



**USAID**  
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**Status of  
Information & Communications  
Technology in Serbia:**

**Access, Applications and Opportunities in  
Government, Business and Civil Society**

**ASSESSMENT AND RECOMMENDATIONS**

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# EXECUTIVE SUMMARY

## Objectives and Approach

This Information and Communications Technology (ICT) Assessment is intended to provide USAID/Serbia with an understanding of the status of access to and usage of ICT in the public, commercial and civil society sectors in Serbia. The report utilizes a SWOT analysis (strengths/weaknesses/opportunities/threats) to present the assessment results. Based on those findings, it offers recommendations for key ICT-related initiatives that USAID/Serbia could undertake to leverage its own and other development activities and make a significant, measurable impact across all of the Mission's Strategic Objectives.

## ICT in Serbia Today

### *Overview*

In the area of ICT, Serbia is a land of contradictions. It has lagged behind other countries in the region, with out-dated infrastructure, low levels of Internet use, limited ICT adoption among businesses and NGOs, and a monopoly that severely constrained competition and innovation. Yet recent actions by the Government of Serbia (GOS) signal a shift in policy and attitudes. The Law on Telecommunications eliminated the monopoly and created an independent regulator, RATEL, with the charge to open the market and create a level playing field. The National Investment Plan (NIP),<sup>1</sup> adopted in 2006, envisions extensive ICT-related activities that are intended to improve government services and infrastructure – and even increase transparency and thwart corruption. These are not the only public initiatives. Many municipalities – some extremely innovative – are adopting e-government solutions. All of this government spending is also a powerful driver for the ICT market. Meanwhile, several small but promising ICT software development firms are gaining recognition in the international market. NGOs have avidly adopted computers, some using highly innovative applications. Perhaps the most startling news is that Telekom Serbia, having invested huge sums in infrastructure, is ready to roll out broadband access that will be widely available at highly competitive rates.

But the story does not end there. Telekom Serbia retains power as a de facto monopoly. To meet the challenge, RATEL sorely needs both to build its capacity and, somehow, to find the strength to rise above the political fray. The NIP includes large investments, some of which were initially conceived rather hastily. The dynamic and competitive Internet Service Provider (ISP) industry may be increasingly hobbled as monopoly pressure intensifies. ICT software firms face tough odds, as they struggle to find staff with the current, practical skills they need, while many of the best and the brightest leave the country for more lucrative opportunities. Non-technical educational programs seem not to grasp the fact that ICT skills are essential to all types of enterprises. Most NGOs have difficulty applying ICT strategically. And one survey reports that an unnerving 52% of Internet non-users claim to have no use for the Internet.

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<sup>1</sup> The National Investment Plan applies much of the government's 2006 budget surplus to fund capital investments throughout Serbia, mainly infrastructure.

Projected expenditures are €415 million in 2006 and a cumulative total of €1.674 billion by the end of 2007. However, given the magnitude of the program and delays in starting some of the many projects it encompasses, some of the planned expenditures may roll over into 2008.

In sum, Serbia is poised to take off with widespread, creative uses of ICT to improve governance, expand the economy, and strengthen civil society. Yet to fulfill that potential, every aspect of the ICT sector must grapple with tough challenges. RATEL has to move quickly if an innovative, vibrant competitive market is to emerge and become a major force for economic growth – an opportunity that might well be lost altogether if Telekom Serbia retains its de facto monopoly power until 2010, as is currently envisioned. Small businesses need access to strategic ICT applications that can greatly boost their competitiveness, but few of these firms can afford to make such an investment on their own. Educational institutions with vested interests in the status quo must accept the need for fundamental changes, including tighter links with the business community, to overcome the youth unemployment crisis and meet the workforce demands of a modern market economy. NGOs need better ties to organizations worldwide using ICT strategically to support their common goals. And ordinary Serbians need greater awareness of the advantages ICT can provide in all aspects of their daily lives.

### **Telecommunications Legal and Regulatory Environment**

Serbia's telecommunications legal and regulatory environment is marked by incongruity. On one hand, Serbia has taken important steps toward establishing a legal and regulatory environment that fosters an open and competitive telecom market. Key among them is the Law on Telecommunications, which in principle eliminated the telecom monopoly and created an independent regulator (RATEL). Yet passing laws is only the first step. Although the country's mobile telephony has recently been opened to competition, the same cannot be said of fixed line telephony. The latter remains a de facto monopoly, with Telekom Serbia, majority owned by the GOS (with an 80% share), having virtually uncontested power over phone lines to end-users as well as all access to the international Internet.<sup>2</sup>

If an open telecom market is to become a reality, RATEL must be willing and able to take bold action to fulfill its mandate and adopt key regulations that will curb the power of Telekom Serbia (TS), e.g., ensuring fair access to the TS backbone network and the international Internet, and legalizing the use of voice-over-Internet-protocols (VOIP). To do so, this young agency will need considerable capacity-building – and sufficient political independence – to enable it to address the complex telecom challenges it has inherited. Also needed is greater consolidation within the GOS of the currently fragmented ICT-related activities, to provide more effective leadership and sufficient authority to undertake politically difficult actions.

### **Telecommunications Infrastructure**

Again, the contradictions in Serbia are rife. Voice telephony is widely available, even in rural areas, at prices equal to or well below those of other countries in the region (even for international calls). Dial-up Internet access – while slow and cumbersome – is also relatively cheap and widely available. Mobile telephony, too, is strong, covering more than 90% of the country. Yet, until recently, Serbia has also suffered from one of the poorest infrastructures in the region, impeding Internet access and innovative uses of ICT. Nor has wireless broadband filled

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<sup>2</sup> Serbian ISPs can create (or use) non-Telekom Serbia networks to send email, create Websites, etc. within Serbia. However, only two companies have licensed networks that cross an international border, and therefore have links to the "International Internet": Telekom Serbia and VeratNet.

the gap, as it has in other countries – primarily, it appears, due to Telekom Serbia’s actions to control or repress the development of wide area wireless networks.

Yet major change is imminent. Telekom Serbia has undertaken enormous investments to upgrade the backbone infrastructure and make it broadband-ready. Soon, ADSL broadband will be widely available across Serbia at extremely competitive prices. Utilization of the Internet could take off if RATEL seizes the opportunity to open competition – by ensuring fair access to Telekom Serbia’s modernized network, enabling independent access to the international Internet, and legalizing VOIP. Several of Serbia’s ISPs are ready and willing to compete vigorously. Meanwhile, mobile phone companies may join the fray, offering mobile broadband services to their customers. Hence, with the right regulatory environment accompanying these recent infrastructure advances, demand for the Internet and ICT could skyrocket.

### **ICT Industry**

Despite the constraints they face, Serbia’s ISPs have created the epitome of a vibrant, competitive market. More than 50 ISPs vie for customers, and although most are in Belgrade, many also serve other, including more rural, areas. Moreover, two ISPs have risked developing infrastructure linking to the international Internet independent of Telekom Serbia. Cable companies and mobile phone operators are also positioning themselves to go up against Telekom Serbia in the broadband market.

Perhaps the most impressive news comes from Serbia’s software development industry. These small but thriving companies have taken advantage of their technical prowess, English language facility, and proximity to and common culture with the EU, to begin to carve out high value-added niches in the European market.<sup>3</sup> The presence of major international ICT corporations has helped. Many of them partner with local firms, who gain the benefit of cutting-edge technology and expertise, along with an entrée to the global market. The strong government demand for e-government applications at both the central and local levels also helps drive the industry’s growth. With the right support, these companies could develop ICT applications for Serbia’s non-ICT industries that will generate broad economic expansion and job growth.

Yet we should not be overly optimistic. Serbian ICT companies have crucial needs. They require stronger management, sales and marketing skills. Educational institutions must link more closely with the private sector, in order to respond to workforce needs, e.g., technical programs providing more practical experience; non-technical programs integrating relevant ICT. The problem bedeviling other developing markets – “brain drain” – is also a serious threat to the Serbian ICT industry’s future. Finally, the country needs more “good press” to attract investment and counter internationally held stereotypes rooted in the Milosevic era.

### **The Commercial, Government and Civil Society Market for ICT**

Serbia’s market for ICT is at a crossroads. The track record is, by and large, discouraging. A weak infrastructure has smothered overall demand for the Internet. A mere quarter of the population uses the Internet in any way. Serbian businesses, struggling to survive, lack the financial wherewithal, knowledge and skill to adopt the ICTs they need to compete in higher

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<sup>3</sup> USAID has provided key assistance to a number of these companies through its Serbia Economic Development Project (SEDP).

value-added sectors. Most NGOs have computers but not the ability to use them strategically to support their goals. ICT companies confront the challenge of being late comers to the international market.

The situation would be bleak were it not for some key shifts and an underlying market strength – albeit more latent than realized thus far. First, overall public demand for Internet access is rather impressive, given the constraints faced by the general population: slow connections, low income, high unemployment, not to mention residual effects of war devastation. The 24% Internet penetration among the populace, 41% among households, matches some countries where access has been far easier and more actively promoted. Although one survey of future Internet adoption delivered disturbing results, another offers a quite optimistic forecast, so all generalizations must be cautious.

For Serbia’s software development industry, the future is promising. The EU offers a growing, nearby market. Government ICT adoption is on the rise. NGOs are eager adopters, mainly needing fuller information about strategic applications. For businesses, especially SMEs, better access to ICT applications that improve competitiveness, combined with a demonstration effect from a few early adopters, could drastically boost ICT utilization and fuel economic growth in a “virtuous cycle.” The prospects are particularly favorable for certain major industries such as agriculture.

Thus, Serbia’s market for ICT appears to be on the brink...of either rapid and innovative ICT expansion in a growing economy, or else stagnation and a continuous game of “catch up.” The direction will be heavily influenced by some key factors: deciding when and how to open up a competitive telecom market; providing strategic assistance to give SMEs affordable access to ICT applications that can yield demonstrable bottom-line results; strengthening of key workforce skills both for ICT and non-ICT companies, along with better links between business and educational communities; expanding NGOs’ knowledge of innovative ICT practices worldwide.

## **Recommendations**

In the course of conducting the ICT assessment, many opportunities emerged for assisting Serbia to increase access to and value-added use of ICT. Furthermore, the team concluded that Serbia is finally poised to “take off” in the ICT area, and strategic interventions could spell the difference between success or stagnation. This report focuses on just a few key, strategic, ICT-related activities that USAID/Serbia could undertake to have a significant, measurable impact across all of the Mission’s Strategic Objectives.

The recommended activities have synergies with each other, so would gain power as integral components of one overall program. However, each of the recommended activities – or any element of a particular activity -- could also have a major impact as a component of a larger program that is already underway or in planning. The team recommends the following four overarching components, each of which includes several activities, for Mission consideration:

### **1. Leverage planned government investments and donor assistance.**

Leveraging other development efforts gives USAID an important and often cost-effective way to make a significant contribution. The Government of Serbia’s National Investment Plan (NIP) is a prime candidate, as it includes substantial ICT-related investments. There is an opportunity to add value and contribute to the success of these initiatives by providing high-level technical assistance during the substantive design, planning and implementation

phases.<sup>4</sup> Where NIP initiatives may face political resistance, e.g., those involving improved transparency, USAID support could be particularly helpful. USAID can also make a key contribution through involvement in other ICT-related initiatives. For example, the GOS is partnering with a number of donors to create business incubators. The incubators could be greatly strengthened by USAID initiatives drawing on the successes of relevant USAID projects in other countries.

## **2. Support local efforts to improve the market environment for ICT development**

The importance of ICT development in Serbia, and the benefits to be gained, have not gone unrecognized in the local community. However, much remains to be done to realize ICT's full potential. USAID could lend significant support to efforts to open the telecommunications/Internet market to full competition in a number of ways, e.g., public recognition, financial support, capacity-building, facilitating networking within Serbia and internationally. In addition, USAID can help increase understanding of the stakes, by creating awareness-raising components within projects that serve non-ICT businesses, educational institutions, NGOs, and the public. Through linking with public diplomacy efforts, the mission can help make open market principles more concrete for businesses and the public by providing "success stories" of USAID support for a competitive environment and innovative uses of ICT.

## **3. Support access to sector-specific high impact ICT applications that significantly improve competitiveness in an industry sector or the capacity of target NGOs.**

### **SME Competitiveness**

This type of activity uses high impact ICT applications to quickly and significantly improve the competitiveness of an industry. Most importantly, it provides all SMEs in an industry with affordable access a sustainable basis to those ICT applications, which individually they probably could not afford. There are two key steps involved:

- Analysis of an industry to identify an ICT-enabled application that has the potential to boost the competitiveness of the entire industry. The industry may include all or a subset of the sectors the mission has selected for its competitiveness programs.
- Development of a sustainable means for the SMEs in the selected industry to have access to the ICT-enabled application.

There are various approaches to doing this. One approach is to have a USAID program co-invest with local entrepreneurs to create a sustainable for-profit or not-for-profit enterprise that offers access to the ICT-enabled application at affordable prices to all SME's in the industry. Assistance will also be needed to ensure that the enterprise that offering the service has a sound business plan, covering sales, marketing and operations, and implements a viable revenue model that will underpin sustainability. Another approach is to look within the value chain for existing enterprises that will "win" if the SMEs can use the proposed ICT-enabled application and so may be willing to finance its acquisition and provide the service at a reasonable cost. For example, a large wholesale buyer may need to have a reliable source

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<sup>4</sup> USAID is already engaged in such assistance under its Serbia Economic Growth Activity (SEGA).

of high quality products from the SMEs in order to meet stringent delivery schedules. This buyer may be willing to invest in and provide the SMEs access to ICT-enabled planning, production or supply chain management tools to facilitate their fulfilling the buyer's needs.

### **NGO Capacity**

Along similar lines, USAID/Serbia can add an innovative approach to using high impact ICTs by applying them to strengthen NGOs. Such activities would involve two key steps:

- Identifying an ICT application that can *quickly* and *significantly* improve the reach and impact of NGOs working in a selected area
- Providing *all target NGOs* with affordable access to the application through a service provider that has with a strong business plan that supports long-term sustainability.

#### **4. Support access to ICT applications that improve competitiveness across sectors and/or across USAID Strategic Objectives (SOs).**

This component utilizes the power of high impact ICT applications to make major improvements across industry sectors or SOs. The steps are similar to those in Activity #3, except in this case the first step is identifying ICTs that can quickly and significantly address major gaps across industries or sectors, including education, business, civil society. The next step is facilitating development of for-profit or not-for-profit enterprises/NGOs that can close the gaps by offering high impact applications at affordable prices to all businesses/organizations/users in the target group (see example below). Each of these "ICT-enabled" entities receives hands-on technical assistance to ensure it can implement a viable business plan that will yield long-term sustainability, and its performance is monitored to see whether it is achieving the planned objectives.

***Example: An ICT-Enabled Center for Youth Employment.***

This Center aims to open new, higher value-added job opportunities for youth as well as to build a workforce with skills that Serbian SMEs need to be competitive. It uses ICT to provide a one-stop-shop center with a range of services open to youth, the unemployed, and those seeking to raise their skill level, e.g., information on training sources, job opportunities and requirements; job-seeking assistance; business H/R development services – all in partnership with training/educational institutions and private sector sponsors. Through the Center, youth and unemployed can use job or training referral databases that are sponsored by businesses; fee-for-service offerings, such as career counseling, e-mentoring (with fees on a sliding scale); a range of online information sources. Companies can use fee-based services such as "head hunting" and business match-making. Universities, secondary schools and government agencies can use websites and other fee-based services that disseminate information about their offerings.

## 1.0 Introduction

### 1.1 BACKGROUND

Serbia is at a crucial period in its transition to an open, democratic state with a well-functioning market economy, following the devastating conflicts of the Milosevic era and the collapse of the socialist economy. The country has made substantial progress in developing the necessary legal and economic measures, but continues to face a wide range of problems, including persistent unemployment and GDP below 1989 levels. USAID's multi-year strategy, effective from FY 2006 through the scheduled end of USAID assistance to Serbia after 2012, adopts an innovative approach that integrates key economic growth and democracy components and is designed to respond to changes in the socio-political environment.

Access to and application of information and communications technology (ICT) in Serbian public and private sectors can serve as both key levers and barometers of the country's progress. ICT can help drive economic growth – both via a promising ICT industry and as a means to modernize and add value to non-ICT sectors. It offers a tool for developing the workforce capacity Serbia needs to compete in the world economy. ICT can also help to improve governance, with greater transparency and responsiveness to citizens' needs. Yet these opportunities are linked to difficult challenges for every sector. Meeting the challenges can unleash tremendous innovation and growth. Failing to do so could hobble all other efforts to expand economic growth, improve governance, and strengthen civil society.

### 1.2 OBJECTIVES AND APPROACH

This ICT assessment was requested by USAID/Serbia, which recognized the importance of ICT to both economic growth and good governance. USAID activities underway or planned incorporate a number of ICT elements, including integrated management information systems for building institutional capacity, Internet tools and websites for broadening the market for Serbian products, and case management recording and reporting systems for improving the efficiency and transparency of the judicial process. In addition, a component of one project focuses on development of the ICT business sector. Although these activities are extremely valuable, they generally focus on addressing ICT needs of a particular sector or institution.

In contrast, this assessment aims to provide the mission with a comprehensive, multi-faceted picture of ICT in Serbia, as well as to identify opportunities to use ICT as a powerful force for enhancing the competitiveness of Serbia's industries, improving government responsiveness and transparency, and expanding the reach and impact of NGOs seeking to address social equity and public welfare needs.

To accomplish this, the assessment considered various perspectives:

- the legal and regulatory environment, particularly its effectiveness in promoting competition while protecting the public interest;
- the status of the ICT sector and the ICT infrastructure, including ease of access to ICT technology for public and private purposes; and
- the development potential of the business, government and civil society market for ICT.

Drawing from the assessment results, the report offers a series of recommendations for high priority ICT-related activities that could boost government effectiveness and accountability, grow the ICT industry and strengthen competitiveness of non-ICT industries, improve workforce development and expand job opportunities, and address social issues and inequities. Ultimately, the report endeavors to contribute to the mission's goal to help position Serbia to be a prosperous, democratic and competitive nation by the time USAID assistance to Serbia reaches its scheduled end after 2012.

The assessment was conducted by Janice Brodman (EDC) ([jbroadman@edc.org](mailto:jbroadman@edc.org)) and Judith Payne (USAID/EGAT/EIT/IT) ([jpayne@usaid.gov](mailto:jpayne@usaid.gov)), with the participation of and support from the Center for Internet Development (<http://www.netcentar.org>), an NGO in Serbia. The approach involved four major steps:

1. The team first reviewed a wide range of materials, including ICT-related reports; USAID project documents, data and plans; reports on economic and governance conditions; analyses of various sectors; and news articles.
2. In Serbia, the team conducted interviews with USAID staff and project teams, other donors, owners and employees of Serbian ICT and non-ICT businesses, members of educational institutions, staff of NGOs, and national and local government officials, during the period October 30 to November 15, 2006.
3. The assessment team analyzed the information gathered by conducting a SWOT analysis, identifying Serbia's strengths, weaknesses, opportunities, and threats regarding the use of ICT to promote economic growth and democratic governance.
4. Drawing from the SWOT analysis, along with experience of other countries, the team identified strategic opportunities for using ICT to deliver major, positive, measurable impacts on economic growth and transparent democratic governance that would build on the mission's current and planned activities, and leverage efforts of the Government of Serbia (GOS), municipalities, other donors, private sector, and NGO's.

Section II of the report examines four key aspects of ICT in Serbia today:

- A. Telecommunications Legal and Regulatory Environment;
- B. The Telecommunications Infrastructure;
- C. The ICT Industry; and
- D. The Commercial, Government, and Civil Society Market for ICT.

Each sub-section is examined through a SWOT analysis lens, i.e., by examining the strengths, weaknesses, opportunities and threats related to each sub-section. Chart 1, in Annex A, provides a summary of the SWOT analysis results across sectors.

The final section, III, provides ICT-related recommendations resulting from the analysis.

## 2.0 ICT in Serbia Today

This section provides a comprehensive overview of access to and use of ICT in Serbia today. It examines four major aspects:

- A. Telecommunications Legal and Regulatory Environment;
- B. The Telecommunications Infrastructure
- C. the ICT Industry
- D. The Commercial, Government, and Civil Society Market for ICT.

### 2.1 TELECOM LEGAL AND REGULATORY ENVIRONMENT

#### Overview

Serbia's telecommunications legal and regulatory environment is marked by contradictions. On one hand, Serbia has taken important steps toward establishing a framework of laws and regulations that foster an open and competitive telecom market. Key among these is the Law on Telecommunications, which provided for elimination of the telecom monopoly and creation of an independent regulatory agency (RATEL). Yet passing laws is only the first step. Although the country's mobile telephony is quite open and competitive, the same cannot be said of fixed line telephony. The latter remains a de facto monopoly, with Telekom Serbia, 80% owned by the GOS, having virtually uncontested power over fixed line telephony and all access to the international Internet.

If an open telecom market is to become a reality, RATEL must be willing and able to take the bold actions needed to fulfill its mandate, by adopting and implementing regulations that will curb the power of Telekom Serbia. Most importantly, RATEL must ensure fair utilization of Telekom Serbia's modernized network, enable independent access to the international Internet, and legalize voice-over-Internet-protocols (VOIP). To meet the complex challenges it has inherited, this young agency will need considerable capacity-building. It must also build sufficient independence from political influence.

Also sorely needed is a central authority within the GOS to consolidate, coordinate and provide leadership for ICT-related activities. Such an authority could provide consistency and quality control for ICT initiatives, such as those in the National Investment Plan. Properly positioned, it could have the power to take politically difficult actions.

The following sub-sections provide the SWOT analysis of the telecom legal and regulatory environment in detail.

Telecom Legal and Regulatory Environment	
<b>Strengths</b> <ul style="list-style-type: none"> <li>• Good ICT-related laws</li> <li>• Independent regulator</li> <li>• Private sector pressure for an open market</li> </ul>	<b>Weaknesses</b> <ul style="list-style-type: none"> <li>• RATEL needs strengthening</li> <li>• No central ICT authority</li> <li>• Problematic government investments</li> </ul>
<b>Opportunities</b> <ul style="list-style-type: none"> <li>• RATEL can open the market</li> <li>• Eager and competent competitors</li> <li>• National Investment Plan</li> </ul>	<b>Threats</b> <ul style="list-style-type: none"> <li>• RATEL fails to open the market</li> </ul>

### 2.1.1 Telecom Environment Strengths

**Good ICT-related laws.** During the past few years, Serbia has passed several laws that serve as important steps toward creating a positive environment for ICT development and access.<sup>5</sup> Among the most important is the Law on Telecommunications (April 2003), which aims to make the Serbian legal and regulatory environment compliant with EU standards. The law addresses a number of key issues: it eliminates the incumbent telecommunication company monopoly, as of June 2005, and requires the dominant market player, Telekom Serbia, to meet all reasonable requests for network access, provide service in a non-discriminatory and transparent manner, and provide a cost-oriented pricing structure.<sup>6</sup> It also assigns responsibility for developing a telecommunications strategy to the Ministry of Capital Investments, and responsibility for implementing the strategy and regulating the market to the Republic Telecommunications Agency (RATEL).

Another important law is the new Copyright Law, which complies with EU recommendations and WTO requirements on intellectual property rights (TRIPS). The major challenge is to enforce the law. A positive sign is that Microsoft and the international business association of software producers for the protection of intellectual property (BSA) both give give Serbia high marks in legalizing software. Nonetheless, informal reports continue to cite a lively business in illegal software, DVDs and CDs.

While allowing Telekom Serbia, which is 80% state-owned, to retain a de facto monopoly on fixed telephony, the GOS has fostered a relatively competitive environment in mobile telephony through privatization and sale of three operating licenses by competitive tender during the latter half of 2006 (two of the licenses went to foreign investors, with the third awarded to a Telekom Serbia subsidiary).<sup>7</sup> As a result, there is greater market responsiveness and innovation in the area of mobile telephony (see Section III.A.1. Infrastructure – Strengths).

**Independent regulator.** RATEL began operations in December 2005, with the legal power and the responsibility to foster an open, unbiased, liberalized market that supports expansion of new telecommunications technologies. It has broad authority in key areas: assigning numbers, regulating pricing structures, regulating connection between operators, developing rules on VOIP, arranging for universal service, providing access to the Telekom Serbia backbone network, and managing the use of spectrum for wireless telecommunications services. Having a regulator that is an independent legal entity and self-financing is a strength in itself. If RATEL carries out its responsibilities free of political influence, it can create a telecommunications sector that is a cornerstone for a liberalized market, ensuring open competition, equal pricing for

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<sup>5</sup> In addition to the laws discussed in the body of the paper, the following important laws have been passed:

- Copyright and Related Rights Law
- Electronic Signature Law
- Protection of consumers
- Access to information
- Amended Criminal Code (which addresses some aspects of cyber crime)

<sup>6</sup> Telecommunications Law, Articles 9, 10, 39, 40, 43, 48, 52 and 111.

<sup>7</sup> There are three licensed mobile providers: Telekom Serbia's MTS (49% owned by government), Telenor and the most recently licensed provider, Mobilkom, owned by the Austrian mobile operator.

interconnectivity and access to essential infrastructure, and a fair and transparent regulatory environment.<sup>8</sup>

**Private sector pressure for an open market.** Private sector actions may further strengthen implementation of the Telecommunications Law. Some NGOs and businesses are pressing steadily for a more competitive telecommunications environment.<sup>9</sup> These pressures are about to increase, as some members of the American Chamber of Commerce seek to establish a committee of influential businesses (including firms in the ICT sector and those using ICT in other sectors) committed to advocating for the government to open up telecommunications competition.

### 2.1.2 Telecom Environment Weaknesses

**RATEL needs strengthening.** The telecom environment also has important weaknesses. First, the new regulatory agency, RATEL, needs considerable strengthening. It is clear that there are strong political pressures that could constrain RATEL's effectiveness. Just by way of example, the members of its Managing Board were appointed by the Government without public consultation, making RATEL vulnerable to accusations that its decisions will be politically influenced. In order to take the necessary steps to open competition in the telecom industry, RATEL will have to address a number of complex issues in a short timeframe, some raising significant political concerns. To act effectively, the agency needs considerable human capacity development, in a context free of political interference .

Despite the new telecommunications law and regulatory environment, Telekom Serbia (TS) continues to be the de facto monopoly of public voice telephony and the fixed line network for phone services and access to the international Internet. TS has the only Internet and data backbone in Serbia; all ISPs (save one) and mobile phone companies must access the international Internet and landline phones through TS's backbone.<sup>10</sup> At the time of this report, neither the telecommunications law nor the Regulatory Agency had fully addressed some important issues, e.g., local loop unbundling and the legal status of VOIP.<sup>11</sup> There are no plans to offer additional licenses for fixed telephony and fully open the telecom market until 2010. Moreover, there are reports of predatory practices by TS, such as cutting the lines of cable operators and attracting prominent companies and embassies through below-market pricing. The government, as majority owner of TS (with an 80% equity share), appears to have little incentive to displace TS's monopoly position.

The National Information Society Strategy raises further questions regarding government's commitment to an open market. The IS Strategy was to have been developed through a multi-stakeholder strategy but appears to have actually engaged a relatively limited set of participants. The strategy does not propose specific actions to be taken to liberalize the telecommunications

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<sup>8</sup> Under the new Telecom law, it is illegal for RATEL to have a conflict of interest with the telecom entities it is regulating.

<sup>9</sup> One NGO is the Center for Internet Development, which provided valuable support for this report.

<sup>10</sup> VeratNet also has a cross-border link to the international Internet and a distribution backbone; however, their network is far more limited than that of Telekom Serbia, in terms of geographic coverage and in total bandwidth.

<sup>11</sup> The "local loops" of a telephony network connect users to the network. They are key because they are expensive to build, were usually built with public funds, and provide the incumbent with a huge competitive advantage. Providers other than Telekom Serbia must have fair access to TS's local loop facilities if there is to be true competition.

Furthermore, competitive access to local loops is essential to increasing broadband access. "Local loop unbundling" is the means for ensuring that alternative providers have fair and non-discriminatory access to the local loop facilities. There are other areas of weakness as well, e.g., the law provides for number portability, but requires specific guidelines from RATEL.

industry, although it does describe the various issues and identify areas where action would be worthwhile. These deficiencies raise questions regarding the Government of Serbia's willingness to take the essential next steps in liberalizing and opening the telecommunications market to competition. Broader political conditions also undermine confidence that there is the political will needed for change, e.g., Serbia ranked 97<sup>th</sup> on Transparency International's 2005 Corruption Perceptions Index<sup>12</sup>.

**Lack of centralized ICT authority.** Another weakness relates to the lack of a single government unit responsible for ICT matters. Functions related to ICT are currently fragmented among a number of lower-level GOS agencies and departments. A central authority that consolidates and coordinates all ICT functions could provide the high level leadership needed to tackle the obstacles to ICT growth and promote the use of ICT to support development goals.

### 2.1.3 Telecom Environment Opportunities

Opening competition in the telecommunications sector can be expected to result in a range of benefits. For example, telecommunications is crucial to business competitiveness, and a more open and competitive telecom environment usually offers business (and residential) customers new services more quickly and at lower cost than a monopoly structure. More jobs have been created in countries with open and competitive telecoms environments than in those with monopolistic environments.<sup>13</sup>

**RATEL can open the market.** The Regulatory Agency, RATEL, offers a key opportunity for Serbia to create the kind of legal and regulatory environment that would promote competition. For this to occur, the Agency must pass rules that either open Telekom Serbia to direct competition or, at least, prevent TS from abusing its dominant position.<sup>14</sup> Key rules relate to:

- Regulating interconnection tariffs, which protects the right of all providers – Internet service providers (ISPs), mobile and traditional phone providers – to be connected to the fiber backbone and have access to a gateway to the International Internet, at reasonable cost (i.e., based on the principles of cost-oriented billing).<sup>15</sup> It is important to ensure that TS's interconnection rates enable other providers to compete, while offering affordable prices to retail users.
- Licensing other ISPs to provide access to the International Internet, which would enable them to serve Internet users without relying on TS's network.
- Unbundling Access to Local Loop,<sup>16</sup> which enables telecommunications providers to use TS's network to provide services. Unbundling the local loop would make true competition possible, fostering innovation among competitors.

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12 [http://www1.transparency.org/cpi/2005/cpi2005\\_infocus.html](http://www1.transparency.org/cpi/2005/cpi2005_infocus.html)

13 Report 2 – Country Comparative Report, Supply of services in monitoring of South East Europe - telecommunications services sector and related aspects, May 22, 2006.

Prepared by Cullen international (<http://www.cullen-international.com>)

14 The EU has guidelines that aim to protect the other operators in a monopoly situation, e.g., rules about non-discrimination, cost structure and transparency. In Serbia, RATEL has the power to set and enforce such rules.

15 Training for RATEL from the US Trade and Development Agency (TDA) is focusing on this issue, i.e., reform of the fixed phone network tariff to provide interconnection services to Telecom Serbia's competitors at fair prices.

16 Footnote 5 provides an explanation of local loop unbundling.

- Legalizing Voice Over Internet Protocols (VOIP), which would enable ISPs to offer VOIP, both lowering the cost of international calls and supporting a more competitive environment for telecom/Internet services. Currently, VOIP is unregulated; however, it is considered to be legal only for business internal use (although some ISPs offer VOIP services) and is obstructed by Telekom Serbia.<sup>17</sup>
- Numbering and Addressing, which would allow customers to select their provider without concern that they will lose their phone number.

Experts providing training to RATEL appear to be optimistic that the Agency will eventually be able to fulfill its responsibilities related to these issues. They find the RATEL staff committed to fostering a liberalized, competitive environment, and the Agency management competent and willing to take the steps necessary to support liberalization.<sup>18</sup> They also recognize, however, that RATEL has considerable needs for capacity building, that the issues are complex and that RATEL will need time to address them.

**Eager and competent competitors.** The opportunity for a competitive telecommunications sector lies not only with the regulator, but with the rest of the telecommunications market as well. In this regard, Serbia is well positioned. Unlike some other countries in the region, Serbia can boast of several telecom/Internet providers ready and able to compete with Telekom Serbia if the market opens. As mentioned above, TS has the only Internet and data backbone in Serbia, which ISPs and mobile phone companies must use to access the international Internet and landline phones. However the alternative providers already have solid experience operating networks (which link to the international Internet and/or to local phones via TS), and thus could prove to be viable competitors.

**National Investment Plan.** Another opportunity lies with the National Investment Plan (NIP). Although the NIP suffers from some weaknesses, as described above, such major investments in ICT also offer key opportunities. Some are evident. For example, the plan includes a project to network all government Ministries, and eventually all public sector institutions, including schools, health organizations and local governments.<sup>19</sup> Such a network would obviously expand Internet access considerably. It could even deploy its excess capacity as a means to provide affordable broadband outside government, e.g., to companies and NGOs.

***The NIP could also be used to pry open telecom competition***

**Option 1:** the plan to link all government institutions currently expects to use the Telekom Serbia fixed line network, plus the networks of the three mobile providers and perhaps, in more outlying areas, the wireless broadband providers. **If** RATEL passes rules to liberalize the market, **and** the government is interested in opening competition, a tender for the government network could be structured to attract bids from international investors, which could partner with local telecom companies and compete effectively with Telekom Serbia. The tender could also require plans to market affordable services to the businesses and communities and ensure service to currently underserved, non-urban areas.

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<sup>17</sup> ISPs report that if they terminate VOIP calls to a landline, TS cuts the line or blocks the ISP's dial-out capabilities.

<sup>18</sup> Based on conversations with the trainers, who are training RATEL under a TDA activity.

<sup>19</sup> The project will be headed by the Ministry of Science and Ecology, with other ministries and agencies participating, including the Agency for Information Technology and the Internet.

### ***Using NIP to open telecom competition***

**Option 2:** Another strategy would license EPS (the government-owned electric company) to provide access to the international Internet by using excess capacity in its fiber network to offer wholesale services to ISPs, thereby becoming an alternative to TS's backbone. If VOIP were legalized, such a network could also provide voice service and be quite competitive. Although this option would only result in two, rather than one, government-owned, first-level ISPs providing direct links to the international Internet (the second-level ISPs buying the access from TS or EPS), it nonetheless would create greater competitive pressures and the attendant benefits. In other countries, competition to monopoly telephony from entities such as energy companies has had significant impact on prices and services.

## **2.1.4 Telecom Environment Threats**

**RATEL fails to open the market.** The most evident threat to an open, competitive telecommunications industry lies in further entrenchment of the monopoly provider. Experience suggests that this type of power stifles innovation and rapid service improvements. Yet RATEL faces a knotty problem. The public enjoys certain benefits due to the monopoly structure. Unlike some monopolies (e.g., the former monopoly in Macedonia), TS does not use extreme price gouging to raise revenues while neglecting its infrastructure. On the contrary, TS is actively investing in improving its infrastructure and its pricing (tariff structures) is on par – even low – in comparison with other South East Europe (SEE) countries.<sup>20</sup> As a result, TS operates at a much lower margin than most telecommunications companies.<sup>21</sup>

On the other hand, discussions with other companies in the industry reveal TS's very real ability to remove competition for all practical purposes. Its pricing structure gives TS an unfair competitive advantage, as non-government owned companies cannot compete with negative margins! Moreover, the Assessment team found that virtually every potential competitor to TS is dependent on the TS-controlled network, and all expressed fear of displeasing the monopoly power. Thus, the problem is not only TS's de facto monopoly power, but its use of that power to control and restrain the business decisions of potential competitors. For example, the team heard numerous stories of ISPs, other telecommunications providers or media outlets receiving veiled threats or outright action if they criticized TS (e.g., lines would be cut, access blocked, advertising dropped, etc.). Even the Presidency of the ISP Association putatively was given to a very small "second tier" ISP that did not buy access directly from TS, because only that company felt it was safe to head up the Association.

Thus, the situation is complicated. Telekom Serbia has kept basic telephony costs very low – in some cases below cost. They plan the same with ADSL, a flat fee across the country, including areas outside larger cities. At the same time, they use their de facto monopoly position to stifle innovation and market responsiveness among other companies.

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20 Report 2 – Country Comparative Report: Supply of services in monitoring of South East Europe - telecommunications services sector and related aspects, May 22, 2006. Cullen Report. <http://www.cullen-international.com>

See Section III. ICT Sector Weaknesses for further details regarding TS pricing.

21 One way to compare telecom operators is using "Earnings Before Interest, Taxes, Depreciation and Amortization" margin (EBITDA/sales). The normal range is 30-50%. For Telecom Serbia it is 17.90%.

Hence, although it is important for RATEL to move quickly to open the telecommunications market, including instituting tariff restructuring,<sup>22</sup> the result is likely to raise the cost of basic phone calls, and perhaps of ADSL. Thus, it will be incumbent upon RATEL to ensure that the poor have access to affordable telephony. They must also be careful to open access to the digitized network to TS competitors in such a way as to foster innovative and/or lower cost, services. There are a number of ways for RATEL to achieve these goals. To ensure phone access to the poor, such policies as universal service requirements/funds or special rate structures can be utilized. RATEL can support a competitive market for broadband by addressing such issues as local loop unbundling, cost-oriented and unbiased interconnection rates, licensing access to the international Internet, rules on numbering, and VOIP.

## 2.2 THE TELECOM INFRASTRUCTURE

### Overview

The nation's telecommunications infrastructure again displays deep-seated contradictions. Voice telephony is widely available, even in rural areas, at prices equal to or well below those of other countries in the region (even for international calls). Dial-up Internet access – slow and cumbersome as it is – is also relatively cheap and widely available. Mobile telephony, too, is strong, covering more than 90% of the country. Yet, until recently, Serbia has also suffered from one of the poorest telephony infrastructures in the region, smothering Internet adoption and innovative uses of ICT. Nor has wireless broadband filled the gap, as it has in other countries – primarily, it appears, due to Telekom Serbia's actions to control or repress development of wide area wireless networks.

Yet major change is at hand. Telekom Serbia has made enormous investments to upgrade the backbone infrastructure and make it broadband-ready. Soon, ADSL broadband will be widely available across Serbia at extremely competitive prices. Access to the Internet could take off if RATEL seizes the opportunity to open competition – by ensuring fair access to

Telekom Serbia's modernized network, enabling independent access to the international Internet, and legalizing voice-over-Internet-protocols (VOIP).

Despite the constraints they face, Serbia's ISPs have created the epitome of vibrant competition. More than 50 ISPs vie for customers, and several ISPs are ready and willing to compete vigorously with Telekom Serbia. Two have already taken steps to develop infrastructure linking to the international Internet independent of Telekom Serbia. Although most of the ISPs are in Belgrade, many also serve other, even more rural, areas. Meanwhile, mobile companies may join

Telecom Infrastructure	
<b>Strengths</b> <ul style="list-style-type: none"> <li>• Good phone access</li> <li>• New broadband access</li> <li>• Good mobile phone networks</li> </ul>	<b>Weaknesses</b> <ul style="list-style-type: none"> <li>• Poor broadband access</li> <li>• Limited wireless broadband</li> </ul>
<b>Opportunities</b> <ul style="list-style-type: none"> <li>• Good phone access</li> <li>• New broadband access</li> <li>• Good mobile phone networks</li> <li>• Competitive mobile industry</li> <li>• Competitive ISP industry</li> </ul>	<b>Threats</b> <ul style="list-style-type: none"> <li>• Poor broadband access</li> <li>• Limited wireless broadband</li> </ul>

<sup>22</sup> Tariff restructuring is at the top of the priority list for TDA training of RATEL.

the fray, offering mobile broadband services. Cable companies and mobile phone operators are also positioning to go up against Telekom Serbia in the broadband market. Hence, with the right regulatory environment, along with these recent infrastructure advances, demand for the Internet and ICT could skyrocket in Serbia.

The following sub-sections provide the SWOT analysis of the telecom infrastructure in detail.

### 2.2.1 Infrastructure Strengths

**Good phone access.** Serbia has relatively good voice telephony access, with a penetration rate of about 36%, higher than the SEE average.<sup>23</sup> Costs of basic telephony are also lower than in other SEE countries, as are costs for slow-speed dial-up Internet access (see Section III.B.2 ICT Sector Weaknesses for details). Serbian consumers and businesses that want only very basic services enjoy low cost telephony for domestic calls throughout the country.<sup>24</sup> Even prices for international calls to countries in the SEE region are about average for the region, and to “distant” European countries (e.g., UK) are slightly lower than the SEE country average – although still significantly above the EU average. Similarly, Serbian businesses pay very low prices for telephony.

**New broadband access.** A significant improvement in broadband access is about to take place. Telekom Serbia has made major investments over the past few years to improve its infrastructure and prepare to expand broadband (ADSL) services. The new infrastructure completely changes the face of Internet access. The changes have both positive (see Section III.A.3) and negative (see Section III.A.4) implications. It is worth noting that the IT companies interviewed that provide software development services internationally reported no difficulty obtaining the broadband Internet links they need to match their international customers’ expectations. In all cases, they relied on TS’s services, leased line arrangements or ADSL. Of course, these particular companies are willing and able to pay well for such services, given the requirements of their lucrative international business.

**Good mobile phone networks.** Mobile phone networks are also strong, covering 90% of the country geographically. There are two active providers – Telekom Serbia’s MTS (49% owned by government) and Telenor (owned by Norway’s telecommunications group) – plus a new entry, Mobilkom, the Austrian mobile operator. Reflecting this competitive situation, all of the providers are planning further infrastructure investments that will enable broadband services.

### 2.2.2 Infrastructure Weaknesses

**Poor broadband access.** Thus far, broadband expansion has been extremely limited, and most Internet users have only dial-up connections, which are slow and cumbersome enough to deter most Internet uses. ADSL adoption has been meager (approximately 1% of users), and cable companies serve a very small proportion (4.7%) of Internet users.<sup>25</sup> In addition, the country –

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23 Report 2- Country Comparative Report. Cullen. Assuming that the average family size is three, and that most fixed line users are households and businesses rather than individuals, this rate implies that almost all households have a fixed line phone. Note that the CIA factbook differs, reporting that: “teledensity remains below the average for neighboring states.”

24 The price of domestic calls is actually lower than cost, according to the Cullen Report. Serbia has extremely low prices for both businesses (4%-5% of the EU average) and households.

25 Report 2- Country Comparative Report. Cullen. Cullen report notes that cable companies are operating without a licenses and accurate data on Internet subscriptions is not available; they estimate a couple of thousand. However, a representative of Telekom Serbia set the estimate much higher: about 50,000. 4, 7 % of the urban internet users, use

particularly Belgrade – has a very high proportion of party lines that severely hamper Internet access.<sup>26</sup> Not surprisingly, the problems in infrastructure quality and access are even more evident in rural than urban areas. Broadband has been available primarily in larger cities, at prices out of reach for most households and small and medium businesses.<sup>27</sup>

In part, the problem has been related to infrastructure. Digitalization of the fixed line network was sorely needed in order to provide broadband, new value-added offerings and high quality service. Serbia lagged behind most SEE countries in modernizing its telecommunications network, which reportedly was only about 65%-75% digitalized as of a report in May 2006.<sup>28</sup> The entire situation related to broadband is about to change, however, according to a representative of Telekom Serbia. TS is poised to make ADSL available throughout the country. (See Section III.A.3 Infrastructure Opportunities.)

**Limited wireless broadband.** Surprisingly, wireless broadband has not filled the gap as it has in many other countries. One estimate is that only 7% of Internet subscribers use wireless, mostly businesses in urban areas. Thus, wireless technology that has made it possible to expand access and drive down prices in other countries has not been widely utilized in Serbia. There are a number of contributing factors. Telekom Serbia appears to be positioned to control the licensed spectrum used for WiMAX (wide area wireless networks).<sup>29</sup> In addition, ISPs in Serbia are quite sophisticated, and competition among ISPs is intense. They recognize that wireless networks (WiMAX/WiFi) cannot compete with ADSL in quality, speed, and reliability. Furthermore, given the installed base of fiber landlines throughout much of Serbia, it is more expensive to create a new wireless network than to provide ADSL-based broadband in most areas – an expense not warranted on a business basis unless VOIP is legalized.<sup>30</sup> Finally, almost all ISPs rely in one way or another on the TS link to the international Internet and to landline telephones. Nonetheless, a few of Serbia's ISP's are providing wireless networks for businesses between branch locations and in a few, small geographic areas where this makes good business sense. These ISP's are capable of using wireless approaches when they are permitted to do so and would likely expand their usage considerably if they were permitted to offer numerated VOIP services with fairly priced interconnectivity to voice networks.

### 2.2.3 Infrastructure Opportunities

**Major broadband expansion.** A representative of Telekom Serbia reported that, due to major investments during the past few years, the company's backbone is now 90% digitized, and that some cities, e.g., Novi Sad, are 100% digitized, while Belgrade remains only 70-75% digitized. According to TS, the result will be widespread access to broadband, via ADSL, by the end of

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cable internet service. Cable TV is available on more than 90 percent of the territory of Belgrade and in parts of Pozarevac, Sabac, Valjevo, Novi Sad, Sombor, Kikinda, Kragujevac, Kraljevo, Cacak, Nis and Leskovac. However, the cable networks would have to be upgraded to offer Internet.

26 According to Report 2- Country Comparative Report, Cullen Report, Serbia has about 480,000 party lines (about 4% of total lines and 15% of analog lines), more than any other SEE country except Bulgaria. Most of the party lines are in the larger cities.

27 National Case Report: Serbia. Vladimir Radunovic

28 According to Report 2- Country Comparative Report, Cullen Report, only Bulgaria and Kosovo have a lower rate of digitization. Modernization was further hampered by war damage.

29 Telekom Serbia also appears positioned to control the 3.5GHz spectrum band used for WiMAX. TS currently controls half the 3.5GHz spectrum, and the rest is to be tendered. However, TS can also compete in the tender, and is likely going to "win" the other half.

30 Note that ISPs appear hopeful that VOIP will be legalized next year.

2007: 80-90% of subscribers – and 100% in Belgrade – will have access to ADSL. According to a TS representative, the company will introduce 100,000 new ADSL connections by March 2007, and another 200,000 by the end of 2007. Although most will be in Belgrade, Novi Sad and Nis, ADSL will be offered in 30 cities. If prices are competitive – the TS representative expected ADSL broadband prices to begin at 15 euros/month (which appears to be a very competitive price) – widespread adoption of broadband may follow as existing users switch from dial-up connections and new users are attracted to Internet services.

**Willing and able competitors.** If the policy and regulatory issues are resolved (see Section II.C.), giving ISPs fair access to the digitized network and independent access to the international Internet, a number of Internet Service Providers are able and eager to respond. Even now, they are preparing to create their own links to the international Internet, once they are legally able to do so. This vibrant and determined segment of the private sector opens valuable opportunities to make the most of Serbia's infrastructure.

Eventually, the strongest competitors to ADSL are likely to be cable operators. However, today the cable industry is in disarray. Well-managed licensing arrangements and considerable investment will be needed for cable to become a viable competitor to TS's ADSL network.

**Broadband via mobile phones.** Another opportunity lies in mobile telephony. Mobile companies cover about 90% of the country geographically and mobile 3G services may spread quickly throughout Serbia if RATEL rules that ISPs can offer VOIP services and prices are attractive. Under such a scenario, demand for Internet may skyrocket as people use 3G to access the Internet and make good quality VOIP phone calls, as well as utilizing the other features of broadband access.

#### **2.2.4 Infrastructure Threats**

**Telekom Serbia becomes further entrenched.** There is a very real threat that TS will further tighten its grip on the market. Currently, only two providers in the country have independent links to the international Internet and a distribution backbone: Telekom Serbia and VeratNet. The latter has a wireless link with more limited capacity, and has been unable to get a license to upgrade or expand its wireless links to the international Internet. One additional ISP, YUBC, reported having a permit to cross the border with fiber – the only company with such a permit other than TS – and the company has signed a letter of intent to cooperate with telecom companies in Hungary and Croatia.

In effect, virtually all users, including ISPs offering cable and wireless access, must rely on the TS network to reach the international Internet, including the ISP that has a wireless link to the international Internet. Businesses that require reliable, high speed Internet access often utilize both providers, to gain the protection of redundancy.

Furthermore, TS is about to roll out ADSL services throughout the country, providing broadband at levels of service and with a pricing structure that will be difficult to beat. TS has also made a strategic decision to enter the retail side of Internet Service Provision. Previously, TS sold only wholesale services, offering leased lines to ISPs at a discount that enabled them to resell access to retail customers (including businesses and residences). If TS offers competitive retail prices to very large customers, it will eliminate other ISPs' opportunity to serve those lucrative market segments. Thus, by entering the retail market, TS threatens to eliminate most of the Internet service competition.

Thus, although competition in the mobile market will continue to be strong, and cable companies are likely to find ways to compete (although they, too, cited limitations set by TS), the Internet Service Providers (ISPs) may find themselves with very constricted opportunities as TS begins to offer retail Internet services. Thus, the currently thriving and competitive ISP industry might become highly consolidated. This threat is particularly disturbing because Telekom Serbia has wielded its power to ensure that no other provider could compete effectively with its monopoly position. Other firms report tactics such as cut lines, threats to cut advertising, service reduction, jamming devices on leased lines, etc., if competitors criticize or cross TS. As a result, none are willing to go up against TS.

## 2.3 ICT INDUSTRY

### Overview

Despite the constraints they face, Serbia’s ISPs demonstrate the epitome of vibrant competition. More than 50 ISPs vie for customers, and several ISPs are ready and willing to compete vigorously with Telekom Serbia. Two have already taken steps to develop infrastructure linking to the international Internet independent of Telekom Serbia. Although most of the ISPs are in Belgrade, many also serve other, even non-urban, areas. Meanwhile, mobile companies may join the fray, offering mobile broadband services. Cable companies and mobile phone operators are also positioning to go up against Telekom Serbia in the broadband market. Hence, with the right regulatory environment, along with these recent infrastructure advances, competition and customer demand for the Internet and other ICT services could skyrocket in Serbia.

Perhaps the most impressive news comes from Serbia’s software development industry. These small but thriving companies have taken advantage of their technical prowess, English language facility, and proximity to and common culture with the EU, to begin to carve out a high value-added niche in the European market. The presence of major international ICT corporations has helped, many engaged in partnering with local firms and thus providing them with experience and a growing market. The strong demand for e-government applications also helps drive the industry’s growth. With the right support, these local companies could develop ICT applications for non-ICT industries that will generate broad economic expansion and job growth.

Yet it is not appropriate to be too optimistic. These Serbian companies have marked needs. They must develop stronger management, sales and

ICT Industry	
<b>Strengths</b> <ul style="list-style-type: none"> <li>• Strong software development sector</li> <li>• International corporate presence</li> </ul>	<b>Weaknesses</b> <ul style="list-style-type: none"> <li>• Inadequate management skills</li> <li>• Small companies</li> <li>• Workforce limitations</li> <li>• The wrong branding</li> </ul>
<b>Opportunities</b> <ul style="list-style-type: none"> <li>• Increased competitiveness in European markets</li> <li>• International corporate presence</li> </ul>	<b>Threats</b> <ul style="list-style-type: none"> <li>• Brain drain</li> <li>• Poor business-education links and education inertia</li> </ul>

marketing skills. Educational institutions must link more closely with the private sector, in order to respond to workforce needs, e.g., provide students with more practical experience. They also need to incorporate ICT into non-technical fields. The problem bedeviling other developing markets – brain drain – is a serious threat to the industry’s future. Finally, the country needs

more “good press” to attract investment and counter internationally held stereotypes rooted in the Milosevic era.

The following sub-sections provide the SWOT analysis of the ICT industry in detail.

### 2.3.1 ICT Industry Strengths

Statistics on the number of ICT companies differ. As of 2004, there were 2,000 ICT companies in Serbia, of which 1,100 were involved in software development. The majority of these companies are in Belgrade, Nis and Vojvodina. With an annual growth rate of 18%, the estimated number of companies today is almost 2,800.<sup>31</sup>

**Competitive mobile industry.** The ICT industry segment that provides communications and Internet access has a number of strengths. The mobile phone market is far more competitive than fixed line telephony. The two current mobile competitors, MTS and Telenor, have achieved 73% penetration of the population between them. Reflecting this competitive situation, new services are expanding rapidly and mobile phone pricing structures are quite competitive.<sup>32</sup> At the end of 2005, Telenor had a 45% market share (about 2.5 million subscribers), while MTS held the balance, 65% of the market (approximately 3.8 million subscribers).<sup>33</sup> The mobile phone companies are moving to offer new services, such as 3G with broadband services (ability to surf the Web as well as receive email). MTS will be the first, with a pilot involving 100,000 subscribers (in Belgrade, Novi Sad and Nis), but will be followed quickly by the other providers.

**Competitive ISP sector.** Also in contrast to the telecommunications industry, Internet Service Providers (ISPs) operate in an active, open, competitive market. At last count, there were 53 ISPs serving the country, of which five are of very significant size. Most ISPs are small companies that resell access to the networks of larger ISPs. Two ISPs, VeratNet and YUBC, have been taking steps to develop infrastructure independent of Telekom Serbia. VeratNet is the only provider with an independent link to the international Internet. YUBC has a permit to lay its own fiber optic network across Serbia’s international borders. Such a backbone would be the first to compete with that of Telecom Serbia, without the limitations of wireless technology.

The cable industry offers another interesting alternative. There are multiple providers, with 29 TV cable operators, a number of which provide cable Internet access. The cable industry can provide strong, viable competition to ADSL if companies upgrade their systems and become better organized. SBB is the major cable company, and it has bought and upgraded smaller companies over the past few years.

**Industry example:** With 200 employees, Saga is the largest system integrator in Serbia, and third among ICT companies in revenue. The company focuses on 5 industries: telecom, financial institutions, large manufacturing, oil, and government. It partners with Serbia-based branches of international vendors to provide a wide range of services, including customer relationship management s/w, networking, software development, consulting, and customizing packages to the Serbian context.

31 ICT in Serbia, powerpoint presentation, Serbia Chamber of Commerce. [www.elitex.in/paper2005/radmila.ppt](http://www.elitex.in/paper2005/radmila.ppt). GTZ reports that there are 600 ICT companies, of which 300 are software developers; however they appear to be working with a selected group of the ICT software developer segment.

32 Costs of mobile to fixed termination are somewhat higher than other SEE countries, perhaps reflecting higher termination charges by Telekom Serbia.

33 Note that figures on market share were not consistent across reports. Some reported that

**Strong software development sector.** Serbia's software development sector demonstrates major strengths. First, IT companies offer skills and characteristics that provide them with a competitive advantage in the European market, e.g., pervasive English language skills and a culture that has much in common with companies in EU markets. Second, a number of local ICT companies offer very strong technical skills that have attracted partnerships with international firms and won them a place in relatively high value-added niches. Importantly, local companies are building a reputation in specific competencies, e.g., financial software. Most of these companies are concentrated in Belgrade and in the other major urban areas, Novi Sad and Nis.

**International corporate presence.** Another strength is the presence of leading international ICT companies, e.g., IBM, Microsoft, Oracle, etc. These firms have involved local companies in software development efforts that strengthen the local companies' capability, and these activities are beginning to brand Serbia as a valuable source of software development talent. Microsoft, for example, has located and is now expanding its development center in Serbia, reporting that the calibre of the software developers found in Serbia – selected in a rigorous and very competitive process – measures up to international standards. Microsoft has such development centers in only four locations outside of its headquarters in the US, so this is significant sign of the strength of Serbia's IT sector.

### 2.3.2 ICT Industry Weaknesses

**Inadequate management skills.** Although Serbia's applications development ICT segment has valuable strengths, there are critical weaknesses throughout the ICT industry, primarily in the areas of management, sales and marketing skills. These shortcomings hinder the companies' ability to grow and to compete in international markets. The companies themselves have recognized their limitations, and are eager for training in these areas to improve their capacity.<sup>34</sup>

**Small companies.** Many opportunities in the international market require a sizable workforce in order to deliver large, complex jobs. Although there are a number of extremely skilled Serbian IT companies, most are very small – under 25 staff – limiting their ability to attract international contracts. Although some are thriving in niche markets, prospects for the IT industry will be limited unless these companies can either grow considerably and quickly or collaborate in systematic, reliable ways to become a “virtual” firm when the demand warrants it, while operating as independent smaller firms when demand slows.<sup>35</sup>

The software development company, Arhel, provides a good example of a strong, but small, Serbian ICT firm. This eight-person firm has clients in Italy, the Netherlands, and elsewhere in the EU. They work on both open source and proprietary programs, including interactive websites, e-commerce solutions, and cutting edge interactive media applications. They also view Government of Serbia investments in e-government programs as an important opportunity. For them, a major challenge is pursuing opportunities in the larger international market, without contacts and sufficient staff for extensive marketing.

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<sup>34</sup> See IFC Report, Investing in Serbia's Internet and IT sector: Challenges and Opportunities, Public Report, 2004. They cite companies' strong interest in receiving training.

<sup>35</sup> The “Virtual Business Incubator” developed with USAID funding and cooperation with regional partners, [www.virtualmarketopener.com](http://www.virtualmarketopener.com), represents a potential means for Serbian IT companies and experts to gain entry to international markets.

**Workforce limitations.** IT industry growth is also constrained by the educational and workforce development systems. University technical education programs have some outstanding faculty and curricula that provide students with a strong foundation in the theoretical aspects of their technical fields. However, they generally do not provide the practical experience students need to be productive workers, especially in relatively demanding higher technology fields, or to offer the management skills that companies seek. Although the universities have some initiatives to link with the business sector, all the businesses with which the team met reported that stronger ties between universities and business were needed, and that graduates lacked skills required for them to be immediately productive. It was also striking that none of the companies interviewed were involved – or knew of other companies being involved – in any type of internship programs.

**The wrong branding.** A number of ICT companies identified problems with Serbia’s “branding” as major obstacles to competitiveness in world markets. Too often, they explained, potential customers’ knowledge of Serbia is limited to negative images stemming from the Milosevic era. The country has little visibility as an ICT development resource.

### 2.3.3 ICT Industry Opportunities

**Build on outstanding firms.** Serbia’s small core of highly skilled and experienced IT applications development companies can provide opportunities for growth, helping to brand Serbia as an attractive place for foreign investment, as well as providing models for other IT firms in the country. Most of these firms are working with proprietary software, often on customers’ platforms. Major areas of strength for Serbian companies are financial services applications and industrial applications/process control.<sup>36</sup> Serbia is beginning to develop positive branding in these areas.

**Pursue open-source software development.** The most fertile opportunities for growth of Serbian ICT companies may lie in areas that are not strong among competitors such as Indian firms. One such area is development of open source software.<sup>37</sup> Use of open source software appears to be steadily expanding among individuals and companies in Serbia, and growth is likely to continue as the government enforces laws on software piracy and copyrights. Although such crackdowns can be painful to those using pirated software, they can ultimately have a very positive impact, as local software companies gain confidence that their work will be protected, and as local demand for open source software grows, within and outside Serbia. The international market for skills in working with open source software is also growing. Another potential area is software to support supply chain management (proprietary or open source) and value-added services to customers. Again, demand is growing and typical competitors, such as Indian firms, are not very active in this niche.

**Take advantage of e-Government opportunities.** A third area of opportunity is development of e-government applications. The Government of Serbia is a large market, with the National Investment Plan earmarking over 40mm euros for e-government applications. Serbian companies

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<sup>36</sup> OECD Report “An Overview of the Information & Communications Technology Sector in Serbia” (2004)

<sup>37</sup> Although open source software is open to change by others, there are proven business models for IT firms to compete and grow even though the code developed is usable by others. For example, IBM has a large team in the US dedicated to testing changes to open source software used by clients to ensure it meets clients’ security requirements.

have developed innovative applications and can build branding in e-government capacity, especially as they gain experience through the activities developed under the NIP.

**Partner with international firms.** The international ICT companies that have already located in Serbia offer other important opportunities. They appear to be eager to partner with Serbian firms, finding Serbian software developers to be skilled and comparatively lower cost than those in other countries in the region. As mentioned above, Microsoft has established a major software development center in Serbia, one of five in the world. By providing a “domestic” demand for high quality, sophisticated technical skills, these international firms help to build local IT companies’ capacity and strengthen their ability to compete in international markets.

**Strengthen business-education links.** With the right support and willingness to innovate, the leading university technical programs also can contribute to strengthening the country’s ICT industry. Most important is strengthening the links to the business community. In addition, there are private universities, e.g., Singidunum University, that are positioning themselves to build a broader workforce of individuals able to use ICT effectively in non-ICT positions. International companies can be valuable partners in this effort. They have an incentive to support stronger technical education systems and build the capacity of local software development firms. By partnering with the international ICT companies, donors and public sector institutions can gain powerful resources, including business network links with the international market and options for providing ICT companies and university students with sophisticated hands-on experience. For example, the University of Belgrade’s Mihajlo Pupin Institute offers an opportunity to attract major ICT companies as partners in innovative technology development that provides students with hands-on experience.

#### 2.3.4 ICT Industry Threats

**Brain drain.** The ICT industry faces some serious threats. Perhaps the most immediate and dangerous are those related to workforce development. One is “brain drain,” loss of talented technology professionals who can make significantly higher incomes in Europe or the US. Up to 80% of those with strong software skills have left the country during the past decade, going mainly to USA, Canada and Australia. The current “pull” from higher wages may prove even more devastating to the development of the ICT industry than was the previous “push” from the war.

**Education inertia.** Another workforce-related threat involves university and secondary education that fails to provide students with strong skills. Although the top technical university programs endeavor to keep their technical courses current, not all universities are able to do so. An even broader threat comes from the fact the other university faculties appear to resist integrating ICT into their programs. As a result, graduates of non-ICT programs lack skills, experience, and confidence in using ICT effectively at work. The situation for secondary schools is worse. All too often these schools resist changes in curricula that would make education more responsive to business needs. Even programs that aim to teach skills on modern equipment often lack sufficient expertise among faculty. Some private university programs are endeavoring to build ICT skills among students in non-technical programs. However, they also have limited resources. Internships for either university or secondary school students appear to be extremely rare.

## 2.4 THE COMMERCIAL, GOVERNMENT AND CIVIL SOCIETY MARKET FOR ICT

### Overview

Serbia's market for ICT is at a crossroads. The track record is, by and large, disquieting. A weak infrastructure has smothered overall demand for the Internet. A mere quarter of the population uses the Internet in any way. The percentages are even worse among the traditionally underserved, e.g., rural areas, women, the poor. Serbian businesses, struggling to survive, lack the financial wherewithal, knowledge and skill to adopt the ICTs they need to compete in higher value-added sectors. Most NGOs have computers but not the ability to use them strategically to support their goals. ICT companies confront the challenge of being late-comers to the international market.

The situation would be bleak were it not for some key shifts and an underlying market strength thus far latent rather than realized. First, overall public demand for the Internet is rather impressive, given the constraints users face: slow connections, low income levels, high unemployment, not to mention residual effects of war devastation. The 24% Internet penetration among the populace, 41% among households, matches some countries where access has been far easier and more actively promoted. Although one survey of future Internet adoption delivered disturbing results, another offers a quite optimistic forecast.

For Serbia's software development industry, the future is promising. The EU offers a growing and nearby market. Government ICT adoption is on the rise. NGOs are eager adopters, primarily needing guidance in strategic applications. Better access to ICTs that improve competitiveness, combined with a demonstration effect from a few early adopters, could drastically boost SMEs' ICT adoption rates, fueling economic growth in a "virtuous cycle." The prospects are particularly favorable for certain major industries such as agriculture.

Thus, Serbia's market for ICT appears to be at a brink...of either rapid ICT adoption and innovative use or else stagnation, deeper digital divide, and a continuous game of "catch up." The direction taken will be heavily influenced by whether and when some key actions are taken: opening up a more competitive telecom market; providing strategic assistance to give SMEs affordable access to ICTs with demonstrable bottom-line results; strengthening key workforce skills for both ICT and non-ICT companies, with better linkage of the business needs and educational curricula; expanding NGOs' knowledge of innovative ICT practices worldwide.

Market for ICT	
<b>Strengths</b> <ul style="list-style-type: none"> <li>• EU market potential</li> <li>• Large e-government market</li> <li>• Relatively strong NGO demand</li> </ul>	<b>Weaknesses</b> <ul style="list-style-type: none"> <li>• Slow connections</li> <li>• Low public demand</li> <li>• Limited SME financial resources</li> <li>• Lack of awareness of ICT strategic benefits</li> <li>• Late-comer status in the international market</li> </ul>
<b>Opportunities</b> <ul style="list-style-type: none"> <li>• Strategic ICT use among SMEs and NGOs</li> <li>• Market for e-government</li> <li>• Public responsiveness</li> <li>• National Investment Plan</li> <li>• FDI promotional activities</li> <li>• ICT contributions across development activities</li> </ul>	<b>Threats</b> <ul style="list-style-type: none"> <li>• Monopoly entrenchment reduces responsiveness to market</li> <li>• Stagnating market could discourage ICT investment</li> <li>• Digital divide could grow</li> </ul>

The following sub-sections provide the SWOT analysis of the ICT market in detail.

### 2.4.1 The Market for ICT – Strengths

**EU market potential.** A major strength enjoyed by the Serbian ICT software development segment is close proximity to the EU’s large market. Indeed, “near-sourcing” – obtaining contracts that depend on geographical proximity, in Serbia’s case the EU – is already growing. This phenomenon has two major benefits. First, of course, it helps generate growth in the ICT industry, providing a lucrative and expanding market for ICT products and services. Secondly, it provides Serbian ICT companies with the experience of working in a demanding and sophisticated environment, which strengthens their skills, not only in technical areas but also in management, sales and marketing. These young companies get the opportunity both to learn how to respond to a demanding customer and to observe skilled project management, marketing and sales operations. They can apply these experiences to other forays into the international market, as well as to introducing and delivering ICT services to Serbian businesses.

**Large e-government market.** As in many developing or emerging market countries, the Serbian government is a major customer for ICT products and services and a driver of growth in the ICT market. The GOS is clearly interested in adopting ICT solutions, and the National Investment Plan identifies a number of e-government applications that the GOS intends to adopt, including linkages to local-level institutions. With an NIP budget of over 50mm euros for ICT-related activities, the GOS demand for e-government applications is a major strength.

The municipality of Indjija <[www.indjija.net](http://www.indjija.net)>, led by an innovative mayor, has made impressive progress toward its goals of providing valuable e-government services, attracting business investment, closing the local digital divide and increasing e-literacy. ICT staff have networked all town institutions, including schools, and ultimately plan to provide wireless Internet access throughout Indjija. Their online service provides citizens with access to personal documents, licenses, and other information. Most of the expenses were covered by municipal government funds, with 1% of tax collections dedicated to the initiative.

Indjija's government has also adopted a system developed in Belgrade that allows payment for parking by mobile phone. Results: costs cut by 15%; parking revenues increased by a factor of 10.

At the local level, there appears to be growing interest among municipalities in adopting e-government applications that can improve services to citizens. The municipality of Indjija is a highly publicized example. It has created a one-stop-shop service center that citizens can call, email or visit to request information on virtually any aspect of the local government and be served by staff using computers to obtain information and respond to these requests. Associated with the one-stop-shop is a website which provides information and a means for submitting requests for information or help. More than 50 other municipalities have adopted one or more components of the e-government application, which was developed by a local software company in collaboration with Indjija officials.

**Relatively strong NGO demand.** Serbia appears to enjoy relatively high Internet penetration among NGOs: in 2001, 60% of NGOs had email and 14% had websites, a higher percentage than most other countries in the region.<sup>38</sup> Most NGOs use computers, and email appears to be

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38 The Use of Information and Communication Technologies by Non-Governmental Organizations in Southeast Europe: A Joint Study by the Southeast Europe Initiative of OneWorld International and the Information Program of the Open Society Institute, 2001

widespread.<sup>39</sup> However, the use of websites (often motivated by the desire to attract international donor attention), appears to be rather limited, designed primarily to provide information on the NGO's activities. Although the NGO market for ICT is small relative to commercial demand, it is important both to integrating ICT use in civil society and to helping expand the public's awareness of the value of ICT.

Some NGOs, however, go beyond routine uses of ICT, using more advanced tools, e.g., Web fora, chat rooms, participants' blogs, instant messaging, voice over IP services, etc. In these cases, ICT serves a very specific target group, persons involved in the NGO's activities. Thus, although these applications help the NGO to conduct its activities and to engage its target group of involved individuals, they are generally not used to reach out to the broader public.

In addition, there are some quite sophisticated uses of the Internet. For example, the Center for Research of Information Technologies, Belgrade Open School (CePIT)<sup>40</sup> has conducted more than 15 e-learning courses on various topics (e.g., democracy, peace, reconciliation, gender, etc.) over the past few years. It also provides training to other NGOs interested in conducting e-learning programs, thereby expanding capability and impact of the NGO community.

The Center for Free Election and Democracy (CESID) <<http://www.cesid.org/eng/index.jsp>> makes innovative use of a widespread and relatively simple technology: text messaging. Using SMS, CESID helps thwart election fraud by reporting local election results immediately after votes are counted. The staff also use the Web to conduct surveys on public policy issues and distribute results. Their use of ICT threatens certain powerful interests. For example, they have endeavored to develop a single voter database, and were promised funding for this from a donor – but were unable to obtain government approval to implement it.

This NGO has also been innovative in offering commercial services, e.g., surveys, via a for-profit arm.

The NGO Jednake Mogućnosti (Equal Opportunities)<sup>41</sup> is establishing a digital “Gender library” containing publications related to gender issues, NGOs active in the area, experts, relevant legislation. Creating such a library that is user-friendly is a challenging task. If well designed, it can make an important contribution to the field, and particularly those working on gender rights in Serbia.

Women at Work seeks to improve women's access to jobs, especially those traditionally dominated by men. For them, ICT is crucial and they work actively to expand ICT capability among women's organizations in Serbia. Activities have included free software and training for women's NGOs, e.g., in web development, content management and audio-for-Web. They also use open source (OS) applications, receiving support from OS experts who volunteer.

Yet another example is the NGO SEEcult, which is creating a regional information network and online database in the field of culture and art in South East Europe, featuring a multimedia regional portal.<sup>42</sup> It provides photos, notifications of cultural

events, and information on culture and art in Serbia. Not only is this a valuable use of the Web for dissemination of information that would be difficult to share otherwise, it provides a positive depiction of Serbia both within and outside the country.

39 The Use of Information and Communication Technologies by Non-Governmental Organizations in Southeast Europe.

40 <http://www.bos.org.yu/cepit/>

41 <http://www.e-jednakost.org.yu/eindex.html>

42 SEEcult.org

## 2.4.2 The Market for ICT – Weaknesses

**Obsolete technology.** ICT access in virtually all sectors has been limited by obsolete technology, e.g., dial-up Internet access. Clearly these infrastructure constraints are a major weakness. However, if they are reduced – through TS’s new ADSL network and/or RATEL’s opening of the market – other weaknesses will become even more salient.

**Low public demand.** Access to and demand for ICT is weak among the general populace. A major factor is income level. In a country where the average income is less than \$500/month, people find it difficult to buy computers and pay for Internet access beyond dial-up (which is only marginally more expensive than telephony alone).<sup>43</sup> The data are sobering. A recent survey revealed that only 41% of households have a computer<sup>44</sup> and approximately 24% of the population uses the Internet.<sup>45</sup> Per capita spending on IT is approximately \$43, lower than in Croatia (\$49) and far lower than Slovenia (\$292).<sup>46</sup> Computer equipment sales dropped 25% in 2005.<sup>47</sup> According to the Global Information Technology Report for 2005-2006, Serbia ranked 80th out of 115 countries in the “network readiness” index, which measures “the degree of preparation of a nation or community to participate in and benefit from ICT developments,” slightly *lower* than the previous year.<sup>48</sup>

Conditions are even worse for certain segments of the population – often those served by NGOs. Although target groups for NGO activities vary widely in their access to and use of ICT, and some are quite ICT savvy (see Section IV.A.), most of those served by NGOs have very limited access to and awareness of ICT benefits. This situation constrains NGOs’ ability to use the Internet to serve their target groups. For example, ICT access and use in rural areas is minimal (see Section IV.D. ICT Market – Threats). NGOs serving women report that there is a low level of ICT access and use among woman and girls.

**Limited SME financial resources.** SMEs are the engine for growth in most emerging market countries, including Serbia. Yet non-ICT companies in Serbia have very low rates of strategic ICT use. Although many small and medium companies own a computer, most lack the resources

ICT adoption has a significant positive impact on agricultural productivity and exports (Lio, *ICT and Agricultural Productivity*). Adoption of modern industrial inputs in agricultural production relies on a modern ICT infrastructure. Compliance with EU and US import regulations, e.g., EurepGAP, requires effective use of ICT. Yet a recent study found that the food processing industry in Serbia is largely uninformed about international practices, especially EU legislation (IFC, Six-Month Progress Report).

to adopt key ICT innovations that could enable them to become more competitive. The problem is particularly serious because many of the technologies that SMEs must adopt to be competitive in international markets are far more expensive than most individual SMEs can afford. If non-

43 TS estimates that people will allocate 5%-10% of their incomes to ALL telecommunications/ICT expenditures.

44 CePIT, Centre for Research of Information Technologies, Belgrade Open School, Internet penetration in Serbia 2006.

It can also help to put these data into context. Rates of adoption are higher in the region, as well as the lower-income EU countries. In Croatia, almost 56% of households have computer; 44 in Bulgaria, 40% of households with children have a computer<sup>44</sup> and 59% of students in 11th grade have PCs at home. In the EU, the lowest PC penetration rates are in Greece (33%) and Portugal (34%). [http://ec.europa.eu/public\\_opinion/archives/ebs/ebs\\_249\\_sum\\_en.pdf](http://ec.europa.eu/public_opinion/archives/ebs/ebs_249_sum_en.pdf)

45 The CePIT 2006 survey found that 24% of the population uses the Internet. A CESID study for the Telecom Serbia at the end of 2005 found that 13% of the population uses the Internet <http://www.elisa-project.net/statistics.php?language=en&country=Serbia>

46 Global Information Technology Report for 2005-2006

47 The decline has been attributed to the introduction of Value Added Tax on computers.

48 Global Information Technology Report <http://www.weforum.org/en/initiatives/gcp/Global%20Information%20Technology%20Report/index.htm>

ICT companies do not have a way to gain access to these strategic technologies, the impact will be a lower rate of economic growth.

**Lack of awareness of ICT strategic benefits.** Non-ICT SMEs lack not only the financial resources but also the knowledge they need to adopt ICT applications that will significantly improve their competitiveness. They use computers primarily as word processors or for financial administration. They have a dearth of information about requirements to compete in international markets that rely on ICT. They also have limited or no access to resources that could help them adopt and utilize strategic technologies. Consider the findings of a recent study: only 7% of Serbian firms were knowledgeable about international standards and technical regulations related to their industries, while 53% were partially informed and 30% completely uninformed.<sup>49</sup>

NGOs face similar difficulties. Although they often have a computer, most use ICT in relatively limited ways, e.g., for email and for websites providing information on the NGO. They lack access to information about strategic ways to use modern ICT to achieve their goals. Moreover, their target groups generally have limited ability to benefit from the ICT applications the NGOs do use.

Unfortunately, the media provided little support for raising public awareness of the benefits of ICT. According to a recent survey, almost 40% of the population has no intention of using the Internet in the future.<sup>50</sup> Furthermore, there is a lack of local content in Serbian. Although media such as B92<sup>51</sup> provide news, sports, and entertainment attractive to the local population, they primarily serve urban individuals in their 20's and 30's, in higher income brackets. They do not endeavor to popularize understanding among the broader population of the ways in which ICT can improve education, work, government and social services.

**Serbia is a latecomer to the international market.** Serbia's ICT industry faces a major challenge in being late to enter the international market as a recognized source of high end skills. Other countries in the region have already gained a reputation for ICT skills, and have taken the initiative to expand broadband access. As wages in Serbia are higher than in some competitor countries, e.g., Ukraine and India, it is particularly important for the international market to become familiar with the skills Serbia has to offer. Experience from other countries, such as India, demonstrate that it takes time for companies in developing countries to build a reputation among international firms, especially if they seek to compete on the basis of high value-added skills rather than cost. Serbia needs to move more quickly to establish those relationships. This is especially important for Serbia as potential international customers too often associate the country with war rather than with advanced ICT skills.

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49 Six-Month Progress Report: International Standards and Technical Regulations Projects; Reported to Royal Norwegian Ministry of Foreign Affairs. Private Enterprise Partnership Southeast Europe, International Finance Corporation, World Bank Group. June 30, 2006

50 Data from CePIT survey: they report that about 24% of the population uses the Internet, and over half of non-users do not intend to use the Internet in the future.

51 B92 is, in essence, and not-for-profit organization. Formally entitled B92 Trust, it is a limited liability managing company owned by executives, editors, and founders of the Company. Under the B92 Trust's statutory provisions, the owners of the B92 Trust are not permitted to sell or transfer their shares in the B92 Trust, nor to receive any profit or dividend from B92 on the basis of their equity in the B92 Trust. One additional owner is Share Fund, a state-owned financial agency that owns only 7 shares and exercises its voting rights just as the other shareholders.

### 2.4.3 The Market for ICT – Opportunities

**Strategic ICT use among SMEs.** For some non-ICT industries in Serbia, there are opportunities to reap huge benefits from strategic use of ICT. Agriculture is a good example. In order to export to the EU or US, certain types of ICT applications are increasingly essential for agricultural producers, while other applications can provide a competitive edge. For example, ICT-enabled logistics management systems may help Serbian firms compete better, especially given Serbia's location on major international land transport routes. Another example of an ICT-enabled application for Serbian agriculture SME's is one that meets the EU's food traceability requirements. This, in turn, would allow SME's to take full advantage of this substantial data-gathering task to improve their management in order to meet customer delivery and quality requirements. There is an enormous opportunity to increase Serbian SME competitiveness through improving companies' understanding of the advantages that strategic ICT applications can provide for compliance with international practice and EU and US legislation, and providing those companies with access to facilities that offer those "strategic applications" when they are too expensive for individual SMEs to acquire on their own.<sup>52</sup>

**Market for e-government.** The GOS's commitment to expand e-government activities at the national level provides major opportunities for the ICT industry. This level of demand can propel the industry forward, and can be even more powerful if it includes development of e-government applications that can be marketed in other countries. Some applications will provide other benefits to the economy at large. Take the proposed e-procurement application planned for development with GOS funding, in an effort to increase the efficiency and transparency of government procurement. This will be initiated through a tender, which may result in selection of a large international firm, or local experts, or some combination of the two. Either alternative has advantages: the former will engage local firms and experts who will gain valuable experience; the latter will provide local firms with a valuable track record (if implementation is successful).

Many municipal governments are also becoming prime customers for ICT solutions that help them improve services to citizens. Indjija's public administrators report that many municipal governments are adopting software similar to the application they are using. E-government adoption at the local level not only stimulates growth of local ICT companies but also provides citizens with exposure to using ICT, which can have multiplier effects. As citizens have a positive experience in using e-government applications, they may transfer that experience to using other types of ICT applications.

**Public responsiveness.** Although ICT use is weak (see Section IV.B), and the market for ICT could stagnate (see Section IV. D), there is considerable room for optimism. Given the constraints they face, Serbians' rate of Internet use (24%) and the 35% increase in Internet penetration in 2005, are encouraging.<sup>53</sup> Furthermore, according to one study, 68% of Internet non-users reported that they planned to use the Internet in the near future.<sup>54</sup> (Note, however, that

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52 Six-Month Progress Report: International Standards and Technical Regulations Projects; Reported to Royal Norwegian Ministry of Foreign Affairs. Private Enterprise Partnership Southeast Europe, International Finance Corporation, World Bank Group, June 30, 2006

53 Note that Macedonia, which has received strong support for the supply side of ICT, only has overall penetration rates (27%) slightly higher than Serbia (24%), where the market has been seriously constrained.

54 National Case Report: Serbia. Vladimir Radunovic.

this statistic contradicts one from the CePIT study, in which more than half of non-users claimed they did not plan to use the Internet in the future)<sup>55</sup>

These statistics suggest that the key opportunity for Serbia lies in demand side stimulus (in contrast to countries like Macedonia, which had supply-side constraints). Actions that stimulate ICT demand could create a “virtuous cycle” in which citizens increase their use of ICT, which generates further incentives for governments and businesses to adopt ICT applications, and thus for RATEL to improve the regulatory environment, which could then generate new FDI and export opportunities.

**National Investment Plan.** Although some of the initial ICT-related proposals submitted for National Investment Plan funding were not well conceived (e.g., planning to buy computers for schools without providing teachers with training in integrating ICT into teaching and learning), nonetheless, these major investments should provide key opportunities to increase the public’s recognition of the value of ICT and to stimulate ICT industry development. For example, plans to provide 30,000 computers to schools generated broad media attention (though the tender subsequently failed). Such publicity could be leveraged to raise public awareness of the value of ICT generally. It might also spur a variety of local public-private sector initiatives to help schools take better advantage of the computers. The NIP investments cover a wide range of areas and aim to improve conditions in all sectors. Like the e-government initiatives, the stimulus from the NIP will provide an engine for growth in the ICT industry.

**FDI promotional activities.** Efforts to promote foreign direct investment (FDI) also provide opportunities to improve the use of ICT among Serbia’s non-ICT companies, as well as to stimulate growth in the ICT industry. For example, the Serbian Foreign Investors Council<sup>56</sup> has identified improved ICT infrastructure as a key factor in attracting FDI. Pressures from business can help to convince the government that it is time to liberalize the telecommunications industry. A more competitive telecommunications environment could prove an asset that attracts international firms.

In addition, efforts to promote foreign investment can help raise the visibility of Serbia’s ICT industry, particularly in areas of special expertise, e.g., applications for financial institutions. Serbia’s ICT industry will get the most out of these opportunities by focusing on areas where there is less direct competition from lower-cost countries and where Serbia’s businesses and public are ready to adopt innovative applications, e.g., using mobile phones to pay for parking.

**NGO strategic ICT use.** As mentioned, NGOs often obtain computers and are fully aware that ICT is important and can provide value. What is missing for many NGOs is experience and knowledge regarding specific, relevant uses of ICT, and especially awareness of creative, effective applications being used elsewhere in the world. Today, NGOs in Serbia appear to employ four major types of strategies for using ICT:

- *Knowledge-sharing, awareness-raising:* Using ICT to disseminate data or information important to those working in the NGO’s area of concern, or to the public to promote a social goal.

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55 CePIT, Centre for Research of Information Technologies, Belgrade Open School, Internet penetration in Serbia 2006

56 <http://www.fic.org.yu/>

- *Action-research*: Using ICT to gather, process and analyze data, in order to promote a social goal and/or improve the effectiveness and efficiency of the NGO's and others' efforts to pursue that goal.
- *Mobilization, advocacy, and networking*: Using ICT to forge communications and coordination links among NGOs dedicated to similar goals.
- *Capacity-building, training, education*: Using ICT to develop skills and resources within other NGOs dedicated to similar goals.

Yet there are valuable opportunities to use ICT more innovatively. Examples include:

- *Involve Remote Areas as Active Partners*. Modern ICT can offer ground-breaking opportunities to engage local communities in NGO efforts. For example, a social action *cum* income-generation project could provide ICT to local women, in the form of electronic devices (e.g., mobile phones) that can be used to generate income.<sup>57</sup> As part of their responsibility in the project, the women could use ICT to gather and transmit data on a wide range of social action indicators. An adjunct to using ICT to involve remote areas is the use of ICT to *link* remote areas to each other to increase cultural understanding and help reduce seeds of conflict.
- *Global Alerts and Missing Persons*. A global "911" emergency number can give help to crime – including trafficking – victims, and to rescuers who identify or respond to them.
- *Expand and enhance training and capacity-building*. Training and capacity-building are needed for NGOs, health and social service agencies, and others dealing with social services. This is also essential to improve policy-makers' understanding of social issues and effective steps needed to address them. ICT can prove invaluable for meeting a good deal of these training needs. A range of technologies offers new opportunities to provide training even to isolated and rural areas.

The Government of Serbia has committed 3mm euros to establish a network of 16 business incubators across the country. They will partner with a range of donors, e.g., the Swiss, Austria, SIDA, Norway, each of which will support at particular incubator.

One donor sponsor of the incubator network is interested in working with USAID to create a service center that helps incubators use ICT strategically to strengthen and expand their impact.

**ICT contribution across development activities.** Although many donor activities aim to support economic growth, strengthen democracy, and improve governance, most do not incorporate strategic ICT-related efforts. There is an opportunity to improve the impact of donor activities through leadership in strategic uses of ICT. For example, the Government of Serbia will partner with several donors to establish a network of business incubators aimed at promoting SME development. The program will utilize the experience of a Norway-supported incubator in Nis, which provides space, production equipment, training and some financing to selected start-up companies. Although the incubators will provide certain ICT services, they would have far greater impact with strategic uses of ICT to achieve broad, significant improvements across industries.

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<sup>57</sup> For example, the firm Voxiva provides cell phones in rural areas of some developing countries, and trains local individuals to use telephone keypads to gather and input data for insurance agencies.

#### 2.4.4 The Market for ICT – Threats

**De facto monopoly could become further entrenched.** One looming threat for Serbia is that the changes discussed above – opening telecommunications industry competition, expanding broadband, increasing awareness of ICT benefits, strengthening ICT companies and linking educational and business sectors – will not be adopted in a timely manner and the country will fail to benefit from the innovative and market-responsive ICT use that flourishes in an open market.

**Stagnating market could discourage ICT investment.** Another major threat is that a stagnating market for ICT products and services will discourage international businesses from investing in Serbia. The data reveal the danger. Although overall spending on information technology increased by nearly 5%, all neighboring countries had considerably bigger increases in spending on IT, e.g., Bulgaria 15 %, Croatia 10% and Slovenia 12%. It is disturbing to find that only 13% of companies use the Internet as a source of information<sup>58</sup> and that only 25% of users use the Internet at work. Nor does it bode well that younger people, aged 15-19, have lower rates of Internet usage (26%) than do somewhat older individuals, aged 20-29 (with rates of 34%).<sup>59</sup> Worse yet, a mere 12% of Internet users access the Internet at school and only 19% of high school students report that they use the Internet at all.<sup>60</sup> Perhaps of greatest concern is that nearly half (47%) of Internet non-users reported that they have no need for the Internet<sup>61</sup> and more than half of non-users (52.1%) do not intend to use the Internet in the future.<sup>62</sup> (Note that the *National Case Report: Serbia* provides a more optimistic picture, with more than 60% of users reporting they plan to use the Internet in the near future.)

If these trends do not change significantly, Serbia will be trapped on the wrong side of the international digital divide, constraining all aspects of development: economic, educational, social progress. For example, although Serbia currently benefits from the presence of many international firms, that advantage could be lost if the local market for ICT services fails to develop, broadband access does not expand, and the portion of the workforce possessing modern technical skills continues to be limited.

All of these factors are closely interwoven. Strong demand for ICT, high quality local skills, and advanced infrastructure, all attract international investment, which further stimulates demand for and development of ICT services, a skilled workforce and technological advancement. Lack of these stimulants discourages investment, both foreign and domestic. Strong local ICT firms basically want to stay in Serbia,<sup>63</sup> but if the technology environment does not improve and domestic demand continues to be limited, these companies may decide to seek more advantageous circumstances. Once that type of outward movement begins, it is very difficult to reverse. Hence, if Serbia does not move quickly, other innovative SEE countries may leave

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58 Six-Month Progress Report: International Standards and Technical Regulations Projects; Reported to Royal Norwegian Ministry of Foreign Affairs. Private Enterprise Partnership Southeast Europe, International Finance Corporation, World Bank Group. June 30, 2006.

59 National Case Report: Serbia. Vladimir Radunovic, citing CePIT survey results

60 National Case Report: Serbia. Vladimir Radunovic, citing CePIT survey results

61 CePIT, Centre for Research of Information Technologies, Belgrade Open School, Internet penetration in Serbia 2006. Oddly, National Case Report: Serbia cites different results from the CePIT study: 33% of nonusers explain they would use it if they had the computer, while another 20% say they do not know how to use it. About 18% state they are not interested in Internet, 21% that they lack the time, while 20% state they can not afford it, and 7.23% of nonusers cite the inability to speak foreign language.

62 Data from CePIT survey.

63 All of the ICT firms with which the team met emphasized their interest in remaining in Serbia rather than moving to countries with higher pay rates.

Serbia so far behind that it will be extremely difficult to catch up, especially in market segments that are more value-added than body-shopping.

**Digital divide could grow.** Yet another threat is a growing digital divide within Serbia.<sup>64</sup> The average rate of computer penetration is far higher in urban (51%) than in rural (28%) areas, and higher in Belgrade (55%) than in Central Serbia (38%) and Vojvodina (36%). Low income households fare worst: those with the average monthly income of 50 euros per member rarely own a computer.<sup>65</sup> Similar disparities are evident in Internet use. Whereas 33% of individuals in urban areas use the Internet, only 12% of those in rural areas do so.<sup>66</sup> The lowest rate of Internet use (16%) is among households with monthly incomes of less than 50 euros per member.<sup>67</sup> Most (63%) ISPs operate in Belgrade, while the remaining 37% serve other parts of the country.

There are gender disparities as well. Men access the Internet at considerably higher rates than do women<sup>68</sup>: 31% and 17% respectively. A major obstacle for women is fear of using computers and other modern ICTs. Without targeted efforts, women are likely to fall further behind, especially those in rural areas.

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<sup>64</sup> Data drawn from a survey by the Centre for IT Research (CePIT) of Belgrade Open School, 2006

<sup>65</sup> CePIT

<sup>66</sup> Similarly, 43% of households in urban areas use the Internet, whereas only 19% of those in rural areas do so.

<sup>67</sup> Internet Penetration in Serbia 2006. Press Material. CePIT of the Belgrade Open School, Masarikova. 2006.

<sup>68</sup> These data come from the CePIT News release of survey results. Oddly, the National Case Report: Serbia by Vladimir Radunovic cites the CePIT survey results, but provides different data: 55% men and 45% women use the Internet

## 3.0 Recommendations

In the course of conducting the assessment, the team found a large number of areas in which Serbia could benefit from greater use of ICT. Moreover, the team concluded that this is a critical moment when Serbia is finally poised to “take off” in the ICT area, and strategic interventions could spell the difference between success or stagnation. These recommendations focus on just a few key ICT-related activities that USAID/Serbia could undertake to leverage its own and other development programs in order to have a significant, measurable impact across all of the Mission’s Strategic Objectives.<sup>69</sup> The recommended activities have synergies with each other, so would be most powerful if conducted as integral components of one overall program. However, each of the activities described below – or any element of an activity -- could also have a major impact as a component of a larger program that is already underway or in planning.

The team recommends the following four overarching components for Mission consideration:

- A. Leverage planned government investments and donor assistance for ICT.
- B. Support local efforts to improve the market environment for ICT development.
- C. Support access to sector-specific high impact ICT applications that significantly improve the competitiveness in an industry sector or the capacity of target NGOs.
- D. Support access to high impact ICT applications that improve competitiveness across sectors and across USAID Strategic Objectives.

### 3.1 LEVERAGE PLANNED GOVERNMENT INVESTMENTS

Leveraging other development efforts gives USAID an important and often cost-effective way to make a significant contribution. The Government of Serbia’s National Investment Plan (NIP) is a prime candidate, since it includes substantial ICT-related investments. There is an opportunity to add value and contribute to the success of these initiatives by providing high-level technical assistance during the substantive design, planning and implementation phases.<sup>70</sup> For example:

*Network linking all government agencies* – The GOS plans to invest €20mm to create a broadband Government Network that will link all public agencies throughout the country, starting with GOS ministries and subsequently encompassing local governments and local institutions, including schools and health care facilities. As with other parts of the NIP, this project will be initiated through a public tender, but it is generally expected that Telekom Serbia will get the nod, by offering use of its monopoly of the backbone for phone and Internet traffic and pledging additional investments on its own part. USAID, through its Serbia Economic Growth Activity (SEGA) is already providing support to the Ministry of Finance, the NBS and other public agencies on a number of IT projects. A major focus is on implementing systems for program budgeting and treasury management, with procedures that will apply to planning, budgeting and monitoring National Investment Plan projects. With some additional resources, that assistance could be expanded to advise on ways of using the planned investment in the government network to introduce greater competition in the telecom market, e.g.:

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<sup>69</sup> Appendix B shows USAID/Serbia’s Strategic Framework

<sup>70</sup> USAID is already engaged in such assistance under its Serbia Economic Growth Activity (SEGA).

- Detailing alternative approaches, such as utilizing the Electric Company network as the backbone rather than TS; tendering on a regional rather than a national basis, etc.
- Outlining the advantages and disadvantages of the various options, and analyzing their medium- and long-term implications
- Advising on tendering options and processes, and “lessons learned” from using the various options
- Encouraging both international and local operators to bid and to form consortia for improving their competitive position
- Explaining ways in which sub-national regional bidding could build local capacity and development
- Describing incentives that can be used to extend broadband access to local communities

*e-Procurement application* – As previously noted, the Ministry of Science and Ecology is planning a tender for an e-procurement system that will be aimed at improving transparency and efficiency in the procurement process. Funding is already provided for this project, which includes the following types of assistance:

- Technical assistance from experts with experience in designing and implementing e-procurement systems, using on-the-ground and distance TA
- Support for using the system to improve transparency, e.g., by spearheading a cross-donor initiative that helps ensure that the system is used to reduce corruption
- Targeted training on specific key aspects or components of the system

*Education and workforce development.* A plan to introduce 30,000 computers in schools with local area networks throughout the country gained much media attention and is potentially a worthwhile effort to provide valuable skills to upgrade the future workforce.<sup>71</sup> Yet there were important gaps in the design that could significantly reduce the positive impacts of this initiative. Chief among these were the lack of plans to train teachers and revise the curriculum to incorporate this technology. USAID could provide support to help increase the likelihood of a positive and valuable outcome by:

- Providing TA from experts with successful experience introducing ICT into schools and gaining performance improvements, in cooperation with other donors active in this area, such as EAR’s Vocational Education and Training (VET) program.
- Providing information on “success factors” and lessons learned about key areas that need attention and action when introducing computers in schools
- Facilitating public-private partnerships between the GOS and private sector companies interested in helping to bridge some of the gaps in the current plan

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<sup>71</sup> A tender issued for the computers did not result in selection of a vendor, so there is an opportunity to improve the project proposal before another tender is attempted.

### **3.2 SUPPORT LOCAL EFFORTS TO IMPROVE THE MARKET ENVIRONMENT AND INCREASE DEMAND FOR ICT DEVELOPMENT**

The importance of ICT development in Serbia, and the benefits to be gained, have not gone unrecognized in the local community; however, much more needs to be done to realize ICT's full potential. USAID could lend significant support to efforts to open the telecommunications/Internet market to full competition in a number of ways, such as:

**Strengthen key activist groups.** There are dedicated groups pressing actively to open competitiveness in the telecom environment. Their efforts focus on communicating the importance of change to RATEL and other government officials. One such group is led by a well-respected ICT business with significant experience in telecom networks. It aims to work through the American Chamber of Commerce, to organize and galvanize other companies that are concerned about the de facto monopoly situation but have not heretofore coalesced as a group. Another key player is the Center for Internet Development, the leading Serbian NGO active in information society policy.

These organizations are willing to take the lead and press hard for a more open, competitive environment. Their efforts could be greatly strengthened by support from USAID. Such support could include:

- Statements of recognition and support
- Sponsorship of activities promoting an open telecom market
- Financial support for actions related to opening the competitive environment, e.g., training businesses and government in the importance of an open environment, participation in relevant international events, and development of online facilities such as distance learning.
- Training and networking with other organizations involved in improving telecom regulatory environment

**Expand awareness of ICT benefits.** Awareness of the benefits ICT can deliver – especially in a competitive market – is low among SMEs, NGOs and individuals in Serbia. There is little media coverage of ICT advances and the benefits involved, and few sources of information, other than fee-based consultants or a small number of NGOs. In order to gain public support for a more open telecom environment, people must gain a better understanding of the stakes. USAID can help increase that understanding by:

- Supporting awareness campaigns and events on national and local levels, spearheaded by local organizations, educational institutions, NGOs, and business associations
- Providing access to international expertise experienced in building public support.
- Engaging students in the campaign. Perhaps use a model that has been successful on other issues, e.g., involving students in advocacy on environmental protection

**Build support among non-ICT companies.** Non-ICT industries have a tremendous amount to gain from an open, competitive telecom environment. Today, however, those companies are rarely, if ever, engaged in the issue. Involving these companies would add an important voice

that can speak for a wide swath of the Serbian economy while offering a more “impartial” viewpoint than that of the ISPs and other companies in the ICT sector. Activities could include:

- Incorporating elements of awareness-building about the issue into other economic growth activities
- Bringing ISPs and non-ICT companies together to discuss the implications of a competitive environment
- Sponsoring expert presentations at non-ICT business events and association meetings
- Inviting non-ICT companies from other countries in the region that have more competitive environments to speak about their experiences in using ICT

**Link with public diplomacy activities.** Many public diplomacy efforts endeavor to expand awareness of US values and the commitment of the American people to support economic growth and democracy in Serbia. USAID can work with the Embassy’s Public Affairs Office to extend these efforts into the ICT area by:

- Providing an element that raises awareness of the important role a competitive telecom environment has played in fostering innovation among US business and civil society organizations
- Developing and disseminating “success stories” of ways USAID support has fostered innovative uses of ICT and a competitive environment in other contexts

### **3.3 SUPPORT ACCESS TO AND USE OF SECTOR-SPECIFIC HIGH IMPACT ICT APPLICATIONS**

This activity uses high impact ICT applications to improve the competitiveness of an industry. Most importantly, it promotes the development of ICT-enabled entities that can serve all SMEs in an industry with affordable access to those ICT applications on a sustainable basis.

The hallmarks of this activity are:

- It *quickly* and *significantly* improves the competitiveness of an industry through the use of high impact ICT applications. These applications differ from those that provide value but do not enable major shifts in competitiveness of SMEs across an industry.
- It provides *all* SMEs in that industry with affordable access to the selected applications. Given the small size and limited resources of most Serbian SMEs, this element is crucial to achieving widespread improvements.
- It is *sustainable*. A strong business plan is required, along with a viable revenue model and local co-investment to assume a large portion of the financial risk, all of which help to ensure long-term sustainability.

<p><b>Opportunity:</b> Computer-aided design and computer-aided manufacturing (CAD/CAM) systems can help Serbian apparel companies enter higher value-added international market niches.</p> <p><b>Problem:</b> Most firms are too small to buy their own CAD/CAM.</p> <p><b>ICT-Enabled Service Enterprise:</b> Gives <i>all</i> apparel SMEs access to cutting edge CAD/CAM at an affordable price, along with market support, through a sustainable service center.</p>
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The major, industry-wide competitive advances that high impact ICT applications make possible have been demonstrated in the e-BIZ project in Macedonia.<sup>72</sup> Drawing from the “success factors” and lessons of that project, a similar activity could be launched in Serbia using ICT to improve SME competitiveness, probably as an option within a broader project. The major elements of such an activity include:

1. *Start with demand.* The first step is to identify high impact applications that can quickly and significantly boost the competitiveness of an entire industry, based on a market analysis of the industry. The focus can be on industries supported by USAID projects or other industries that could gain major growth via high impact ICT applications.
2. *Facilitate the development of sustainable, for-profit or non-profit entities that offer high impact applications at affordable prices to **all** SMEs in an industry.*
  - a. **Co-invest with selected partners in a competed and transparent “GDA”<sup>73</sup> approach.** Through an open tender, the activity selects local entrepreneurs as partners. The local partners make a substantial investment toward developing the ICT-enabled enterprise, which creates a strong incentive for them to support building the enterprise’s long-term sustainability. International companies may also make contributions. Local partners can be companies, individuals, or universities.
  - b. **Help develop solid business plans that support sustainability.** The activity ensures that the business plan provides a solid revenue model for the undertaking, thus helping to ensure profitability (or, if an NGO, a reasonable revenue stream) and sustainability of the ICT-enabled enterprise. At the same time, it is expected that the plan will ensure that the enterprise will offers the ICT applications at affordable prices to the SMEs in the industry it serves.
  - c. **Provide hands-on, cutting-edge technology and market expertise.** Serbian entrepreneurs/SMEs need capacity-building in management, marketing and sales skills. The activity provides this type of TA in a very close, hands-on manner through deep understanding of the business.

The Results: Sustainable enterprises that support major, quantifiable, industry-wide advancements in competitiveness:

- Offer fee-based high impact ICT services to companies throughout the target sector
- Are flexible and market-driven, delivering concrete impact on SMEs’ bottom line
- Have long-term owner commitment

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<sup>72</sup> In Macedonia, the e-Biz Centers are established through co-funding between USAID and local partners, e.g., entrepreneurs, SME consortia, universities or other organizations. The cost of an e-BIZ Center varies greatly, depending on the high impact ICT applications. However, in general, e-BIZ Centers vary from \$40,000 - \$200,000, with \$100,000 as an average.

<sup>73</sup> The Global Development Alliance (GDA) is a USAID program that funds public-private alliances with businesses or NGOs to undertake activities to “stimulate economic growth, develop businesses and workforces, address health and environmental issues, and expand access to education and technology.” USAID funding should be matched at least one-to-one by GDA partner resources, of which at least 25% must come from the private sector. In addition to monetary contributions, matching resources can include in-kind contributions, intellectual property, implementation know-how, and technical assistance.

### Example: ICT-Enabled Service Enterprise for Agriculture

**Goal:** Improve competitiveness of an agricultural sector

**Challenge:** Help food processing SMEs and farmers meet:

- Increasingly demanding food traceability and safety requirements of EU and US
- Strict quantity, quality, timeliness requirements of large buyers
- Increase export yields and revenue

**ICT-Enabled Service Enterprise:**

- Utilizes database application to manage services
- Provides traceability infrastructure
- Runs central system that aggregates demand for inputs (facilitating discount purchasing), access to expertise, manage logistics, etc.
- Markets to international customers, providing professional quality service that meets international standards

**How it works:** Participating farmers:

- Use mobile phones or other ICT-enabled devices to input information for central traceability application, enabling these data to be used to increase export yields with more precise farming processes
- Use bar codes or RFID tags supplied by the high impact ICT service enterprise
- Use SMS to receive information on logistics requirements throughout each step of the process
- Use SMS/mobile phone or email to order inputs
- Use SMS/mobile phone or email for virtual extension expertise, e.g., to pose questions re. inputs, disease, etc.

**Results:** Enables small farmers to meet export quantity, quality and delivery requirements, and increase their export yields and revenue, with very low-cost outlays to individual farmers

**High impact ICT to improve NGO effectiveness.** A similar ICT activity in Serbia could extend the concept described above to creating a sustainable ICT-Enabled Services Center for NGOs. The Center would provide *all* NGOs working on a particular issue with ICT applications that improve their effectiveness. The hallmarks of this activity are:

- It *quickly* and *significantly* improves the reach and impact of NGOs working in an area.
- It provides *all* NGOs working in the selected area with affordable access to the high impact applications. Given the small size and limited resources of most Serbian NGOs, this element is crucial to getting widespread improvements
- It is *sustainable*. A strong business plan at the outset helps ensure long-term sustainability

The major steps include:

1. *Start with pressing needs.* The first step is to identify high impact applications that can quickly and significantly improve NGOs' efforts related to a particular objective. The focus can be on areas already supported by USAID projects or other areas related to the mission's SOs. These "pressing" needs can be determined with the same rigor a private business uses in market research to determine strong demand for a potential service.
2. *Facilitate the development of a sustainable for-profit enterprise or non-profit center that offers high impact applications at affordable prices to all NGOs pursuing the specified objective.*

- a. **Co-invest with selected partners.** The activity selects local partners through an open tender. The local partners make financial and/or in-kind co-investments to establish the new enterprise or center, providing a strong incentive for them make a commitment to the enterprise's long-term sustainability. International companies may also make contributions. Local partners can be companies, individuals, or universities.
- b. **Help develop solid business plans that support self-sustainability.** Even a not-for-profit Center needs a viable business plan from the outset to promote sustainability. At the same time, the plan must include offering the ICT applications at affordable prices to the NGOs served.
- c. **Provide hands-on, cutting-edge technology and market expertise.** Those investing in and/or operating the new service center will need capacity-building in management, marketing and sales skills. The activity provides this type of TA in a close, hands-on manner.

The Results: Sustainable enterprises or nonprofit centers that support major advancements in the reach and impact of target NGOs:

- Offer fee-based high impact ICT services to NGOs in a target mission area
- Are flexible and demand-driven, delivering concrete improvements to NGO effectiveness
- Have long-term owner commitment

**Example: ICT-Enabled Services Center to Strengthen NGOs' Advocacy and Services**

**Goal:** Improve the reach and impact of NGOs endeavoring to advocate for reform or provide economic and/or social services

**Challenge:** Help NGOs:

- Expand reach in rural areas, especially relatively under-served communities
- Raise public awareness regarding social/political/economic issues NGOs seek to address
- Increase NGO's sustainability

**ICT-Enabled Services Center:**

- Helps NGOs use ICT to support NGO's social/economic goals and provides new income-generation opportunities to beneficiaries, e.g., database network that uses mobile phones to gather data on NGO concerns and also market survey data on a contract basis to businesses
- Provides advice and expertise on uses of ICT to help achieve NGO goals
- Runs on online email discussion on innovative ways NGOs are using ICT
- Provides data analysis and mapping software to help NGOs identify patterns that improve their service delivery, provide powerful support for policy change, identify areas of special need
- Partners with local and international NGOs to provides a wide range of online training
- Provides e-mentoring services from domestic and international volunteer mentors
- Provides online bench-marking and planning services to NGOs

**How it works:** Participating NGOs use a range of low-cost ICT devices, e.g.:

- Use mobile phones to provide income generation opportunities to a large network of local/rural women who also provide key social/economic/political data
- Use SMS to transmit information, alerts or "911" emergency notices; get automatic updates
- Use ICT-enabled devices to create/obtain maps of patterns that illuminate key issues
- Use the Web to download online training and CDs to disseminate it
- Use Web/email to participate in bench-marking activities and get online TA

**Results:** Enables NGOs to reach out and communicate with beneficiaries in rural areas, quickly obtain key information, ID "immediately vulnerable" areas, generate revenue for a network of beneficiaries and for the NGO, all at very low cost to NGOs and no cost to beneficiaries

### 3.4 SUPPORT ACCESS TO AND USE OF HIGH IMPACT ICTS WITH BENEFITS ACROSS SECTORS

This component utilizes the power of high impact ICT applications to make major improvements *across* industry sectors or Mission Strategic Objectives. The steps are similar to those in 3.3; however, this activity identifies ICTs that *quickly* and *significantly* address major gaps *across* industries or sectors, including education, business, civil society. The activity then creates an ICT-Enabled Services Enterprise that can close the gaps by offering high impact ICT applications at affordable prices to **all** organizations/users in the target group. Each such enterprise receives hands-on TA to ensure it can implement a viable business plan that provides long-term sustainability.

**Cross-sector high impact ICTs.** This component utilizes the power of high impact ICT applications to make major improvements across industry sectors or SOs. The hallmarks of this activity are:

- It *quickly* and *significantly* addresses major gaps and/or demand across industries or sectors, including education, business, and civil society.
- It provides *all users* with affordable access to the high impact applications.
- It is *sustainable*. A strong business plan at the outset plus local co-investment from public and/or private sector helps ensure long-term sustainability

The major steps include:

1. *Start with demand.* Identify high impact applications that can quickly and significantly address felt needs across sectors and/or SOs. The focus can be on industries or can cut across business, civil society, and education.
2. *Create sustainable for-profit Enterprises or nonprofit Centers that offer high impact ICT applications and services at affordable prices to all organizations/users in the target group*
  - a. **Co-invest with selected partners.** The activity selects local partners through an open tender. The local partners co-invest financially or in-kind. Local partners could be government entities, educational institutions, NGOs, businesses or entrepreneurs. The activity would also seek out other co-investment partners, e.g., international companies.
  - b. **Help develop solid business plans that support self-sustainability.** The activity ensures that there is a viable business plan from the outset to promote sustainability. At the same time, the plan must include offering the ICT applications at affordable prices to to all target users.

#### **ICT-Enabled Services Enterprise to Strengthen Business Incubator Network**

The Government of Norway has expressed interest in exploring co-funding of an ICT-Enabled Services Enterprise with USAID – drawing on the Macedonia e-Biz Center model. The enterprise would partner with a network of business incubators (to be funded by the Government of Norway, other donors and GOS) to offer strategic, high impact ICT applications to SMEs across various industries that are served by the incubators. The aim: to provide high impact ICT applications that help the SMEs throughout Serbia compete in higher value-added markets. For example, a cross-industry ICT-Enabled Services Enterprise might offer very high, international quality online management training. (Note: Norway has already committed to co-funding a similar entity in Bosnia).

- c. **Provide hands-on, cutting-edge technology and market expertise.** Whether for-profit enterprise or nonprofit center, those owning the new service center will need capacity-building in management, marketing and sales skills. The activity provides this type of TA in a very close, hands-on manner.

*The Results: Sustainable enterprises or centers that use high impact ICT applications to support major advancements in competitiveness across industry sectors and/or major improvements across sectors, e.g., education, business, civil society.*

- Offer fee-based high impact ICT services to companies across industries or to users across business/education/civil society sectors
- Are flexible and demand-driven, delivering concrete impact on SMEs' bottom line or measurable impact to NGOs' or government efforts
- Have long-term owner commitment

#### **ICT Application for Youth Employment**

Links between the education and business sectors need strengthening. One activity the mission is considering is to use ICT to:

- Offer students the ability to take virtual "employer tours" that provide practical, current information on what specific companies do
- Develop the company tours so that the businesses can also use them for marketing purposes

This activity could also partner with a local firm that co-funds development of the application, which it would have the right to market in other countries. The local firm might also involve students in the application development as interns, with job opportunities for interns who meet certain performance standards.

### **Example: ICT-Enabled Services Center for Youth Employment**

**Goal:** Open new, higher value-added job opportunities for youth and build workforce skills needed for Serbian SMEs to be competitive

**Challenge:**

Youth unemployment rates are high

Young people with technical skills often take jobs that don't utilize their skills

SMEs have difficulty finding employees (youth and others) with the skills they need

**ICT-Enabled Services Center:**

Uses ICT to provide a one-stop-shop center with information on training sources, job opportunities and requirements; job-seeking services; business H/R development services – all in partnership with training/educational institutions and private sector sponsors

- *Identifies job opportunities, using Web, professional online fora, business databases, etc., e.g.:*
  - Continually scans for new job markets, especially in higher value-added niches
  - Provides online reports on up-coming demand and 2-3 year trends, e.g., labor shortfalls in US & EU
  - Interactive website “markets” Serbia’s capabilities among US and EU companies in expanding industries
- *Links training/education with business needs, e.g.:*
  - Builds capacity of training/education institutions to use ICT, e.g., to offer online courses on subjects for which professors are not available
  - Links international online training companies with a country-wide network of Serbian providers to expand high quality training nationwide, especially in rural areas
  - Facilitates communication between education and domestic/international business communities, e.g., online events and roundtables, internship match-making, short online business surveys
  - Provides training/education institutions with automated updates on int'l and domestic demand for skills
  - Partners with US businesses to provide virtual “study tours”
  - Runs “micro-scholarship” programs that provide online life-long learning opportunities, funded by revenue from municipal land grants
- *Provides support for job placement and entrepreneurship, e.g.:*
  - Database provides “head-hunting” for all types of jobs
  - Interactive website does match-making between Serbian companies and international firms seeking specific skills
  - Services to job-seekers, e.g., online career testing, career counseling, employment services
  - Services to prospective entrepreneurs, e.g., e-mentoring
- *Serves businesses*
  - Provides ICT-enabled tools businesses can use to attract both job candidates and customers
  - Advises Serbian firms re. ICT tools for in-service executive and human resource development
  - Online information and assistance on international certification and standards requirements
  - Create “virtual businesses” linking small companies so they can take on large contracts

**How it works:**

The Center’s information/services are either sponsored by businesses or fee-based, e.g.:

- Youth and unemployed use the Center’s job or training referral databases that are sponsored by businesses
- Youth, unemployed, and businesses use fee-for-service offerings, e.g., “head hunting,” career counseling, e-mentoring, with fees on a sliding scale
- Companies contract with the Center for matching individuals with opportunities and other services
- Universities, secondary schools and government agencies use online services sponsored by businesses or donors
- Training institutions pay a membership fee to be included in the Center’s database

**Results:** Enables youth to get high value-added jobs or become successful entrepreneurs; strengthens workforce skill base in areas that improve competitiveness of SMEs; improves links between educational and business communities.

## APPENDIX A. CHART 1: SUMMARY OF THE ICT ASSESSMENT SWOT ANALYSIS.

Chart 1. SWOT Analysis Summary

<b>Strengths</b>	<b>Weaknesses</b>
<p><u>Telecommunications Legal and Regulatory Environment</u>  <b>Good ICT-related laws</b>  <b>Independent regulator</b>  <b>Private sector pressure for an open market</b>  <u>Telecom Infrastructure</u>  <b>Good phone access</b>  <b>New broadband access</b>  <b>Good mobile phone networks</b>  <b>Competitive mobile industry</b>  <b>Competitive ISP sector</b>  <u>ICT Industry</u>  <b>Strong software development sector</b>  <b>International corporate presence</b>  <u>The Commercial, Government and Civil Society Market for ICT</u>  <b>EU market potential</b>  <b>Large e-government market</b>  <b>Relatively strong NGO demand</b></p>	<p><u>Telecommunications Legal and Regulatory Environment</u>  <b>RATEL needs strengthening</b>  <b>No ICT Ministry</b>  <b>Problematic government investments</b>  <u>Telecom Infrastructure</u>  <b>Poor broadband access</b>  <b>Limited wireless broadband</b>  <u>ICT Industry</u>  <b>Inadequate management skills</b>  <b>Small companies</b>  <b>Workforce limitations</b>  <b>The wrong branding</b>  <u>The Commercial, Government and Civil Society Market for ICT</u>  <b>Obsolete technology</b>  <b>Low public demand</b>  <b>Limited SME financial resources</b>  <b>Lack awareness of ICT strategic benefits</b>  <b>Serbia is a latecomer to the international market</b></p>
<b>Opportunities</b>	<b>Threats</b>
<p><u>Telecommunications Legal and Regulatory Environment</u>  <b>RATEL can open the market..</b>  <b>Eager and competent competitors.</b>  <b>National Investment Plan</b>  <u>Telecom Infrastructure</u>  <b>Major broadband expansion</b>  <b>Willing and able competitors</b>  <b>Broadband via mobile phones</b>  <u>ICT Industry</u>  <b>Build on outstanding firms</b>  <b>Pursue open-source software development</b>  <b>Take advantage of e-Government opportunities</b>  <b>Partner with international firms</b>  <b>Strengthen business-education links</b>  <u>The Commercial, Government and Civil Society Market for ICT</u>  <b>Strategic ICT use among SMEs</b>  <b>Market for e-government</b>  <b>Public responsiveness</b>  <b>National Investment Plan</b>  <b>FDI promotional activities</b>  <b>NGO strategic ICT use</b>  <b>contributions across development activities</b></p>	<p><u>Telecommunications Legal and Regulatory Environment</u>  <b>RATEL fails to open the market</b>  <u>Telecom Infrastructure</u>  <b>Telekom Serbia becomes further entrenched</b>  <u>ICT Industry</u>  <b>Brain drain</b>  <b>Poor business-education links and education inertia</b>  <u>The Commercial, Government and Civil Society Market for ICT</u>  <b>De facto monopoly could become further entrenched</b>  <b>Stagnating market could discourage ICT investment</b>  <b>Digital divide could grow</b></p>

## APPENDIX B. USAID/SERBIA STRATEGIC FRAMEWORK

**Mission Statement:** USAID programs seek to support Serbia and Montenegro in their goal to be democratic, prosperous, and moving towards Euro-Atlantic integration

### Strategic Objective 1

Democratic governance of the market economy strengthened

### Strategic Objective 2

Enterprise growth increased in high potential sectors and municipalities

### Strategic Objective 3

Risk of political instability reduced

#### Critical Assumptions:

*Regional stability does not decline into violent conflict;  
Kosovo final status does not destabilize neighboring areas;  
The result of Montenegro referendum does not destabilize relationships within Montenegro and between Serbia and Montenegro.*

#### Specific to Serbia:

*ICTY cooperation is adequate for continuation of USG assistance;  
The new constitution, if any, is compatible with democratic governance.*

Cross Cutting Issues: Gender, Anti-corruption, Youth, Job Creation, Public Information/Media, Cross-border Initiatives and Human Capacity and Institutional Development

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