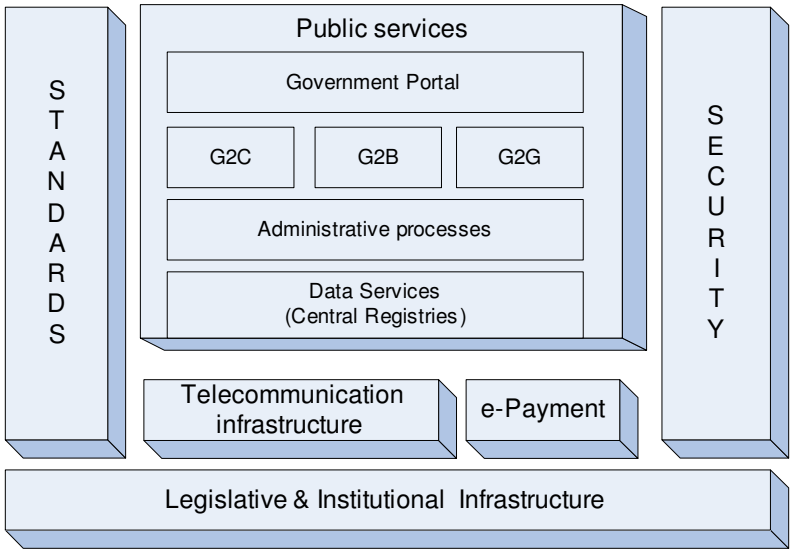

Figure 2. E-Government framework

The following key e-Government components are needed to be developed:

Electronic public services. Public services have to be rationalized, organized according to the needs of users, automated and made electronically available. The following user-oriented group of services should be developed:

- State government portal, with all important information about public administration and links to sub-portals.
- Citizens: Government-to-Citizens (G2C) services, easy to find, easy to use, one-stop points-of-service that make it easy for citizens to access high-quality government services.
- Businesses: Government-to-Business (G2B) services that reduce government's burden on businesses by streamlining administrative procedures, eliminating redundant collection of data and better leveraging E-business technologies for communication.
- Intergovernmental: Government-to-Government (G2G) services that enable both central and local government bodies to participate as full partners in providing public services to the public.
- Intra-governmental: By automating internal administrative procedures and providing access to common databases and central registries, intra-governmental services represent the basis for all other electronic services.

Telecommunication infrastructure. Modern and liberalized digital telecommunication infrastructure enabling citizens, business and government organizations fast and cheep access to electronic public services is the communication basis for e-Government. The implementation of this infrastructure is thus vital for the goals of e-Government, especially in remote and undeveloped regions.

E-payment. Electronic public services spanning across diverse government organizations require electronic methods of payment. Such payment methods have to be defined and promoted. However, e-Government should keep supporting traditional methods of payment in order to enable gradual transition and prevent digital divide among citizens.

Security. Security of transactions and protection of information play a significant role in successful realization of e-Government. There are several aspects of the security, but particularly important is to enable mutual trust to support widespread use of electronic interactions between the public and government and across government by providing common solutions to establish 'identity' of participants in electronic transactions.

Standards. Standards are crucial for the successful development and integration of government services and information. Standards have twofold purpose: (1) to achieve interoperability between heterogeneous ICT solutions deployed in different areas of e-Government and (2) to enable coordination of development activities of e-Government.

Legislative infrastructures. E-Government requires a new legal framework which would adequately regulate wide use of electronic services and the ICT in public administration and in inter-relations of the government with citizens and businesses. First steps towards defining the legal framework for have been made by the Electronic Signature Act, but the legal and regulatory framework has to be developed much further to eventually embrace all e-Government aspects.

Institutional infrastructure. Successful development of e-Government requires an effective governance structure that would plan, coordinate, carry out and evaluate the adopted e-Government strategy.

6.4.3. Progress indicators

An assessment of the e-Government strategy's performance should be carried out with the use of a set of indicators (and of a methodology for their systematic collection and analysis) throughout its execution. Given the great scope and the nature of the e-Government, multiple indicators should be employed and monitored and detailed studies for the selection and gauging of these indicators should be carried out. Nonetheless, some general methodological guidelines in regards to this are already clear:

- At least two levels of indicators are necessary: an initial, more general level, that measures variables directly related with the key components proposed, which will emphasize an economic or social aspect; and a second, more specific, level, which measures variables directly related to the concrete actions that the strategy will propose and that will have, therefore, a more technical and sectional nature;

- The more specific level involves various indicators directly related with ICT, reflecting both the production as well as the consumption of public services and goods in the areas of computers and components, telecommunications, etc.

6.4.4. Critical factors

The actions proposed by the e-Government strategy should addresses, among other things, factors which are critical for the realization of the e-Government vision. The following critical factors are identified:

Political commitment - crucial to put e-Government as one of the top national priorities and mobilise available resources.
Leadership and strategic thinking - needed to adopt and implement the e-Government vision, especially to overcome and reconcile particular interests of different stakeholders.
Human resources – adequately trained civil service servants for use of ICT and sufficient number of ICT professionals employed within the public sector is essential.
Funding - necessary to enable sustainable development.
Resistance to changes - many would perceive e-Government as a disturbing factor and threat to their current positions.
Participation of citizens and businesses – poor ICT educate of population and lack of trust in electronic services can be prevent

6.4.5. Strategic partnership of key actors

The strategic partnership is needed among the key actors:

- Central government
- Local self-government
- Civil society (Non-government and civil organizations)
- Business
- Academic/research community
- ICT sector

The strategic partnership means that there is a common agreement of all actors on the goals and vision of e-Government and that they will actively participate in development activities.

6.5. Key Areas of Actions

Activities needed to be done can be organized along three main areas of actions:

- Planning and organizing e-Government development
- Creation of an adequate environment for e-Government development
- Development of public services and content of e-Government

6.5.1 Planning and organizing e-Government development

As the experience from other countries suggests, successful building and effective introduction of E-government is a big challenge, which requires a good organizational

infrastructure, careful planning, effective execution mechanisms and well coordination of all stakeholders.

6.5.1.1. Establishing institutional framework

The creation of proper organizational structures is a fundamental action for the introduction of e-Government. Creation of an institutional framework should follow the principle of decentralised coordinated development. This type of development assumes that each organizational unit is responsible for its own development, while unity of the whole e-Government as a system is achieved by coordination through commonly agreed development plans and adopted standards.

The exiting outmoded fragmented administrative structure should be replaced by the model of cooperative administration, where there is distribution and clearly defined jurisdiction between different departments over the following six basic organizational functions:

- Policy/strategy adoption
- Coordination
- Implementation
- Support
- Audit/Quality assurance
- Security/ data protection

As it is already explained in the Chapter 3, it is foreseen that the e-Government institutional framework is merged into a wider one responsible for the Information Society in general.

6.5.1.2. Planning of e-Government development

Initially, taking into account this strategic document, a detailed strategic long-term plan for e-Government development covering the next 5-year timeframe should be created. Starting from analysis of existing situation in all government sectors and taking into consideration the goals and vision of e-Government, the objective of this action is to create logical and physical architecture of the integral government information system and to give detailed resource and temporal annual plans of development activities together with budget requests. Based on this development plan, all government departments and public sector organizations will adopt their own more detailed development plans.

These global and local development plans will be regularly monitored, evaluated and accordingly modified by the established institutional mechanisms.

6.5.1.3. Development of e-Government Standards

The main objective of activities in this area is to define:

- An interoperability framework which sets out the government's technical policies and specifications for achieving interoperability across the public sector,
- Standards for development processes (i.e. development methodology) covering the whole life cycle of key e-Government components.

- Progress indicators measuring e-Government development.

There should be also defined a standard procedure how to adopt new and modify existing standards. The standards adopted in this way should be compulsory for all central and local government organizations and business partners engaged in e-Government development.

6.5.2. Creation of environment for e-Gov development

6.5.2.1. Development of relevant e-Gov legislation

The objective is to provide legal framework, which will address legal issues regarding electronic public services and wide use of ICT in the public sector. This activity should result in a proposal for adoption of the Electronic Government Act. The legislation to be created will adapt European legislation.

6.5.2.2. Building ICT infrastructure

The main objective of activities in this area is to:

- provide cheap and fast internet connections for citizens and businesses
- build modern digital telecommunication network needed for realization of integrated public and inter-government services

Special attention should be paid to rural and remote regions so that access is provided for all citizens. The government must build appropriate mechanisms, which will ensure fulfilment of this requirement in situation of liberal and privatized telecom market.

6.5.2.3. Building security infrastructure

The main objective of activities in the area of security infrastructure is to o define and build mechanisms, such as PKI, that would provide privacy protection of citizens, make electronic transaction safe and rise trust in e-Government. The solutions to be developed should follow international standards in this area.

6.5.2.4. E-Payment

The main objective of activities in this area is to define, introduce and regulate payment methods, which would enable electronic services that are integrated across the public sector. The concept of a single service tax paid by citizens and distributed among participating organizations providing services should be defined. Activities in this area are in strong correlation with activities in the area of e-Banking.

6.5.2.5. Building human capacities

The main objective of activities in this area is to:

- Enhance ICT skills of civil service servants.
- Train ICT experts employed within the public administration how to use and harness the latest ICT achievements.

- Make conditions to enable recruitment of best available ICT experts on the labour market to work for the government.

6.5.2.6. Promotion of e-Government

The main objective of activities in this area is to raise awareness and understanding of e-Government in order to provide wider participation of citizens and businesses.

These activities will be carried out by media and using other means by appropriate government ministries at the global level.

6.5.3. Delivery of electronic public services

6.5.3.1. Reengineering and standardization of administrative procedures

The main objective of activities in this area is to:

- Define, reorganize (rationalize) and standardize administrative procedures through which citizens and businesses satisfy their needs and exercise their rights at all levels of the public sector. This is important for their simplification and automation, but equally, if not even more, for combat against corruption within the public administration. Only clearly defined and standardized procedures enable their transparency.
- Establish an institutional mechanism for continual and sustainable improvement of administrative procedures.

6.5.3.2. Development of common data services and infrastructure components

The main objective of activities in this area is to build common software infrastructure needed for the implementation of electronic public services. Services providing access to central registries and other common databases should be a priority. They will be developed according to the defined interoperability standards.

6.5.3.3. Development of public G2C and G2B services

All government and public sector organizations should achieve the development level of available online information. Other development levels will be developed gradually according to the defined and adopted global and local e-Government development plans.

As one of first activities in this area, some selected fairly complex services which require participation of both central and local government institutions should be developed through a pilot project. The main objective of this activity is to prove the e-Government concept and establish “best practice” experience.

Both central and local E-Government development plans should put the priority on the following 20 services (12 for Citizens and 8 for Business):

G2C services:

- Income taxes (declaration, notification of assessment)

- Job Search services by labour offices
- Social security benefits
- Personal Documents (passport and driving licence)
- Car registration (new, used and imported cars)
- Application for building/planning permission
- Declaration to the police (e.g. in case of theft)
- Public libraries (availability of catalogues and search tools)
- Certificates (birth, marriage): request and delivery
- Enrolment in higher education/university
- Announcement of moving (change of address)
- Health-related services (interactive advice on the availability of services in different hospitals; appointments for hospitals)

G2B services:

- Social contributions for employees
- Corporation tax: declaration, notification
- VAT: declaration, notification
- Registration of a new company
- Submission of data to statistical offices
- Customs declarations
- Environment-related permits (incl. reporting)
- Public procurement

These services are widely recognized as most important and are used by EU (IDA) to measure the progress of particular countries in the e-Government area.

Special care should be taken that government services are made available not only in the major urban areas, but that they are also accessible in rural areas and remote places. The realization of the e-Government concept should put priority on local government services.

7. E-EDUCATION

7.1. Introduction

Information society represents a challenge and chance for developing countries like Serbia. Instead of natural resources or industrial capacities, knowledge is the vital resource in the information society and generation of new knowledge represents the basis for the wealth in this post-industrial society. Hence, the term knowledge based economy is coined. Generation of new knowledge undoubtedly depends on human capacities, i.e. on their ability for innovative thinking and skills to effectively use modern information technologies, which represent technological underpinning of the information society. Thus, making its population and economy equipped with this ability is a great chance for Serbia to join developed countries and actively participate in global economic activities while preserving national economic sovereignty.

Education together with scientific research & development (R&D) play the major role in turning this chance into a reality. Education must provide citizens with basic ICT skills and prepare them to become equal members of the information society. Education also should provide every citizen with more than basic computer literacy and traditional knowledge. In addition to introduction of new educational curricula better suiting needs of the information society, new forms of education based on continual and long-life learning are needed. It is the only way how individuals can adjust to permanent changes in knowledge based economy in order to enhance their chances for employment.

R&D is vital for the competitiveness of the economy. Relied on education and cultural and historical heritage, R&D is the main source of knowledge needed for the creation of new goods and services offered to the global market.

7.2. Goals

The goals of the e-Education initiative are the following:

7.2.1 Making citizens computer literate and equal members of information society

The goal aims at education of wide population about ICT, i.e. ensuring that citizens have basic but critical ICT skills. As wide use of ICT and emerging public electronic services change many areas of our lives, such skills will become necessary for performing everyday activities. Only computer literate citizens would become equal members of information society. The fulfilment of this goal is important for the prevention of digital divide in society.

7.2.2. Building educational system adapted to the needs of information society

Information society requires adequately educated and skilled workforce enabled to work in highly competitive environment of the global economy. Such workforce can be created only by proper education. Educational system therefore should be adapted to provide efficient education at all levels promoting innovative thinking and introducing life-long learning. As wide use of ICT becomes essential in many vocational areas, knowledge of how to make full and effective use of ICT should be integral part of modern educational programmes.

7.2.3. Fostering research & development

Creation of new goods and services through research & development (R&D) is the only way to provide economic growth and generate more workplaces. Hence, R&D should be fostered by strengthening R&D human capacity, building adequate R&D infrastructure and further promoting collaboration between R&D and industry.

7.2.4 Providing access to information about cultural and historical heritage

Preservation and dissemination of cultural and historic heritage is important for any society in order to provide better understanding and tolerance among different nations. In economical terms, cultural and historic heritage helps to establish national trademarks and promote advantages of national goods and services offered to the global market.

7.3. Vision

The information society and wide use of ICT in all aspects of or lives require rethinking and necessary changes of the existing role that traditional educational and R&D systems have. This new role is characterised by the following facts:

Education and scientific R&D are vital in the information society:

- The information society requires from all a higher level of knowledge and skills, which can be provided only through proper education.
- ICT-related skills are crucial for the competitiveness of the national economy and for increased job opportunities and employment.
- The key issue is to apply ICT in the workplace in ways that raise efficiency, improve the quality of work and provide better jobs.

A new concept of education system is needed:

- Introduction of a new model of education based on innovative thinking and life-long learning is better suited for the needs of the information society.
- Rapid technological changes making once learned knowledge obsolete requires modern and efficient educational system.

A new concept of R&D system is needed:

- R&D is the main generator of new knowledge
- R&D is in a service of knowledge based economy
- Innovative and efficient R&D is required.
- National R&D is part of unique EU and international open research space
- Cooperation with research institutions for abroad
- Participation in EU and other internationally funded research projects.

ICT in education and R&D is needed:

- ICT can be used to support efficient education and R&D
- ICT in education can be used to introduce the concepts of e-Learning methods and open distance learning
- ICT in R&D

Social aspects of e-Education should not be neglected:

- Digital divide should be prevented
- Rural, income, education, age and gender gaps must be overcome.
- Special learning needs of particular social groups should be adequately addressed.

7.4. Areas of action

To adequately address the challenges and exploit the opportunities, the following action areas should be covered:

- E-Inclusion
- Adaptation of educational curricula to needs of the information society
- Strengthening ICT capacities for modern education and scientific research
- Supporting innovative research & development
- Technology enhanced education and culture

The modernization of educational and R&D system is far-reaching and rather complex process which must be therefore carefully designed. There are several documents already drafted which properly address these issues proposed by the Ministry of Education and Sport as well as the Ministry of Science and Environmental Protection. Activities in this area should be should be synchronised with this and other strategic documents related to the reform of the educational systems and innovative research.

7.4.1. E-Inclusion

This area is related to activities aimed at preparing entire population for information society through education for basic computer literacy and by raising general awareness of importance of information society.

Younger generations should be covered in this regard by the regular educational process. The minimum level of computer literacy should be provided at the level of primary and secondary schools.

Older generations should be included in this educational process though a set of specially designed courses. They will be organized at the level of local communities in cooperation with the private sector. Courses covering basic computer literacy should be free of charge. Such courses should be financially supported by both local and central governments and appropriate government agencies, such as the National Employment Agency.

The standard methodology for education and national computer literacy standards, compatible with corresponding EU standards (such as European Computing Driving Licence – ECDL), will be defined. Standard methodology will assume external examination in order to ensure the quality of the provided education.

7.4.2. Introduction of post-education and long-life learning concepts

Post-education and long-life learning should become a part of normal educational process, where individuals after getting their degrees can improve existing knowledge and learn to exploit latest technological achievements.

Such type of education will be offered by both state and private educational institutions at all educational levels. This will be done through specially defined educational programmes tailored to the needs of particular professions and according to the current situations on the labour market.

This process will be also supported by a network of public and school libraries, where electronic publications and other digitalized library materials will be available to the public through the internet. Such electronic access to the relevant information can significantly improve the quality of the life of citizens and enhance availability of rare publications or expensive teaching materials. It also redefines and affirms the role of libraries which become important points of learning and enhancing knowledge.

7.4.3. Adaptation of educational curricula to needs of the information society

The existing educational curricula at all levels should be adapted to adequately meet needs of the information society. This process should be part of the overall reform of elementary and secondary schools and transformation of higher education according to the Bologna declaration.

In addition to introduction of the new contemporary topics, especially ICT related ones, into curricula, this process also includes introduction of new teaching methods, better assessment methods and quality control mechanisms.

This modernisation of educational systems should adopt existing international and EU standards defined in this area. For example, the higher education should fully adopt the European Credits Transfer System (ECTS).

7.4.4. Building human capacities for teaching ICT skills

Lack of skilled teachers able to deliver modernized curricula using modern teaching methods could endanger the whole process of modernization of the educational system. Therefore, special attention should be paid to the education and continual improvement of teachers' skills at all level of education.

This type of education should be done according to special developed programmes and corresponding quality standards. All teachers should have an advanced level of computer literacy, including knowledge to effectively use e-Learning systems and other ICT methods in teaching. ICT teachers should be professionals graduated at the appropriate technical or science faculty.

7.4.5. Strengthening capacities for modern education and scientific research

All primary and secondary schools, universities, research institutes, museums, libraries, student halls should have broadband connection to the internet.

The state should provide an appropriate broadband network for such purposes, such as the existing academic network. Appropriate financial model will be also developed in order to enable educational and research institutions affordable access to the internet.

7.4.6. Supporting innovative research & development

There should be a set of mechanisms and instruments provided by the government in order to foster innovative R&D. Appropriate funds supporting scientific and technological innovations must be established. Existing programmes fostering innovations and collaboration between R&D institutions and industry should be extended. Instruments such as technology transfer centres, scientific parks, incubators, innovative centres, etc. should be supported.

Cooperation with academic and research institutions from abroad and participation in international research projects is very significant for strengthening of national research capacities, improvement of quality of research, enhancement of knowledge and skills of researchers and prevention of "brain drain". It is particularly important participation in EU funded research projects enabling national research institution to become part of the unique European research space.

Major national development initiatives, such as development of e-Government, should be mostly entrusted to national companies and academic and research institutions enabling them to gain proficiency and experiences needed for the global competition.

7.4.7. Technology enhanced education and culture

Special educational programmes should be developed in order to foster

- Open and distance learning
- Usage of e-Learning methods and tools

By using modern ICT methods and corresponding infrastructure, cultural and historical heritage should be transformed in digital form, preserved and made publicly available through:

- Digitalization of paper based content
- Dissemination and sharing of information publicly by network of national public libraries, museums, and other cultural institutions

8. E-HEALTH

8.1. Introduction

E-health refers to the use of modern ICTs to meet the needs of citizens, patients, healthcare professionals, healthcare providers, as well as policy makers. As one of the standard ICT applications in the framework of a national strategy for information society development, e-health also supports sustainable development and brings benefits to all aspects of life of our citizens.

Health care is the one sector that all members of a society are equally interested in, meaning that improving it would benefit all citizens alike, because each and every one of them has the legitimate right to most suitable medical treatments, at the lowest cost possible and with the least inconvenience.

The application of information and communication technologies in medicine has improved the efficiency, results, quality of medical, and business processes carried out by health-care institutions, medical staff, patients, insurance companies and the state, in order to ultimately improve the health condition of a patient. His/her position and role in the process have changed to make the patient an active participant instead of a passive object.

E-healthcare eliminates the need for paper as a medium. Instead, information about the patient and his health condition is recorded electronically, which, on the other hand, provides for easy access to such records, either locally or via the Internet. The records are available regardless of where the patient and medical staff may be or the medical records stored. A system used in providing medical services becomes entirely irrelevant.

The patient is the sole owner of this information. His physician, health center he received treatment in, his insurance fund and the state are just the authorised entities that can get limited access to the patient's medical records, based on his/her explicit consent, to carry out their duties. The patient can ask for any piece of health information at any time, and obtain it in an electronic form. The physician and the given medical institution may use this information for prespecified purposes only.

Thanks to the Internet, the patient can always learn more about his/her disease, different treatment methods and success rates, the institutions offering proper treatment, conditions related to it, the cost of the therapy and insurance.

Medical care is an economic category, too. Introducing e-business in healthcare institutions has prevented healthcare price rises, maintained the quality of medical services and made it impossible for the scope of patient's rights to be reduced. This is the result of lower costs building independent information systems and decision-making support systems, growing productivity of employees, the use of the Internet and the introduction of the B2B business model in the healthcare protection chain. Owing to the new model, all members of the chain can improve their efficiency, reduce transaction costs and provide real-time information. Rendering medical services has been simplified, and the more reasonable distribution of medical materials has given good results in terms of savings, since it is easy to analyse the stock and make orders timely and by choosing the best offer on the market.

Thanks to real-time information, it is possible to produce accurate reports on the use of hospital capacities and occupancy rates. It is also easier to monitor treatments and check exchanged information. An analysis of the reports paves to way to strategic planning and a clear social and demographic picture of a nation.

In general, health information systems within the SEE region and in Serbia are largely outdated and paper based. Coordination is not present, and ICT is deployed in a fragmented and duplicative way.

There is no properly structure, operational and efficient healthcare information system that would be a pillar for the entire healthcare sector. Accordingly, no one can have an accurate picture of the current situation, which hinders plans for the future as well. In such an environment, room for inefficiency and abuses of all kinds is wide open.

In August 2002, a sector for international cooperation and project coordination was formed within the Ministry of Health. Cooperation with the World Bank and the European Union resulted in the realisation of several projects. Bilateral projects and donations have been also materialised with several countries, the European Investment Bank, ECHO, UNDP, UNICEF, the International Red Cross, EPOS, the Global Fund, USAID...

The international partners that appeared in 2002 contributed to drafting several documents that have served as a basis for health reform, namely, the 2002 Serbian Healthcare Policy, the 2002 Vision of Healthcare System in Serbia, and the Strategy for Healthcare Reform until 2015, presented in the publication Better Health for Everyone in the Third Millenium (2004).

8.2. Goals

In building e-healthcare in Serbia, the proceeding point should be the genuine situation in the sector at home and abroad, having in mind possible developments in the future. The goals should include the following:

- Modernisation of the health care system by implementing health information networks, online health services, electronic health records and telemedicine technologies,
- Promote collaborative efforts of government, planners, health professionals, agencies and international organizations for creating a reliable, timely, high quality and affordable health care and health information system,
- Promote continuous medical training, education, and research through the use of ICT,
- Respect and protect citizens right to privacy and secure patients data
- Facilitate access to the world's medical knowledge and locally-relevant content resources for strengthening public health research and prevention programmes
- Minimise administrative burden for hospital staff, doctors and patients by appropriate ICT services, tools and devices
- Promote public health by offering high quality content about healthy living and illness prevention at health-related Web portal.
- Alert, monitor and control the spread of communicable diseases by improvement of common information systems.
- Promote international standards for health data exchange

- Encourage the adoption of ICT to improve and extend healthcare and health information systems.
- Improve health care of vulnerable population, especially in remote and underserved areas.
- Strengthen and expand ICT-based initiatives for providing medical and humanitarian assistance in disasters and emergencies.
- Fulfilling obligations from eSEE Agenda and WSIS Action plan

Use of ICT should enable healthcare change in a way that will improve patients care and public health, minimise costs, save money and time and provide information for technical, scientific, administrative, accounting and managerial uses.

A healthcare information system is a base for the entire healthcare system. It will make it possible for authorised entities (and the public, under certain circumstances) to have access to information that mirrors the situation in the healthcare sector in general. The Healthcare Information System (local initials: ZIS) allows for accurate cost records and the monitoring of performance parameters for each participant in the system, which makes the entire process transparent. This access also allows for precise development plans and strategies, which blocks arbitrariness and narrows room for abuses.

A good healthcare information system benefits everyone. It provides the state with good analytical information for a national healthcare development strategy, and allows for ongoing planning and regular assessments of the situation in the sector. Insurance funds can count on transparency necessary for their operations, involving them in a healthy competition game on the market. Physicians find it easier to obtain desired medical information about the patient through an electronic medical record and consultations with colleagues from distant areas through telemedicine. The patient, on the other hand, has easy access to his/her own records, helping him/her to chose the most suitable medical service and pay for it.

Since the accountability of all participants in the medical treatment process can be gauged and checked, resistance to the new system are expected. As this expectation may be reasonable, it deserves no justification. Proper regulations and IT knowledge will help overcome the problem.

The ZIS must be based on powerful computers, devices able to store enormous quantities of different information, specialized software packages, fast communication links, safe data transmission protocols and well-defined procedures to preserve the integrity of the system.

A developed healthcare market demands utmost responsibility from physicians, which is why they have to have proper working conditions. E-healthcare and a new ZIS constitute an optimal solution in this respect, because they give them efficient access to medical documentation and professional literature alike.

One of the important aspects of e-healthcare is telemedicine, which involves a set of procedures and the use of ICT in rendering healthcare services. The transmission of medical information regardless of distance makes irrelevant the physical location of a patient, service provider and equipment. It can be applied in each phase and healthcare method. Teleconsultation provides remote access to information stored in expertise bases, or though contacts with specialists. Telediagnostics makes it possible for a

physician who is away from the patient to make a diagnose. Telemonitoring allows for the monitoring of physiological parameters of a patient outside a health institution. Teleconsilium makes it possible for several medical experts from different locations to meet via teleconference. The purpose of teleeducation and teletraining is to train medical staff, and help it learn how to use remote databases that are not necessarily linked with medicine.

Instead of a paper-based medical record that includes laboratory findings, X-rays, physicians' opinions, discharge papers, medical history and social and demographic details, there is its modern, alternative – an electronic version of the patient medical record kept by doctors and hospitals. The data in the record are controlled by and intended for use by medical providers. This record is known as the Electronic Medical Record, Electronic Patient Record, Electronic Health Record, Computerized Patient Record or Computer-based Patient Record.

Electronic Medical Record (EMR) includes all information about the patient, collected by all health institutions he/she has ever got in touch with. The EMR content comes from different sources, and can be complemented with other relevant data (exercise, diet, psychotherapy, counseling, and the like), which then results in a unified collection of all important information about the health condition of a person.

If these records can meet legal requirements and professional standards, they can be transferred to anywhere in the world via the Internet, with their content safe and valid. The healthcare information system that supports such concepts allows for broad international connections. A person's medical record will be available wherever he/she might need it. As fragments, they can exist in different databases, and the personal medical record is formed only upon the patient's request and authorization.

Building such an information system requires an approach that would involve independent bodies and professional association in different areas, which will give initial recommendations and suggest relevant standards. After that, together with other participants in the health-care system (the Ministry of Health, the Government, insurance funds, medical institutions and professional associations), they will agree upon concrete solutions. When the adopted legal norms, recommendations and standards have been offered to service provides as a proper and impartial regulatory framework, they will be able to offer tangible solutions, the quality of which will be under control of specialised and authorised competent bodies.

8.3. Vision

Our current system is highly fragmented and lacks even rudimentary clinical information capabilities. Vital data sit in paper-based medical records that can neither be accessed easily nor combined into an integrated form to present a clear and complete picture of patient care. Everyone who uses the system constantly confronts large gaps in needed information and spends a lot of time searching for and organizing information.

This information inadequacy is pervasive. Clinicians must often provide care to individuals without knowing what has been done previously and by whom, leading to treatments that may be redundant, ineffective or even dangerous. Patients who wish to collaborate with their doctors in managing their own health are given little information with which to work. Inadequate availability of patient information, such as the results of

laboratory tests, could lead to the medical errors that will result in adverse drug events, a problem that could be improved by the use of information systems able to communicate with one another.

In addition, the pace of medical research is slowed because important information is difficult to collect and analyze. On a broader scale, there is a need to piece together the information needed to identify and respond to a host of health threats that range from naturally occurring disease to deliberate bioterrorism attacks. Recognizing and responding to this challenge carries large demands for the collection, analysis, coordination and distribution of health information.

In order to improve the health and health care of our citizens we have to transform how information flows through all segments of the health care system. Achieving that goal requires creating a dynamic, networked information infrastructure that, in turn, must reliably ensure the private and secure movement of vital health information at the time that it's needed to the place where it's needed.

The stakeholders representing every part of the health care system have to address technical and other issues that must be solved in order for computers at any health care location in the country to be able to exchange and make use of information.

Information is the currency of modern health care. Knowing a persons family background, history of diagnoses and procedures, test results and medications, and diet and exercise habits is essential to managing health, assessing problems, and preventing medical error. Today medical information is scattered among the many healthcare providers people see throughout their lives. It is stored in individual memories, on scraps of paper and in spreadsheets on personal computers. Some doctors and hospitals keep computerized medical records, but most personal health information is stored in paper files. There is no coordinated system, no standardized, private and secure way to integrate an individual's health information in one place. A visit to a new doctor means new forms to complete, new tests to run and new conversations reviewing your personal medical history – conversations that depend almost entirely on memory alone. People need effective tools to help them manage their health and their care.

An Internet-based set of tools that allows people to access and coordinate their lifelong health information and make appropriate parts of it available to those who need it is called the Personal Health Record (PHR). PHRs offer an integrated and comprehensive view of health information, including information people generate themselves such as symptoms and medication use, information from doctors such as diagnoses and test results, and information from their pharmacies and insurance companies. Individuals access their PHRs via the Internet, using state-of-the-art security and privacy controls, at any time and from any location. Family members, doctors or school nurses can see portions of a PHR when necessary and emergency room staff can retrieve vital information from it in a crisis. People can use their PHR as a communications hub: to send email to doctors, transfer information to specialists, receive test results and access online self-help tools. PHR connects each of us to the incredible potential of modern health care and gives us control over our own information.

The PHR is a single, person-centered system designed to track and support health activities across one's entire life experience; it is not limited to a single organization or a single health care provider. The PHR differs from the electronic medical record (EMR) –

a computerized platform for managing detailed medical information collected during a hospital stay or in a doctor's office. EMRs usually contain a health history, doctors' notes and laboratory and radiology results and are generally owned by and limited to the information collected by one doctor or hospital. The EMR rarely contains information provided by the patient. Not all doctors use electronic medical records and many different systems exist, so when people change doctors or move to a new city their personal health information does not move with them. New data standards will make transfer of clinical data between doctors more common, but even connecting different doctors' medical record systems will not tie together all the important health information for each patient. An EMR might indicate that a doctor wrote a prescription, but it would not show whether the patient filled the prescription, took the medication or if the treatment worked. EMRs can supply information to PHRs, but the PHR will also capture information from many EMRs and directly from patients.

The electronic medical record offers the promise of improved care and increased efficiency, but introducing information technology into healthcare creates new risks to privacy as well as new means to protect privacy. Patients are well aware of the potential risks associated with the automation and sharing of their medical information. These concerns can lead patients to withhold from their clinicians information that could be crucial for their care. Clinician concerns about privacy and security can lead to exclusion of sensitive information from medical records reducing the value of the record to other clinicians treating the patient and to researchers and public health officials. However, with conscious forethought and continuous care and attention, the use of information technology in healthcare can and should strengthen, not impair the security and privacy of personal health information.

The PHR has several distinct attributes. Each person controls its own PHR and decides which parts of it can be accessed, by whom and for how long. PHRs contain information from one's almost entire lifetime and from various health care providers. They are accessible from any place at any time and are private and secure. They are also "transparent" in a sense that individuals can see who entered each piece of data, where it was transferred from and who has viewed it. Finally, PHRs permit easy exchange of information with other health information systems and health professionals.

The primary user of the PHR is the individual person. That person may allow access to all or part of the PHR to anyone – a doctor, family member, employer, or insurance company. Other potential PHR users are "stakeholders" who can make valuable use of the information being kept in the personal health record, but only when the primary user of the PHR gives them a permission. In addition to the individual patient, doctors and hospitals may benefit from having quick, inexpensive access to medical information. Employers and insurers may be better able to evaluate and reward high-quality care by looking at aggregate data.

Researchers can assess patterns of disease and treatment across the health care system. Public health officials may be able to detect disease outbreaks. The government and society as a whole may see significant gains in efficiency as more medical decisions are based on current and accurate information. All of these benefits can result from individual users' willingness to share selected health information with the stakeholders mentioned above.

A successful PHR will draw from information collected and exchanged during routine medical care from doctors, pharmacists, hospitals, and insurance companies. People will not have to gather and record all this information.

- All health care organizations and clinicians need to adopt electronic information systems and use common data standards to enable integration.
- Healthcare organizations and clinicians must see themselves as guardians of our health information, rather than "owners" of business information.
- Healthcare organizations and other participants in PHR must monitor and adopt state-of-the-art practices to assure the privacy and security of personal health information.
- Healthcare organizations must work with each other to safely and reliably exchange information across a community network. A key challenge is development of a reliable, consistent method to match patient data between organizations and clinicians.
- Healthcare organizations, clinicians and community leaders will need to create a transparent mechanism for governing PHR systems, so that public concerns about ownership, security, and privacy are addressed.
- To achieve the long-term community and health benefits, financial incentives must be present.

8.4. Key Areas of Action

To articulate a vision for all necessary activities, we must provide strategic direction and oversight and actively undertake efforts to:

- Define ICT policy for health
- Create digital infrastructure (extend and upgrade the backbone communication network)
- Provide affordable access to telephone and internet services
- Establish links with public health information networks and databases
- Build and maintain health portals
- Develop content in local language
- Define clinical paths and electronic support for them
- Create atmosphere of trust by proper legal infrastructure
- Facilitate procedures
- Accept internationally harmonized standard documents
- Reengineer processes with internationally accepted best practice
- Appropriately manage human resources by provision of training in public and private sector
- Use online technologies for availability and quality of health services
- Use wearable and portable monitoring systems
- Develop health telematics infrastructure for telemedicine services
- Develop data warehouse for monitoring and decision making
- Use health services network for collection of statistical data, monitoring and reporting

In this multisectoral and collaborative undertaking (there are technical, legal, economic and institutional issues to be solved) both private and public sector should take active part with government level body as coordinator and promoter. In the first phase the following three objectives should be achieved:

1. Data standards – first step to interoperability

In order to fully address the challenges of improving patient safety and quality of care, we must move from 'siloed' information systems toward an effective information infrastructure. This new infrastructure should enable rapid, secure, private, and integrated communication among varying information systems. All stakeholders have much to gain from data standards adoption and interoperability. Standards, though, are only a means to an end. The ultimate goal is to transform clinical, administrative and financial transactions in order to improve the effectiveness, safety and timeliness of the health care system.

Interoperability is the critical first step in the creation of a 'dynamic connectedness' that allows the movement of necessary health information to where it's needed, when it's needed, in a private and secure manner. The Data Standards Working Group has to be created that will address the following key components:

- Identification of necessary standards
- Identification of necessary standards that are already 'adoption-ready'
- Identification of the actions needed to make all standards 'adoption-ready'
- Demonstration of the value of standards-based electronic data and systems
- Development of a migration framework and strategy for reaching system-wide interoperability
- Commitment and action

2. Privacy and security – the critical ingredients for trust

Collaboration and sharing data within and across enterprises is critical for improving patient care, enhancing interactions between clinicians and patients, and strengthening public health. However, sharing electronic health information can occur only if reliable mechanisms exist to protect the security and privacy of patient information.

The Privacy and Security Working Group has to be formed with the task of identifying health care entities that have developed noteworthy technical and managerial practices; i.e., practices that demonstrate the protection of privacy and security while making broad and creative uses of electronic health information. These entities have to be identified through a review of literature and reports, and through the extensive knowledge of the industry that exists within the membership of the Working Group.

3. Personal health – the promise ahead

Because no single clinician or health care entity has possession of all the health information belonging to a single individual, it is important to give individuals the opportunity to have more access and control over their personal health information. Moreover, we believe that giving individuals access to and control over their personal health information will bring benefits to them and to the entire health care system. These include:

- Better ability of patients to maintain health and manage their health care
- More reliable care; e.g., in emergency situations

- Better quality and safer health care by using computers to identify possible problems
- More efficient care, with less duplication of tests and quicker access to results
- More effective communication and collaboration between patients, doctors, pharmacies, and others
- Improved satisfaction, lower cost and greater choice

Personal Health Working Group should define high-level characteristics of the personal health record; identify consumer requirements and concerns related to that personal health record; and disseminate those findings.

9. E-BUSINESS AND E-BANKING

9.1. Introduction

At its core, electronic business (e-business) means the automation of business processes through enhanced information and communication technologies, and it provides an effective means of conducting business both nationally and internationally. According to *e*Europe 2005 Action plan *e-business comprises both e-commerce (buying and selling online) and restructuring of business processes to make best use of digital technologies*.

Serbia must generate and exploit new economic opportunities through the adoption of e-business practices in order to reach the following goals:

- To promote economic growth and social development,
- To enhance business efficiency and productivity,
- To decrease the cost of doing business,
- To enable domestic companies easier re-integration to European and world market.

Application of e-business in various sectors of national economy increases the linkages and interdependence among computerized networks of private and public organizations involved in internal and international economic activities. In this way, the national economy is moving from interaction of atomistic actors to an integrated system of information flow management and gets the characteristics of e-economy- information based society.

In modern globalized era of world society development, e-business is the world's growth engine. Not to move with e-business is to limit your nation's growth.

Advantages of e-business applications can be defined as following: efficiency improve in terms of lower costs, improve effectiveness in terms of widening market potentials and better meeting of customers` need, enhanced product and service innovation through customer-supplier interaction, raising competitiveness and employment possibilities.

9.2. The concept-vision of e-business

E-business is a generic term, which covers information definition and exchange within and between firms and countries, including customers, to achieve a given business objective using information technologies. Unlike e-commerce, it implies the creation by businesses and Governments of linkages among computerized systems of exchange of information, which suppose a certain level of interdependency.

The development of e-business in a country is a multisectoral and collaborative undertaking as the process cuts across a broad range of technical, legal, economic and institutional issues. In e-business development both the private and the public sector should take an active part. As a rule, the private sector takes the lead in technological developments and practical e-business applications, and Governments in (a) creating an enabling environment, (b) facilitating the coordination of private/public sector e-business initiatives, and (c) supporting the establishment of an Information Society, including the preparation of the general public, SMEs and the public sector for the opportunities

offered by new information technologies. Given the multisectoral nature of e-business and the need to associate both the private and the public sector to the process of its implementation, it is important that individual and potentially scattered efforts be streamlined, coordinated and promoted jointly by all relevant players in a country. It would be useful to create guidelines and mechanisms for public-private partnership (PPP) in e-business development aiming to initiate and enable coordination and cooperation between specific industrial sectors and the government how to optimally use ICT in order to increase their performance and competitiveness.

9.3. Government as e-business promoter

The Governments of the eSEE countries as well as of Serbia should include e-business in their development strategies in order to keep pace with developments in the rest of Europe and the world economy, and avoid a situation where they would find themselves at comparative disadvantage.

The framework for e-business cannot emerge by itself. National authorities should be involved in its creation, taking into account the evolving circumstances in the increasingly global economy. Firstly, as the strategic choice of Serbia is integration with the European Union, its policy should be aligned with the spirit and recommendations of the *e*Europe programme and EU legislation in this area.

Government Centre for Informatics (GCIS) responsible for the Information Society may set up **coordinating committee** representing relevant private/public sector players to coordinate the development of the e-business framework in line with European and international standards.

This **coordinating committee** should be in charge to:

- Map the current state of e-business in the country,
- Identify the conditions, gaps, and obstacles, for implementation,
- Prepare a strategy for the creation of an e-business enabling framework,
- Monitor progress made and re-adjust action whenever needed,
- Suggest the elimination of the administrative barriers,
- Liase with and actively participate in international initiatives in the area of e-business, including the e-Southeast Europe Working Group (eSEE), the *e*Europe programme, UN/CEFACT, and UNCTAD, etc.
- Keep it abreast with the availability of new tools and standards for e-business. The tools for doing business electronically include electronic mail or messaging, Internet (e.g. electronic documents written in HTML, XML and/or using Web services), electronic data interchange (EDI), smart cards, electronic fund transfers, automated data capture, bar codes, etc. The GCIS and other relevant agencies should assist the acceptance of these tools in the business practices in Serbia. With reference to security in network services and infrastructure, appropriate medium-level encryption techniques should be used to protect data and information.

The strategy for the creation of an e-business enabling framework should consider the following issues: business process analysis and re-engineering; adapting the national telecommunication networks and educational systems to the development needs of business; creating the legal basis for e-business, in compliance with the *acquis*

communautaire; and harmonizing document and data requirements with international standards and requirements. In this sense, national standardization institutions should be involved in building the Information Society, and implementing in it international standards for ICT and e-business. Relevant experts from the standardization institutes should participate in the Government level Body in charge for Information Society development.

Also, one of the key responsibilities of the public sector is to create *a trustful and secure environment* for e-business. This would include: a reliable legal framework for doing business electronically, where actors would trust electronic transactions the way they trust traditional ones; intellectual property protection of ICT innovations and digital products; and action to protect companies and users of the network against spam and viruses.

The Government, through the Government Centre for Informatics and the coordinating committee, should inform its stakeholders in both the private and the public sectors on its strategies and actions undertaken to develop the framework for e-business in the country, including time schedules. It is the Government's responsibility in Serbia to follow the development of new legislation and directives in the EU, so that they can be reflected in the practices in their countries. This information is an important element of the business environment and its availability will considerably facilitate decision-making at the level of the company or the various administration offices.

Government Centre for Informatics is entrusted to coordinate the elaboration of the e-business framework, and it should cooperate with agencies and industries that already have experience in e-business, such as chambers of commerce or national trade facilitation bodies (PRO Committees). Developing the framework for e-business is like the provision of any other public good; it needs the collaborative and coordinated effort of public and private stakeholders.

Governments should set realistic timeframes for the implementation of e-business in the public administration. The Government Centre for Informatics could serve as a platform where public and private initiatives encompassing different individual sectors would be coordinated and harmonized, with a view to obtaining maximum synergy among all efforts to introduce e-business in the country. The degree to which every sector adheres to coherent e-business practices will have a decisive influence on its ability to fully participate in the expanding electronic marketplace. The GCIS can facilitate the drafting of guidelines for each individual industry or sector, and also involve sectors and actors with less experience in the area.

What should also be kept in mind is that fact that the public sector can play a special role in the process of promoting e-business in all sectors of the economy and can act as a catalyst in adopting e-business practices by implementing:

- **Public procurement contracts based on an electronic solution**, which could encourage private enterprises to introduce or increase the use of electronic means of data transmission in their work. Suppliers will then have the ability to participate in a broad scale electronic document interchange. As a result, companies will have an additional incentive to use e-business solutions, as this will improve their chances to stand competition;

- **Electronic transmission of data in the public sector financial system,** which could equally have an important catalyzing effect on implementing e-business. Electronic transmission of data in the public sector financial system will make information flows in the financial sector between enterprises and relevant public authorities, such as annual accounts and tax returns, less time-consuming, less expensive and more accurate, and will reduce the administrative burden on companies. The degree of success of the interaction between the public and private sectors will depend on how well the parties manage to coordinate their respective activities.

9.4. The implementation process of e-business

The implementation process of e-business is very complex and should be realized through the following steps:

9.4.1 Creation of telecommunication infrastructure and affordable access to Internet services

The first step in creating conditions for e-business is to build, over time, adequate digital infrastructure, that is to establish a reliable and secure network infrastructure. Telecommunication networks and, in particular, the Internet are the pre-requisite of e-business. On the one hand, the Internet can be seen as the potential for "near universal connectivity". Also, Internet is only a tool, which should be regarded in its interaction with other factors. In any country, the government should make a coherent effort to create not only the basis for universal access to Internet, but also a framework for training and an environment of recognition of business over the Internet, so that e-business practices will be acceptable from a legal, professional and social perspective.

9.4.2. Application of business process reengineering

For individual enterprises, the private sector as a whole, public administration and the way the public and private sectors interact, introduction of e-business offered an opportunity to re-engineer their practices and procedures, and to switch in an integrated way from traditional paper-based processes to electronic means in the exchange of data. This would result in savings of cost and time for both companies and whole countries.

Re-engineering business processes should not be seen as a mechanical act of replacing existing business processes with electronic ones. Such a mechanical approach may complicate the process and increase cost. The re-engineering process should involve analytical work in every specific case, so that the proper decisions are taken, and the use of new technology simplifies and makes more efficient the work of people. The shift in technology should correspond to a shift to business practices, which are voluntarily accepted, so that people are willing to learn and change their business routine. The first step in the analysis and re-engineering of business processes should be to look at the needs of both business and the regulatory authorities, and at the requirements of the international supply chains. The re-engineering of the business processes should start from addressing these needs. The next phase only would include identifying and implementing IT solutions that can fit these requirements.

Through the business process reengineering the concepts of the firm and other economic operators change. They shift from the organizational structure to the way work is organized, the business process, the demand of the market, and the potential of new technology. Economic activity is reorganized around the idea of reunifying the tasks of various agents into coherent business processes.[7] The "new economy" transforms the way business transactions take place. Limiting the reselling of goods and services through direct B2C and B2B transactions saves resources. e-business gives birth to "community business" and a "networked economy".

Business processes re-engineering, which makes use of ICT, should take into account internationally accepted tools of risk analysis and risk management. It should reflect full awareness of the substantial risks involved in international trade, especially from drugs and arms trafficking, terrorist activities (including financing from otherwise legitimate business), and various forms of theft. Modern ICT tools, together with partnership between control bodies and business, should be used for both security and facilitating business.

E-business will affect individual **companies**, whose logistics processes need to be re-engineered to reflect the new technological environment. Such concepts as Supply Chain Management, Value Chain, and Information Supply Chain Management increasingly gain ground. The aim is to improve the total performance and cost-effectiveness of an organization through optimizing all internal and external operations necessary to deliver a product or service across company boundaries to the final consumer.

9.4.3. Facilitation of business processes and acceptance of internationally harmonized standards

Facilitation of business processes in terms of simpler procedures and internationally and internally harmonized standards has to take place prior to any meaningful attempt at doing business electronically.

The most important step in the process of creating the foundations of e-business in Serbia and other countries of this region is the harmonization of documentary and data requirements for international trade as a prerequisite to doing e-business in all countries of the region.

Harmonizing documentary and data requirements would be a step in the development and implementation of such important elements of e-business as: (1) national electronic documents aligned with international standards and (2) systems for single, electronic submission of trade and transport data for both nationals and foreigners.

Ultimately, this harmonization should be focused on standards and requirements, accepted by the European Union, the World Customs Organization, the United Nations, ISO and other international organizations. For example, the alignment of customs declarations to the EU Single Administrative Document (SAD), itself based on the United Nations Layout Key (UNLK), would help create compatible electronic documents, for example in the eXtensible Markup Language (XML), which can easily be exchanged in

[7] The World Bank has made re-engineering of business processes a condition in Russia's customs reform. See www-s.worldbank.org/servlet/WDS_IBank_Servlet?pcont=details&eid=000094946_03041004024340

advance of the actual movement of goods, thus facilitating risk analysis, single submission of data and a faster movement of goods. In perspective, this would provide the basis for linking national economies to the European computerized systems for binding tariff and trade information, VAT regime, etc.

Also, this will allow the Single Electronic Window approach to foreign trade which means that foreign trade is managed by a lead agency enabling in this way a single submission of all required data in electronic form from the company's office. That is, in many countries, actors involved in international trade are required to submit a large volume of documents and data to a number of agencies, and the demands for information are often repetitive. Establishing a Single Electronic Window would mean setting up a system that would require traders to submit information and/or documents only once at a single entry point. The Single Electronic Window is generally *managed by one agency, which informs the appropriate agencies, and/or directs combined controls.* A Single Electronic Window does not necessarily imply the implementation of high-tech ICT, but its functioning will be greatly enhanced if governments identify and adopt relevant ICT for a Single Electronic Window. As the Single Electronic Window approach integrates various public and private players in the information supply chain for business, it is an important element in building the Information Society.

A Single Electronic Window would give administrations the possibility for optimal use of their personnel and databases. Trade and transport operators would benefit even more in terms of reduced time and cost in using a single electronic interface with the administration. Electronic data transmission with Customs will help spread e-business practices among import and export sectors, banks, insurers, and other players involved in international trade.

Implementing a Single Electronic Window is a significant undertaking, involving many stakeholders and requiring commitment from both public and private players. It is essential, therefore, that a systematic approach be adopted from the outset. The key steps involved in the process of initiating a Single Electronic Window might be:

- Developing the initial concept for the Single Electronic Window in a country (research, fact-finding missions by experts)
- Building explicit political will and making a decision to examine the feasibility of a Single Electronic Window
- Creating a Project Management Group involving key representatives of the relevant state agencies
- Undertaking a feasibility study (one of the key issues is to analyse and recommend which agency should manage the Single Electronic Window).
- Considering the feasibility study report.
- Implementation (pilot, phased or full), which includes: harmonization of data requirements (by an interagency body); implementation measures by the lead agency and the other agencies, such as harmonizing legal procedures and document and data requirements; selection and development of a software platform. [8]

Harmonization of documentary and data requirements for international trade is basement for the improved management of trade information flows, which would benefit

[8] see http://www.unece.org/cefact/recommendations/rec33/rec33_ecetrd352_e.pdf

both business, through simpler and faster procedures, and security in international trade through better information gathering, and better risk management.

9.4.4. Appropriate management of human resources

Business process re-engineering and related systems applications should be integrated through appropriate management of human resources and, especially, by the provision of training in both the public and private sectors.

In order to create conditions for e-business, it is important to build, over time, ICT skills through the national education system and programmes targeting SMEs.

Both public and private sector should encourage higher-level ICT and e-business skill formation, which should include marketing, organizational, security, trust and management skills, in conjunction with educational institutions, business and individuals.

9.5. The key areas of action

The key areas of action are the following:

- Awareness building, training and education
  - Training and education
  - Awareness Building

- Access and infrastructure
  - Infrastructure
  - Access
  - Telecommunication sector reform

- Legal and regulatory issues
  - Legal issues
  - Taxation

- Support for the enterprise sector

- Sector specific policies
  - Trade and investment
  - Development of IT and other sectors

- Banking and online payment

- Others
  - Research
  - Participation in international database
  - Benchmarking

9.5.1. Awareness building, training and education

Awareness is needed at all levels, ranging form policy-makers (in order to launch the reform process) to local communities and enterprises (to help them identify new opportunities). Training and education to provide consumers and enterprises with

necessary skills to use the new technology efficiently. Government can play an important role in enhancing digital literacy through the country's basic education system. Improving Internet access and the number of computers in schools and training teachers in the use of ICT in the classroom will improve education and contribute to new generation of IT – literate children. Apart from basic computer education in schools, countries will also need IT professionals as well as business people wit IT skills. The demand for IT skills is not limited to ICT sector but is present in all areas of economic activity, as ICT becomes essential part of every enterprise. Since woman are particularly underrepresented in ICT related professions, programmes supporting female enrolment are important element of national strategies in area of education and training. What should be kept in mind is the fact that thousands of workers are unemployed and many more will become so during the process of privatization and restructuring. Social programs should be used to retrain them for the new economy by emphasizing training in ICT skills and reducing the number of retraining programs for the old economy jobs. It is important to create national electronic job market that is skills based.

It is necessary to involve the entire society in the issues concerning Information Society development. There must be constant, public, strong leadership from the very top. Without the top politicians being actively involved in promoting these issues, lower ranks of the government officials will not consider this issue a priority and the society at large will not accept it as essential for their future. Public/Private partnership is essential in securing common ownership of the goals. There must be constant and open communication through which problems will be identified and solutions agreed upon. Public at large must be made aware of the importance of these issues through constant media coverage. Media should present positive examples and emphasize success. Experiences of other countries in transition should be carefully analyzed and all relevant and applicable solutions should be applied in Serbia in order to save the time and money.

9.5.2. Access and infrastructure

Telecommunication networks and, in particular, the Internet are the pre-requisite of e-business. E-business cannot realistically take place on a meaningful scale until a sufficient critical mass of users is gathered that would be in a position to change the ways businesses and public administrations operate. This implies both a physical availability of sufficiently powerful telecommunications infrastructure, and a cost of access/operation, which is affordable also for smaller players. Governments should take these concerns into account when they develop their policies for liberalization, deregulation and de-monopolization, and their incentives for increasing competition, while encouraging investment in infrastructure and lowering the costs of access and use of telecommunication networks. The effective reform of domestic telecommunication sector should include three key elements: private –sector participation, market competition and the creation of an independent regulatory body.

An important objective to be considered when reforming the telecommunication sector is to ensure that services are equally available in all parts of country. Numerous approaches to tackling this problem include imposing on the telecommunication provider specific targets for covering the country's rural areas and establishing a network based on village mobile telephones.

Governments in Serbia and in other SEE counties should focus on developing capacity for broadband Internet in order to create an enabling framework for e-business in their countries. For e-business to be effective and efficient, broadband connectivity is very important. Broadband connectivity and e-business are strongly interconnected. Broadband connectivity will facilitate deployment of e-business applications while e-business will provide the electronic content that will boost the demand for broadband connections. A broadband Internet connection can carry at high-speed complex information (such as video or graphic, sound and visual information), while PSTN and ISDN Internet cannot.

To provide universal and inexpensive Internet access which is essential for ICT investment, there must be multiple, high-bandwidth choices for businesses and consumers. Appropriate Telecommunications Act should be adopted, which is conducive to ICT investment. In order to foster growth and encourage competition, Internet and other value-added services must remain unregulated, with free entry into the market of any number of players. Market will determine value of each provider, rather than the regulatory body. It is also necessary to adopt latest European Union directives on telecommunications in order to avoid redrafting of the law in the near future. Universal right to Internet access and local loop unbundling provisions should be adopted at a minimum.

9.5.3. Legal and regulatory issues

An important concern of many countries is that existing legal framework may not adequately accommodate e-commerce/e-business, and that existing laws centering on paper-based system may prove a barrier to increase global e-trade. The existence of a predictable legal framework has likewise been singled out on a number of occasions as an essential tool for enhancing the level of trust of both business and consumers in commercial transactions. Since legal security and trust are major issues in any trade transaction, the credibility of e-business as a whole will depend on national legislators' capacity to define and create a sound and comprehensive legal environment for e-business that would build up trust and confidence. Ideally, national legislation should be passed that gives digital signatures and electronic documents the same legal status as written signatures and paper documents. The use of ICT to conduct trade transactions poses a number of legal challenges concerning, for example, the validity of documents produced and exchanged electronically, security of transactions and trust, copyright and ownership issues in trade using a website.

Concerning consumer confidence in e-commerce Serbian Government needs to boost it in partnership with consumer groups and industry. One of the possible approaches is to promote alternative dispute resolution, trust makes and effective codes of conduct. It is necessary to transpose to Serbian legislation the Directive 97/7/es on the Protection of consumers in respect to Distance Contracts and Directive 2000/31/EC on Electronic Commerce in section dealing with consumer protection.

Legal activities at the national level should be pursued in close coordination with international developments and initiatives in order to ensure the compatibility of national legislation with international norms, such as the *acquis communautaire,* whose implications are the overriding principle for the country, which express its desire to join the European Union. The body of work realized in the European Union, notably the European Directives related to e-commerce and e-signatures, would most likely have a

strong influence on the creation for Serbian e-business legal framework. Nevertheless, Serbia should make its strategic choices for development and reflect its traditional legal culture in devising the framework for e-business.

Equally important is Model Law on Electronic Commerce elaborated by UNCITRAL in 1996[9], which offers a set of internationally accepted rules intended to help states remove legal obstacles to the implementation of e-business, and also reduces disparities that may exist between national legislations on this matter. Furthermore, it seems that the recently adopted UNCITRAL Model Law on Electronic Signature (July 2002) and its Guide to Enactment are currently being considered by number of countries whishing to enact electronic signature legislation. The UNCITRAL model legislation can be a logical starting point but wider issues must also be addressed when building the legal basis for e-business.

Countries wishing to ensure that electronic transactions are legally valid, binding and enforceable must address the following three fundamental questions:

- Is the transaction enforceable in electronic form?
- Do the parties trust the massage?
- What rules govern the electronic transaction?

Having this in mind, it seems that the key issues to be addressed in building the legal framework for e-business include:

- Data protection;
- Secure (legally and commercially) contract formation;
- Regulation of the environment of the Internet;
- Electronic signature validation;
- Consumer protection / distance selling;
- E-privacy;
- Dispute resolution issues (including On-line Dispute Resolution or ODR issues)
- Anti-terrorism security / money laundering / spamming issues
- Intellectual property rights
- Regulations on Internet content
- Act of Electronic Archiving
- Freedom of information access act
- Act on personal data protection.

Taxation policies

Taxation policies also have the potential of fostering or slowing down the development of an e-business framework. The *Taxation Framework Conditions*, developed by the OECD, set out the following taxation principles, which should apply to e-commerce and e-business: neutrality, efficiency, certainty, simplicity, effectiveness, fairness and flexibility. The Internet is certain to affect public finances. On the one hand, e-commerce transactions may substitute for conventional sales, posing a threat to tax revenues, as long as e-commerce remains tax-exempt. On the other hand, the Internet can facilitate

[9] http://www.uncitral.org/english/texts/electcom/ml-ecomm.htm

both tax collection and the processing of tax returns, reducing the revenue leakage and transaction costs associated with the tax system.

In European Union, the tax environment of e-commerce has been adapted and simplified, mainly through the adoption of a directive on electronic invoicing [10] as well as a directive and a regulation on VAT on digital supplies[11] .

9.5.4. Support for the enterprise sector

Stimulation and support of private sector is very important for Serbia. Administrative procedures have to be changed to foster firm creation. New companies must be able to be formed within a few days and with a minimum of paperwork. Market, rather than high administrative and regulatory entry bar, should decide which companies are capable of providing quality services.

It is important to: 1) promote the spirit and skills of entrepreneurship - an enterprise-friendly environment for successful start-ups; 2) develop content, where the benefits to a pool of users depends on the usefulness of content in a local (language) context; and 3) create the atmosphere of trust, where entrepreneurs without an international reputation may face a high trust barrier to doing business electronically. Governments and business associations can help in building trust in an interrelated system of e-business, but also by promoting transparency and integrity in the business process, using the Internet to provide full information on requirements, operations and procurement practices.

Special importance should be given to the policies and programmes that support the private sector and in particular SMEs. If the strategy to build the basis for e-business in Serbia and other SEE countries is to succeed, it has to concentrate on the inclusion and support for SMEs to participate in the e-business framework. No economy in the contemporary world has become rich without relying on the existence of a stable middle class; and one should not expect that Serbia will make an exception. The framework of *e*Europe 2002 and *e*Europe 2005 include clear policy priorities, for example in support of the Go Digital initiative for SMEs, support for the creation of an e-business dynamic environment.

The development of (anti-bureaucratic) One stop shop for business, is to have substantial impact on lowering the administrative burdens for SMEs with electronic support for establish enterprises through the internet and establish new entry points for consulting for starting business and especially SMS.

The European Commission targets to establish an European e-business support network, federating existing European, national and regional players in this field with a view to strengthening and coordinating actions in support of SMEs in the field of e-business. The Commission was also fostering geographical and sectoral clusters of SMEs working online to encourage innovation in e-business, sharing of good practice and promotion of guidelines and standards.

---

[10] Council Directive 2001/115/EC of 20.12.2001, OJ L 15 of 17.1.2002.

[11] Council Regulation (EC) No 792/2002 of 7.5.2002, OJ L 128 of 15.5.2002 and Council Directive 2002/38/EC of 7.5.2002, OJ L 128 of 15.5.2002.

9.5.5. Sector specific policies

A number of different policies related to trade, investment and the development of specific industry sectors have been included in the e-business agenda.

Common change in trade policies include the lowering of important tariffs on computers and other hard and software, which are important imputes into the domestic IT industry.

Developing the domestic IT sector can be critical for increasing ICT usage in the economy as it provides key inputs for companies, which want to move into e-business. It was suggested that domestic ICT companies must be encouraged and supported by both being given a chance to develop local software solutions, and by partnering with large foreign companies in delivering localized versions of existing software and best practices from the world.

Policies to attract foreign capital for the development of IT–related industries are very important. Offering financial incentives is one of the possibilities, which can have costly impact on domestic budgets. It is important that the foreign companies create as many linkages as possible with the domestic economy through domestic suppliers, software development firms and other services. Serbia must have dramatically better commercial conditions than its region in order to attract ICT investment. Corporate tax rates must be eliminated for new investment in ICT for a number of years and be substantially lower than in neighboring countries at all times. Sales tax for ICT products must be eliminated. Accelerated depreciation rate for ICT products must be allowed. Sovereign guarantees must be provided for capital investment in manufacturing plant and distribution centers.
In order to make SCG attractive for ICT investment, SCG legal system must be brought in alignment with the EU regulations. Privacy protection and data handling, intellectual property rights, criminal code, contract law, electronic signature law, electronic commerce law, telecommunications law, and many others need to be enacted to provide a secure and stable business environment attractive to foreign investors. Some modern and well-written laws exist, such as intellectual property protection law, but are lacking enforcement mechanisms. Passing laws is not enough – political will, funds and expertise must be secured for their proper enforcement.

Sectoral policies aim at strengthening the use of ICT and e-business in specific economic sectors where the country has a comparative advantage. For Serbia it could be the following sectors: foods and beverages, textiles, software industry, transport, natural medicines, pharmacy, etc.

9.5.5.1. Development of IT and other sectors

Customs and **transport** have a key role in the development of a secure e-business framework.

Customs should rely more on innovative automation and electronic information systems for several reasons, such as:

First, it is internationally recognized that the delivery of high standards of customs service requires a set of integrated, highly automated activities, which are based on transparent legislation and simple and well-understood procedures. International trade facilitation and e-business standards endorsed by the World Customs Organization

(WCO), UNECE, UN/CEFACT, the World Bank and other international agencies should be made part of national development strategies.

Second, implementation of ICT tools should aim at decreasing the discretionary powers of single officers, thus decreasing the potential for corruption. For example, the introduction of a Single Window system for the single submission of trade data by the trader, to be shared by various requiring agencies, will eliminate a situation when one agency (agent) is responsible for registering and controlling trade data.

Third, the use of ITC for advance submission of data or databases for building "reputation" records of trading companies is indispensable for risk profiling and improving security measures in trade.

Customs in Serbia should develop a secure system for advance electronic exchange of information and intelligence, while developing partnership with the business community based on certain shared e-business tools. Some of the countries in the region are already using automated customs systems such as ASYCUDA, ALICE or some proprietary solutions. The use of these systems should be integrated across borders and with the business community. Consequently, it is important that national customs authorities participate in the construction of an e-business framework in the country. Electronic data transmission with Customs will help spread e-business practices among import and export sectors, banks, insurers, and other players involved in international trade.

Transport sector in Serbia should have in mind that advanced information technologies are increasingly used in the shipping and freight forwarding industry. Some of the benchmarks in implementing e-business should be quicker and more reliable delivery of goods, reduced inventory days, faster settlement, reduction in errors and lower costs in LC processing, reduced occurrence of demurrage charges, accelerated and cheaper internal booking processes for transport, reduction in queries per consignment, improved slot fill rate, faster and lower-cost dispute settlement mechanisms, the availability of single windows for filing information both nationally and internationally, electronic customs clearance, reduced security risks and fraud, fewer documentary errors, and an overall improvement of the quality of services and communications with partners and clients.

9.5.6. Banking and online payment

National governments and National body for Information Society Development should encourage, especially through public-private partnerships, on-line banking, e-payment systems, and improvements in the security of payments and information, as part of building the e-business infrastructure.

Electronic financial services have spread quickly in recent years. E- finance allows for establishing financial systems without first building a fully functioning financial infrastructure. It lowers processing costs for providers, search, and switching costs for consumers. Most affected are brokerage markets where online trading is becoming the norm. Increased connectivity has accelerated the migration of securities trading and capital raising from emerging markets to a few global financial centers, with capital raised offshore by emerging markets increasing almost ten fold in the past ten years. The change has also led to deeper consolidations in key middle and back office functions. It will lead to much lower costs and greater competition in financial services as

providing e-finance is much cheaper than providing financial services with existing technologies.

E-finance reduces the need for government intervention as now the private sector can provide financial services even when a country's financial sector is weak. New technology makes better information more easily available. For Serbia, e-finance offers an opportunity to leapfrog.

On the regional level of SE Europe Serbia should work together with other countries to develop further cross-border e-payment, and cross-border recognition of e-signatures, Certifying Authorities (CAs), smart card use, etc. A long-term objective is the integration of the SEE countries in a pan-European system for single payment, e-trading platforms and exchanges.

9.5.7. Others

- ***Research***
  National research institutions should develop project on e-business implementation in various castors of national economy.

- ***Participation in international database***
  Information on Serbian companies should be made available in international online database.

- ***Benchmarking***
  Serbia has not developed benchmarking procedures in accordance with European standards and norms and it is evident that the introduction of some benchmarking system is becoming urgent.

10. DEVELOPMENT OF ICT BUSINESS SECTOR

10.1. Introduction

The Information and Communication Technology (ICT) Business Sector is made up of private enterprises that produce ICT goods and provide ICT-based services.

ICT goods. These consist of hardware, software, and network equipment that are required to generate, process, store, transmit, and present electronic information. This can cover a range of hardware products from desktop computers (and components) to digital cameras. It also includes software, such as back-office accounting packages or telemedicine applications.

ICT consulting services. These consist of service companies that predominantly focus on the ICT sector and the application of technology products. They offer ICT-focused management consulting services to public and private enterprises, which include a variety of services such as ICT strategy formulation and systems implementation.

ICT-enabled services. These consist of information-intensive services that are conducted by third party service providers on behalf of their clients, such as customer call centers and data processing services. This service sector is uniquely enabled as a result of ICTs, as it provides back-end business services remotely to clients who were previously obliged to fulfill these needs on their own. These services can be (and are increasingly being) provided from a wholly different geographic region. The ability to 'offshore' such services has been driven by declining voice and data communication costs, coupled with improved quality and reliability.

10.2.The Role of Software in the Economic Development of Serbia

Software presents an unusual set of problems as well as opportunities for policy makers. As a major global industry, it has been successfully targeted for its export potential by a growing number of countries. At the same time, it is increasingly important as a key element of the commercial and governmental infrastructure. No organization can function in the modern world without the productivity and organizational power that information and communication systems provide. For Serbia there is a high importance of software in economic development and the need for a Serbian software development strategy is evident.

Because software has become over the last 20 years both a major element of modern economic infrastructure and a major industry itself, policy makers are often faced with conflicting goals and complicated decisions. Examples from Silicon Valley to Bangalore would suggest that software might flourish best without government intervention. While this may be true in the long run significant government action has been crucial to seed and nourish software as a part of the ICT infrastructure and as an export industry. Furthermore, every software-exporting country has evolved a unique industry, shaped by the available resources and by the particular global opportunities presented at the time. For developing countries with deficient infrastructure and tight resources, selective government initiatives have been critical to successful software industry development. Some developing countries aim to go further and to influence the development of local software capacity toward applications and specializations that are responsive and supportive of social needs and economic development.

The logical framework for thinking about a national software strategy takes into account several key characteristics of the software industry:

- The different segments of the software industry (shrink-wrapped products, enterprise products, software services, embedded systems, technology licensing, etc.), each with its own global marketplace with unique characteristics and barriers to entry;
- The different kinds of talent and skills that make up software teams in different parts of the industry;
- The key role of innovative startup companies in the industry, the importance of entrepreneurship, venture capital, the developmental stages of a software startup, and the special supportive habitat required by small technology companies;
- The domestic use of "base-level" software that is up to global standards;
- The versatile use of software to meet local development applications and the opportunities to build competencies in technologies that are more appropriate to developing countries' conditions, such as "open source" software; and
- The importance of investment climate and regulatory environment to this innovation-driven and fast-changing industry.

Key steps of this framework would be to: develop an understanding of the economic priorities; inventory current resources and activities; identify relevant trends and opportunities in the ever-changing global software industry; formulate strategies for software industry development that build on dynamic comparative advantage, and design tactics for dealing with specific issues.

10.3. The Role of Software in Development

So, why all this concern about software? Is it really necessary that every developing nation attend specifically to software as a key element of its national development strategy? In our opinion, software is not optional: promoting the development of an indigenous software industry will prove to be a fundamental driver to the development of the country as a whole. In its broad role as an input to all businesses and all governmental activities, the software industry is unique among all industries. It therefore needs to be viewed in a larger context, not simply as one of any number of industries that a government could choose to promote or support. Rather, software is emerging as a core competency or all-purpose technology that is critical to the global competitiveness of most industries and to the deployment of government services in countries at all levels of economic development.

Software capacity is a key to the knowledge economy. The term "software capacity," is defined as the total amount of software that an organization, in this case a country, can build and maintain. Not only is it a critical part of modern industrial infrastructure and an important industry in its own right, but it is also the vehicle for implementing the other key elements of a knowledge economy: responsive and transparent government; a supportive business environment with low transaction costs, enhanced learning environments, and effective social programs. Software-related policy must therefore be distinguished from industrial policy. In particular, software is not just another industry, but a generic technology and core capability that can be deployed across almost all sectors of an economy. Moreover, as a nascent industry and fast-changing technology, market

forces alone are often inadequate to harness the industry's potential to address public services and social priorities and to serve the needs of the poor, rural areas, small and medium enterprises (SMEs), and non-government organizations (NGOs).

There are seven ways that a nation's software capacity can be deployed to create economic value:

- Information systems: operations and strategy
- Software products and "titles" publishing
- Software services to business and government
- Software embedded in products of all sorts
- New, IT-enabled business opportunities
- Software technology licensing
- Specialized services to software publishers

1. Software in the form of **information systems** is a primary instrument of competitiveness in all industries and information-based services. New or restructured national industries cannot compete globally without modern information systems and the people who design, build and maintain them. Governments too must deploy state-of-the-art information systems to support domestic industry and service citizens. Slow and inefficient government transactions with citizens and businesses create a de facto national handicap. Companies and government agencies cannot function effectively without software anymore, but now they have a new set of challenges related to functioning effectively with software.

2. Annual **software publishing** revenues (enterprise and consumer products) have reached $200B worldwide. Digital content, including games and animation, adds another $100M. Furthermore, new markets for software applications will continue to emerge, including major new platforms – platforms that create enormous markets for new software, like the PC in the 1980s and the Internet in the 1990s. New markets and the fortunes they represent are created by a confluence of factors: new technology, plummeting costs of computing equipment, regional economic development, and innovative ideas about how IT can impact people's lives.

3. The global market for **software services** is twice the size of the software-publishing sector, about $400B in 2001. This includes systems integration, consulting, and outsourced software development and maintenance. India's famous software services exports reached about $7.5B last year, still less that 2% of the global market.

4. **Embedded software** is an increasingly dominant engineering component in products ranging from automobiles to toys. It affects R&D, design, engineering, manufacturing, and even service and support. Countries that expect to develop or revive manufacturing industries must expend some of their software capacity on embedded systems. Successive generations of wireless technology will shift more processing into software. As mobile phone technology matures an increasing percentage of functionality is based on software instead of special purpose chips and firmware. Eventually, features and functionality in a wide range of wireless devices will be changed by downloading software on the fly.

5. **IT-enabled services** is one of the fastest growing areas of the global import-export economy: customer service websites and call centers, back office outsourcing (billing, data entry, etc.), on-line services like e-Bay and Amazon.com, and interactive computer games (where players compete over the internet). The degree to which software capacity is required for these businesses varies. All of them depend on state-of-the-art computer systems that require software installation, customization and maintenance, just like a corporate or government IS department. The newest development in software, called web services, may lead to another class of IT-enabled business opportunities – Internet resources used not by people, but by other programs on the Internet.

6. **Software technology** often realizes economic value without actually becoming a product or service. Often overlooked by strategic planners, the market for software intellectual property is important. Large companies license software inventions from other companies or buy small startups that have developed innovative complementary solutions.

7. Finally, a secondary industry has emerged that offers **services to the global software industry**. Localization of software products for a new country, software testing, technical support call centers, etc. Ireland got started in building its $10B software industry by attracting software multinationals with tax and telecommunications incentives.

Matching Software Segments with National Goals

In developing a national strategy for software, multiple goals are inevitably articulated because software's impact is so ubiquitous. A nation's limited existing software capacity must then be used strategically. At the same time, efforts to increase that capacity as fast as possible must be undertaken. Table 1 illustrates the way various types of software business activity impact different possible developmental priorities.

Goals	Information Systems Departments	Software Publishing	Software Services & Outsourcing	Embedded Systems Engineering	IT–Enabled Businesses	Software Technology and IP	Services to the Global SWI
Industrial modernization, competi-tiveness	***	*	***	*			
Employment	?		*		***		***
Government effectiveness and efficiency	***		***				
Hard-currency exports		***	***	***	***	***	
Foreign direct investment		***	***		*	*	***
Knowledge economy development		***	***		***		***
National Prestige		***	*	*	*	***	*

Table 1. Columns represent the seven ways that software capacity can be expended. Each row is a national strategic priority. The more asterisks, the greater the potential impact of each kind of software activity. Initially, the effect of information systems on general employment may be negative, as automation increases the efficiency of manual and clerical workers. *These correlations are our best efforts at summarizing what we've seen in the countries we've studied.*

Not all software industry segments are relevant to all countries. Embedded systems, for example, are far more relevant to industrial competitiveness if an industry like consumer electronics or automobiles is key to the national growth strategy. Indirect job creation varies, but is significant in all segments. Also, the time involved for developing the segments varies. IT-enabled businesses, for instance, could be flourishing in less than two years, once infrastructure is in place and policies and regulations are reformed, assuming an appropriate workforce is available. Developing a robust software products publishing industry, on the other hand, could take many more years, even after the prerequisites are in place.

Balancing the development of the software industry to address the needs of potential local users as well the opportunities for export is important to an effective national software industry strategy and to overall development. Without a software industry that is attuned to domestic users, neither software exports nor social benefits will develop optimally. For example, India's incredible success at moving tens of thousands of talented engineering graduates into software services exports has not led to adequate deployment of these capabilities to address the deficiencies in government services or the competitiveness of local industries, and thus has not had as broad an impact on the country's economy as might be expected

10.4. Balancing Software Export with Domestic Application

The global shortage of software engineers and the fast growth of demand for software applications in advanced economies have attracted the attention of both software talent and policy makers in developing countries. This global opportunity has led to an almost exclusive focus on software exports. This bias is further reinforced by planners' tendencies to focus on a single concern: generating hard-currency exports, driving up employment, or making something happen fast to demonstrate progress and thus a government's effective leadership. To achieve any of those goals on a sustainable basis, a strategy must be balanced. Directing the deployment of software capacity towards social and governmental applications, as opposed to export-focused strategies, should be part of that balance. Moreover, opportunities to manage local software projects and serve local users are often essential to gain experience in software project management and advanced software skills and knowledge domains which are also critical to learning, innovation and moving forward in the value-added chain in software export.

The domestic software industry includes the development and maintenance of government, business, finance and telecommunications software systems, as well as any products and services suppliers into that development. It also includes locally developed software for consumers, including educational and game software. There are several important things to keep in mind about the domestic software industry:

- There are no backwaters in the global software industry. In every software segment, local providers will have to compete for local business with powerful offshore vendors. It is important that local suppliers be given a chance, but they must be required to produce state of the art results.
- Without world-class software, other industries and services like tourism and trade will be handicapped. In fact, competing globally in low-growth, low-knowledge, labor-intensive industries is not a long-term strategy unless the country is committed to forever being at the bottom of the economic ladder.
- The alternative to expanding software capacity domestically is to buy the software that industry and government needs from offshore suppliers. While no country or major industry can afford to rely solely on foreign-supplied software, offshore suppliers do play an important role: 1) they force domestic systems to be at (or at least to recognize) the state of the art in terms of base-line technology; 2) they can undertake projects that must be done very quickly when domestic sources are unavailable; and 3) they can function as learning and investment resources through alliances with domestics companies.
- The prestige of software careers is directly affected by the IS departments and services firms that work on domestic projects, both social and commercial. It is the prestige of the available careers that draws talented young people into the software industry, which in turn is the key to continued development of software capacity.
- As the Irish learned, innovative technical ideas often come from software workers in domestic industries. In turn, the export industry grows out of the domestic industry. And vice versa, since the export industry needs a domestic market to experiment with new ideas, test products, and serve as reference sites.
- It is important not to lose sight of the potential impact of software exports. National strategies must balance export potential with internal growth or both will be impaired. Software continues to be a high-growth industry compared to most industries in either manufacturing or services sectors. In fact, it is hard to imagine another industry with this kind of potential that is as open to new entrants with limited resources. The industry is particularly attractive for emerging economies because it:
  - Continues to offer opportunities to new entrants in a growing world market;
  - Does not involve massive investment in fixed assets (although it does involve serious business investment and risk);
  - Encourages entrepreneurship and new business creation;
  - Can generate very high productivity and value added per skilled worker;
  - Has beneficial effects on existing industries (agriculture, tourism, trade, finance, etc.), improves governmental efficiency and effectiveness, and
  - Is environmentally friendly and sustainable.

10.5. What's The Government's Role?

Governments can play several roles in support of the development of software export and in the application and diffusion of software or ICT in priority sectors of the economy: providing the necessary policy and regulatory environment for telecommunications and Internet infrastructure development; targeting investment in priority software education and ICT skills; promoting ICT literacy; investing in e-government projects; adopting competitive outsourcing of software and ICT support services for public sector modernization; and partnering with the private sector to promote exports, adopt quality

assurance standards, promote venture capital, and invest in relevant research and development.

The range of government roles is expanding and lessons of relevance to developing countries are accumulating, although much more systematic evaluation of various programs in this emerging field is needed.

Experience suggest the following broad principles or best practices in establishing a national software strategy:

- The government's role is primarily about providing an enabling environment through supportive regulations and strategic investment and promotional programs. Direct governmental intervention most often produces unsatisfactory results. If these top-down technology initiatives do not fail outright then they often end up successful in form only, with far less private creation of innovation or new business than would be anticipated based on the level of government expenditure.
- It is best if government sees its role as complementing what the market is doing, and should withdraw from incentive and investment programs on a pre-determined time-frame, to give private sector entities a chance to emerge or a new market to develop. For example, five years after the Israeli Yozma program was implemented to create an indigenous venture capital industry, its goal was achieved and it was privatized.
- To reduce risk, strategy decisions must involve people with deep knowledge of the industry. Political and social objectives must be tempered by technical and market realities. Risks of different kinds must be addressed for each strategic alternative, including the risk of doing nothing at all.
- Although national prestige is not often an explicit goal of government policy, it should be. Successful software strategies have done wonders for Ireland, Bangalore, and Andhra Pradesh in a matter of a decade or so. This success can then be turned into the energy and political will for even greater achievements.
- Finally, expectations must be managed. Metrics must be appropriate. A national project whose main goal is development of software capacity (e.g., through R&D in some hot new area) should not be judged a failure if it achieves its primary goal, but fails to also result in export revenues, for example.

10.6. What are the Main Elements of a Software Industry's Strategy?

Many elements of the software industry's development will happen through private initiative. Some industry problems, however, require policy and regulatory reforms or investments in human resources and other requirements, because the market forces are too weak or too slow to meet urgent development priorities. Government action can involve reforming policies and eliminating regulatory impediments (labor, trade, finance, customs), creating or enforcing needed regulations (telecommunications, e-commerce laws, intellectual property protection); and providing long-term investment (infrastructure, research funding), direct investment (seed funds, export promotion), tax incentives, and, of course, expenditures for government automation and electronic delivery of public services.

The following are the seven key elements of a Serbian Software Industry's development strategy that has to be developed:

- Developing the telecommunication infrastructure
- Developing the domestic market for software
- Developing human resources
- Inducing innovation and creating a supportive habitat
- Stimulating new business creation and finance
- Supporting software exports
- Mobilizing the expatriate community

The software industry is defined broadly to include technology licensing, and specialized software industry support firms, as well as ICT-enabled industries, such as call centers and outsourced clerical and professional services. The impact of software cuts across all sectors, and the progress of other sectors will, in turn, spur further growth of the software industry. Strength in software (i.e., both knowledgeable software professionals and a software-literate workforce) has become an important factor in foreign direct investment. It is also now a major component of modern industrial and commercial infrastructure and government administration. Finally, software is the implementation vehicle for major social programs such as distance learning, telemedicine, and on-line cultural offerings.

While the creation of effective software industry support policies is complicated by this broad ranging impact on business, government and the public, the bottom line is that support for the software industry in any developing country is likely to be an integral component of any social and economic development agenda. Every country has to meet a new minimum “knowledge standard” that includes a software-literate workforce, and enough of a software industry to make the country a credible participant in the global knowledge-driven economy.

11. MONITORING AND EVALUATION

11.1. Introduction

Continuous monitoring an evaluation of the information society development also represents an important part of the sustainability. Two different types of monitoring and evaluation are in question: 1) of the process of implementation of the Strategy and of the Action Plan, and 2) of the information society development in the Republic of Serbia on the whole.

For conducting both types of monitoring and evaluation it is necessary to establish and to define the following:

- Indicators (benchmarking) of the evaluation;
- Methodology for evaluation (to use the methodologies that are applied in other countries);
- Periods of evaluation (annually);
- To authorize an institution which is going to be responsible to consider and to adopt the evaluations and the reports (see section 3.8).

Monitoring the implementation of Serbia's Information Society Development Strategy is in this way a three-stage process:

- Determining the indicators,
- Measurement and analysis,
- Updating the development policy and strategy.

The regular progress reports provides the best basis for adopting new development policies while the indicator system provides a quantitative basis for updating and correcting the strategy objectives and goals. The implementation of these measures in Serbia commences immediately after the adoption of the Strategy.

11.2. Benchmarking

Benchmarking activity in regards to the development of an Information Society following eEurope and eEurope+ practices has been identified as the key element necessary to help the integration of Serbia and other SEE countries into the ongoing European processes, having in mind that benchmarking activity would have two main objectives:

- Systematic monitoring of information society development for each of SEE countries, and the region as a whole,
- Monitoring the fulfillment of the commitments of the eSEE Agenda by the SEE countries.

There are many possible benchmarking systems, and there are various sets of indicators to consider. The suggestion is that the set of indicators chosen should have certain qualities.

- They need to be based on the findings of national ICT strategies regarding the relevance of indicators.
- They need to be relevant for most of the countries in the region

- They need to be realistic, in the sense they can be implemented
- They need be scalable, having the potential to be used to track progress on regional level.

University of Applied Sciences Solothurn Northwest Switzerland (FHSO) in the context of the IST-26276-SIBIS project ("SIBIS - Statistical Indicators Benchmarking the Information Society") have proposed a set of indicators. Even though SIBIS clearly states that the proposed indicators are more appropriate for developed countries, ICT Sector Status Report for SEE countries recommend this set of indicators as being quite relevant for SEE countries.

LITERATURE:

ESEE. *Agenda for the Development of the Information Society.* Stability Pact. 4 June, 2002

EU. *eEurope 2002: eEurope Benchmarking Report.* Brussels: Commission of the European Communities, 2002

---. *eEurope e 2002: Impacts and Priorities*. Brussels: Commission of the European Communities, 2001

---. *eEurope 2005: Benchmarking Indicators*. Brussels: Commission of the European Communities, 2002

---. *eEurope: An Information Society for All.* Brussels: Commission of the European Communities, 2002

Heeks, Richard. *Lessons for Development from the 'New Economy'.* Institute for Development Policy and Management, University of Manchester, 2000

---. *Understanding E-Governance for Development*. Institute for Development Policy and Management, University of Manchester, 2001

OECD. *Measuring the Information Economy*. Paris: Organization for Economic Co-operation and Development, 2002

UNDP. *Creating a Digital Dynamic: Final Report of the Digital Opportunities Initiative.* New York: UNDP, 2001

World Bank. *Building Knowledge Economies: Opportunities for EU Accession Countries*. Paris: World Bank, 2002

UNDP. *Human Development Report 2001: Making New Technologies Work for Human Development*. New York: 2001

Robin Mansell and Uta When (Editors). *Knowledge societies: Information Technology for Sustainable Development.* UN Commission on Science and technology for Development. New York: 1998

Martin Hilbert and Jorge Katz. *Building Information Society: A Latin American and Caribbean Perspective.* UN Economic Commission for Latin America and the Caribbean. Santiago: 2003

eGovernment in Europe: The State of Affairs, EU, 2003

Challenges for the European Information Society beyond 2005, EU, 2004

eGovernment Beyond 2005 - Modern and Innovative Public Administrations in the 2010 horizon, “CoBrA Recommendations” to the eEurope Advisory Group, EU, 2004

E-Government Strategy: Implementing the President's Management Agenda for E-Government, Executive Office Of The President Office Of Management And Budget, USA, 2002

Rethinking the European ICT Agenda: Ten ICT-breakthroughs for reaching Lisbon goals, Netherlands, The Hague, August 2004

SAGA: Standards and Architectures for e-Government Applications, version 2.0, KBSt-The Federal Government Co-ordination and Advisory Agency for IT, Federal Ministry of the Interior, Germany, December 2003

E-government Strategy – Update, New Zealand, June 2003

The E-Government Strategic Plan (PSAE) 2004-2007, Ministry for the Civil Service, State Reform and Spatial Planning, Office of the Secretary of State for State Reform, France, 2004

An ABC Guide to E-Government in Austria, Federal Chancellery, ICT Strategy Unit, Austria, June 2004

eNorway – Status Report 2004, Norway Ministry of Trade and Indastry, Noraway, 2004.
The national strategy for local e-government, Office of the Deputy Prime Minister, UK, 2002

S. Nešković, B. Lazarević, Koncepcija ostvarenja funkcionalnog i tehnološkog jedinstva IS organa i organizacija SRJ, Savezni zavod za informatiku, 2001

The World Bank *World Development report,* Knowledge for Development, 1999

Turabn, E. *Electronic Commerce- A Managerial Perspective,* Prentice Hall, New Jersey, 2000

UNCTAD*, E-commerce and Development report 2002*, New York and Geneva, 2002

UNCTAD**,** *E-commerce and Development report* 2003, New York and Geneva, 2003

UNCTAD, *Electronic Commerce Strategies for development: The Basic Elements on an Enabling Environment for E-Comm*erce, Expert Meeting, Geneva, 1-12 July 2002

M. Vidas-Bubanja,, The Importance of Information Technology for National economic Development, *Ekonomski anali*, April, 2001 (in Serbian)

Council of the European Union, Commission of the European Communities, *eEurope 2002, An Information Society for All, Action Plan*, Brussels, June, 2000

Commission of the European Communities, *eEurope 2002, Impacts and Priorities,* A Communication to the Spring European Council in Stockholm, 23-24 March 2001

Stability Pact, eSEEurope (eBalkans) Working Group Meeting, *Conclusion of the Chair,* Zagreb, January 2001

eSEEurope, *Report on Work and Planned Action*, Tirana, May 2001

A Survey of eBusiness, *Business Central Europe*, May 2001

eEurope+ 2003, Action Plan, June 2001

eEurope 2005, 21/22 June 2002

UNDP, "*eSEEurope Regional Information and Communications Technologies Sector Status and Usage Report: Building an Information Society for All*", Sarajevo, 2004

UN/ECE *Towards A Knowledge Based Economy*, Yugoslavia, Country Readiness Assessment Report, UN, NY and Geneva, 2002

UN/ECE, National Strategy for Building a Framework for E-Business, Geneva, 2005

Stability Pact, eSEEurope Initaitive, *Guidelines for Creation of National Strategy*, 2003

Declaration of Principles, World Summit on the Information Society, International Telecommunication Union, Geneve, 2003

Council Directive 2001/115/EC of 20.12.2001, OJ L 15 of 17.1.2002

Council Regulation (EC) No 792/2002 of 7.5.2002, OJ L 128 of 15.5.2002 and Council Directive 2002/38/EC of 7.5.2002, OJ L 128 of 15.5.2002

Kaćanski, Aleksandar, *Elektronika u zdravstvu*, Mikro, jul-avgust 2005

Documents of Connecting for Health...A Public-Private Collaborative, Markle Foundation:

Zoë Baird and Carol Diamond, *Making the Connection: Helping Healthcare Providers Collaborate Via Health Information Networks*, May 2005

Linking Health Care Information: Proposed Methods for Improving Care and Protecting Privacy, Working Group on Accurately Linking Information for Health Care Quality and Safety*,* February 2005

The Collaborative Response to the ONCHIT Request for Information, January 2005

Financial, Legal and Organizational Approaches to Achieving Electronic Connectivity in Healthcare, Report by the Working Group on Financial, Organizational and Legal Sustainability of Health Information Exchange*,* October 2004

Dr. Carol Diamond, *Health Information Technology: Improving Quality and Value of Patient Care*, July 2004

Achieving Electronic Connectivity in Healthcare, A Preliminary Roadmap from the Nation's Public and Private-Sector Healthcare Leaders, July 2004

Connecting Americans to Their Healthcare, Final Report of the Working Group on Policies for Electronic Information Sharing Between Doctors and Patients*,* July 2004

Connecting Healthcare in the Information Age, June 2003
- The Steering Group *Key Themes and Guiding Principles*
- The Personal Health Working Group *Final Report*
- The Privacy and Security Working Group *Report and Findings*
- The Data Standards Working Group *Report and Recommendations*
- *Key Findings*
- *Facts and Stats*
- Appendix A - *Clinical Data Exchange Efforts in the United States: An Overview*

Survey on Personal Health Record (PHR) Personal Health Working Group, June 2003

Euro Health Group *Introduction to the Serbia Health Master Plan Database,* September 2003

WEBSITES:

Special Co-ordinator of the Stability Pact for South Eastern Europe
www.stabilitypact.org

Electron South Eastern Europe Initiative
www.eseeinitiative.org

Bridges.org (e-readiness guides)
www.bridges.org

European Commission
www.europa.eu.int/information_society/eeurope/benchmarking/text_en.htm
http://europa.eu.int/information_society/topics/telecoms/regulator y/new_rf/index_en.htm
http://europa.eu.int/information_society/eeurope/index_en.htm
http://ue.eu.int/

OECD ICT portal
www.oecd.org/EN/home/0,,EN-home-13-nodirectorate-no-no--13,00.html

UNDP Regional Support Centre (Europe and the CIS), Bratislava, Slovakia
www.undp.sk
www.ecissurf.org

University of Manchester's eGovernment for Development portal
www.egov4dev.org/topic1.htm

Word Bank
www.developmentgateway.org
www.worldbank.org/wbi/knowledgefordevelopment/
www.infodev.org/index.html

ITU
www.itu.int

South Eastern Europe Telecommunication & Informatics Research Institute (INA)
www.inatelecom.org

South Eastern Europe Conference on Policy and Cooperation in Telecommunications, Belgrade, 28-29 October 2002
www.eseeuropeconference.org

Connecting for Health...A Public-Private Collaborative, Markle Foundation
www.connectingforhealth.org