Showcase Europe Guide to the European Information and Communication Technology Markets

February 2004

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How to use this guide

The Showcase Europe guide gives a general overview of the Telecom, Software and Hardware markets in each European country. It is designed to help you determine which countries hold the best prospects for your company. For further information on a particular country feel free to contact the commercial specialist listed at the end of that country's report.

Introduction

European Union (EU) level initiatives help shape the region's electronic communications market in ways businesses cannot ignore. An understanding of the direction and scope of developments in EU policy and regulation can help US companies prepare for and take advantage of their market impact. What follows is a non-exhaustive overview of some key recent developments. It covers broad-based policy initiatives as well as specific EU rules relating to electronic communications products and services.

eEurope – a new focus on secure broadband connections

To promote the take up of information and communications technologies the EU launched the eEurope initiative in 2000. It aimed to get every citizen, school and business online. Its latest incarnation, the eEurope 2005 Action Plan, recognizes the progress made in internet penetration levels and aims higher with a focus on stimulating secure services, applications and content based on widely available broadband infrastructure. Its approach is two pronged with attention given both to the take up of broadband (demand) and the roll out of requisite infrastructure (supply).

On the demand side the focus is on encouraging e-Government, e-Learning and e-Health initiatives as well as removing the remaining barriers to e-business. On the supply side, in addition to boosting security through the creation of a European Network and Information Security Agency, the European Commission highlights the key role to be played by the EU's new regulatory framework for electronic communications. Its successful implementation and enforcement is seen as the key to encouraging a competitive electronic communications market that can help deliver competition over multiple networks and platforms.

New rules governing electronic communications services

The previous regulatory regime focused on preventing dominant incumbent operators from using their power to restrict access to markets whereas the new system aims to withdraw regulation where effective facilities based competition exists. The new rules are designed to be future proof by covering all communications networks including fibre, satellite and wireless, and by providing regulators the flexibility to respond to market and technological changes.

The Framework Directive underpins the new system and defines the role of National Regulatory Authorities. It is accompanied by four specific Directives covering: licensing; access and interconnection; universal service and user rights; and data protection. Member States had until 25 July 2003 to implement each of the Directives with the exception of the last whose deadline was set back to the end of October 2003, because of delays in its approval. The majority of the EU's 15 Member States have missed the July deadline prompting the Commission to threaten legal action if the situation has not improved by end of this year.

How the new rules will work in practice

The European Commission's "Recommendation on Relevant Markets" identifies eighteen product and services markets that it considers potentially uncompetitive, including wholesale broadband access and voice call termination on individual mobile networks. National Regulatory Authorities in each Member State must assess whether effective competition exists and whether regulatory measures need to be maintained, withdrawn or introduced in these markets.

Their analyses and conclusions will draw on the Commission's "Guidelines on Market Analysis and the Calculation of Significant Market Power". Under the previous framework an operator was generally subject to requirements such as cost oriented interconnection if it held more than 25% of the market. Under the new rules an operator will be presumed to be dominant if individually or jointly with others, it enjoys a position of economic strength giving it the power to behave "to an appreciable extent independently of competitors, customer and consumers".

While the remedies an NRA chooses to apply are at its discretion and dependent on local circumstances, a new European Regulators Group (comprising National Regulatory Authority representatives) has been set up to encourage a consistent approach on this and other areas of enforcement. Consistency of approach will be a key issue for new entrants considering the future roll out of infrastructure or services on a pan-EU basis.

Radio frequencies

Although the European Union does not allocate spectrum, it is increasingly involved in trying to ensure that allocation by individual Member States, and coordinated allocation through the European Conference of Postal and Telecommunications Administrations (CEPT), takes account of EU policy objectives, such as the eEurope 2005 Action Plan. Member States meeting at the European Council in March 2002 stressed the importance of developing multiple broadband access platforms including wireless. A recent Commission Communication (April 2003), stressed support for alternative broadband infrastructure platforms and argued for a globally harmonized status for radio local area networks.

The 2002 Radio Spectrum Decision (676/2002/EC), which is part of the EU's new regulatory framework for electronic communications, should make it easier for the Commission to help coordinate Member State spectrum policy. The Decision includes the setting up of a Radio Spectrum Committee (RSC) that will assist the Commission in the development and adoption of technical implementing measures aimed at ensuring harmonised conditions for the availability and efficient use of radio spectrum.

Product approval requirements

Manufacturers of electronic communications equipment need to be aware of mandatory requirements for radio telecommunication and terminal equipment (RTTE), low voltage (LV) equipment as well as electromagnetic compatibility (EMC). In order to bring such products on the EU market, the manufacturer has to ensure that all essential safety and health requirements as described in the annexes of relevant EU legislation have been met, apply the CE mark and establish a declaration of conformity. Depending on the level of risk, manufacturers can self-declare conformity.

Where the services of laboratories are required for tests and certification, manufacturers will be able to select an accredited U.S. based test laboratories or an EU based notified body under the terms of the U.S./EU Mutual Recognition Agreement (MRA) for RTTE, and EMC. Tests to EU requirements by a U.S. "conformity assessment body" (term for test lab under the MRA) will be accepted without additional requirements, and vice versa. The MRA is not about accepting FCC certification in the EU, or CE mark in the United States.
The advantage of EU harmonization is that manufacturers are now dealing with one set of rules rather than fifteen. As the EU is expanding, pre-accession countries are in the process of adopting EU product legislation, creating an even bigger market. For instance, the PECA agreements (Protocol to the Europe Agreements on Acceptance of Industrial Products and Conformity Assessment) with Hungary, the Czech Republic, Latvia, Lithuania, Slovenia and the Slovak Republic cover electromagnetic compatibility and low voltage. In addition, the EEA countries (Liechtenstein, Norway, and Iceland) have aligned their legislation although these countries are not members of the EU.

The regulatory environment is not static, as legislators amend or consolidate existing legislation or propose new mandatory or voluntary schemes. Although it is still in the very early stages, manufacturers should be aware of upcoming legislation affecting certain electrical and electronic equipment. Like other new approach directives such as the RTTE, EMC and LV, the proposed EuE (Energy Using Equipment) Directive would lay out a framework offering manufacturers the possibility of self-certifying conformity to essential environmental requirements.

Standardization to set levels of exposure to electromagnetic fields (EMF) from equipment and establish test methods is ongoing. U.S. manufacturers based in the EU are encouraged to work with their associations to monitor progress and implementation, and if possible, participate in the standardization process through national standards bodies.

While compliance with EU product approval legislation is obligatory for any product targeted at the regions' markets, the new eco label scheme is voluntary. It aims to distinguish products that are environmentally friendly. Once competent bodies in the Member States and the Commission have awarded an Eco-Label, a product may bear the Eco-Label sign, and be sold and recognized throughout the European Union. Following recent revisions to the scheme services are now also eligible for endorsement. The new eco-labeling scheme is not self-declaratory, but involves tests performed by competent bodies.

Collection and recycling requirements in the pipeline

The new Directive on Waste Electrical and Electronic Equipment (WEEE - 2002/96/EC) must be implemented into national law by August 2004 and will make producers responsible for the collection and recycling of electrical and electronic equipment from 13 August 2005. The WEEE Directive is complemented by further legislation that will restrict the use of certain hazardous substances in electrical and electronic equipment from 1 July 2006. (ROHS - 2002/95/EC). The Directive's targets include lead, mercury, cadmium, hexavalent chromium, and flame-retardant PBBs and PBDEs.

Tariffs

The EU applies a Common Customs Tariff to imports of goods across its external borders. Once in the EU goods move freely and are not subject to additional tariffs. As a signatory to the WTO's Information Technology Agreement the EU committed itself to eliminating tariffs on a wide range of IT products including computers, software, electronic components and networking and telecom equipment by 2000.

EU Procurement Rules

Procurement by telecom utilities is covered by the 1993 Utilities Directive, which discriminates against US suppliers in two ways. In theory it allows contractors to set a local content requirement of 50% and it specifies that preference must be given to EU bids over non-EU bids unless the latter are more than 3% cheaper. However, the Utilities Directive states that when there is effective competition in the EU telecommunications services market, purchasing entities will no longer be bound by its detailed provisions.

The European Commission's view, elaborated in a Communication issued in May 1999 and further detailed in 2001, is that sufficient competition does now exist in all EU Member States. As a result, the Commission published "for information only" a list of telecommunications services covering 12 EU member states to be excluded from the scope of the Utilities Directive. Preliminary research suggests that the affected telecom operators are altering their procurement behavior as they are no longer obliged to follow the Utilities Directive.

In a further development the Commission has proposed a package of reforms to procurement legislation that includes a formal exemption of the entire telecommunications sector from the Utilities Directive. The reforms are unlikely to be approved before 2004.

Austria

Telecom

Telecommunication services, which amounted to € 6.288 billion ($ 5.945) is the largest sector within the telecommunications market. It accounts for 75.9 percent of the total market in 2002. Since the deregulation of the Austrian telecom market in January 1998, a total of 129 fixed line licenses have been awarded (67 for leased lines and 62 for fixed voice telephony), in addition to 353 licenses for "notified services" which includes Internet services, Audiotext, and private networks. As a result, the kind of disputes between incumbents and new license holders typical of newly deregulated markets have characterized the last few years. This has culminated in the former Austrian regulator, Telekom Control, mandating Telekom Austria to lower interconnection fees and retail call rates.

While local loop unbundling has been officially in place since 1999, progress has been predictably slow, with many amendments to the original legislation having been necessary in reaction to the realities of implementation. One of the more progressive aspects of the Austrian experience however, has been the commitment to pre-planned gradual declines in access charges, from € 12.35 in 2002 to € 10.90 from January 2002. The development of this process now falls under the remit of the new regulator, RTR GmbH.

Despite increased competition and rate cuts, the fixed-line telecommunications area was able to show moderate growth of 1.7 percent, mainly due to increases in Internet and online services revenues. There were 3.2 million fixed lines in service at the end of 2002 (including about 512,480 ISDN lines). This denotes a penetration rate of 41 percent. While the number of fixed access lines operated by Telekom Austria has been declining in recent years, as customers opt for ISDN lines or replace their fixed line with a cellular subscription, the number of cellular subscribers has increased dramatically.

The Austrian mobile market has been competitive, but over the last year the market has shown signs of saturation. This has been demonstrated by the need for some operators to restructure their operations. The market continues to be led by Mobilkom Austria, followed by T-Mobile (formerly max.mobil), Connect One, and the new entrant tele.ring.

However, given the size of the country it is difficult to see how it could sustain four existing operators, two potential new 3G entrants (though Telefonica has decided to suspend operations in its Austrian subsidiary due to financial difficulties) and an MVNO. Tele2 has entered the Austrian mobile market following an agreement with Connect One. Over the past year, the operators tried to penetrate the GPRS market and provide innovative offerings based on SMS such as gaming and information services.

In 2003, we will see operators differentiating themselves through their service offerings, which will include, m-commerce, location-based services, and MMS. In 2002, there were 6.831 million cellular subscribers registered in Austria, which amounts to a penetration rate of 83.6 percent, compared to 6.604 million in 2001 with a penetration rate of 81.0 percent. Experts forecast that the Austrian mobile market will grow to more than 7.3 million subscribers by year-end 2006, which represents a penetration rate of 89 percent.

The market leader is Mobilkom Austria with a share of 42.9 percent, followed by T-mobile (formerly max.mobil) with 33.1 percent, Connect Austria with 20.3 percent, and the US owned tele.ring with 3.6 percent. Austria's mobile phone services recorded a growth rate of 10.9 percent over 2001 with sales topping $2.6 billion in 2002. While six companies (the four already active operators plus the Spanish Telefonica and the Hong Kong based Hutchinson concern) were granted licenses to operate third-generation (3G) Universal Mobile Telecommunications System (UMTS), it seems highly improbable that the Austrian UMTS market will support this number of UMTS operators.

Wireless LAN will be of increasing importance in the next few years for carriers that will start with the utilization of visitor-based networks ("Hot Spots") for high-speed Internet access in order to generate service revenue. This will ultimately slow down investments in 3G. Mobile number portability (MNP) is currently not implemented in Austria. It is expected that MNP will be introduced from July 2003.

The telecom services sector is largely liberalized, well developed and extremely competitive. Licenses are required for wire-bound public voice telephony, public offering of line leases, and wireless voice telephony. A single simple registration requirement applies to all other telecom services. The convergence of mobile phones, Internet, TV, satellite and cable offer a potent mix of new services especially to American firms who are the most experienced suppliers for many of these services. U.S. telecom services providers present in Austria include Abovenet Communications, Airpage, AT & T Global Network Services, Equant Network Services, Facilicom International, tele.ring, UPC Telekabel, and WorldCom.

Hardware

The Austrian market for computers and peripherals declined by 4.6 percent in 2002 from 2001, reaching $1,990.5 billion (EUR 2,105.5 billion). PCs dominate computer hardware sales with a market share of 74 percent or about $945.4 million (EUR 1.0 billion). Approximately 525,390 PCs and workstations were sold in 2002, a 10.5 percent decline in volume from 2001.

Mainframe sales reached $26.8 million (EUR 28.3 million) in 2002, mid-sized systems $107.7 million (EUR 113.9 million), and low-end systems amounted to $181.9 million (EUR 192.4 million). Data communications equipment sales reached $182.0 million (EUR 192.5 million), a decline of 2.6 percent from 2001.

For 2003, the highest growth rates are forecast for mid-sized systems (11.2 percent) and low-end systems (7.1 percent). Mainframe sales will increase by approximately 2.6 percent in 2003.
Business spending has been affected by the overall economic slowdown and is not expected to recover before the end of 2003. As a result, commercial desktop sales declined sharply, and notebook shipments grew slightly.

On the consumer side, the focus clearly shifted to notebooks, as lower prices continue to attract more and more individual users. Consumer notebook sales recorded strong triple-digit growth. 2003 has also seen the growing share of the local firm Gericom.

Driven by aggressive pricing strategies and product positioning, the mobile PC market remained very competitive, with all vendors aiming at gaining share in a market that still presents a huge potential for growth. The adapting to 64-bit computing will slowly proceed. While companies like Hewlett Packard move forward with the application development for 64-bit, it is expected that users will move to 32-bit alternatives with 64-bit expansion possibilities if these options will be available. Full 64-bit use for commercial applications is expected for the second half of this decade.

The United States is the main source of imports, followed by Germany. Overall, sales for the entire computer hardware sector are expected to decline by 0.9 percent in 2003.

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Broadband Internet connections in Austria grew strongly in 2003 to 244,000, an increase of 26 percent compared to 2002. Revenue for broadband Internet access in 2003 totaled USD 92 million, an increase of 23 percent vis-à-vis 2002. Main drivers for this increase in uptake were higher availability, more product choice in general and the availability of more affordable products in particular, a more efficient provisioning process and a higher awareness of broadband amongst end users.

Now that the broadband market is maturing, more and more operators are expanding their product portfolio. They are differentiating through the introduction of products on the high end and the low end and of their portfolio and products especially targeted towards business users. There are three levels of competition in the Austrian broadband market: the infrastructure level, the network level and the retail level. On the infrastructure level DSL is the leading technology. On the other two, the incumbent operator and their ISPs are leading players.

In the longer term, the positive influence of broadband specific content and applications will become stronger. Driven by these factors, the Austrian market is expected to grow to almost 436,000 connections in 2007. Revenues will then reach US$ 157 million.

Installed PC Base by Main User Sector (Units)

	2001	2002	2003 (est.)
Home	1,098,000	869,452	838,076
Business	857,000	952,984	937,736
Government	99,000	77,300	79,310
Education	98,000	87,710	87,535
Total:	2,152,000	1,987446	1,942,657

Computers and Peripherals (CPT) Data Table (million $)

	2001	2002	2003 (est.)
Total Market Size	2,038.7	2,038.7	1,997.9
Total Local Production	1,290.9	1,290.9	1,265.1
Total Exports (from Austria)	1,369.6	1,369.6	1,342.2
Total Imports (into Austria)	2,117.4	2,117.4	2,075.0
Imports from the U.S.	119.4	119.4	117.0

2002 (base year) exchange rate: $1 = € 1,0578
Note: The above statistics are unofficial estimates.

Software

In 2002, total packaged software sales reached approximately $1.161.6 billion (EUR 1.228.7 billion) of which application software represented $551.8 million (EUR 583.7 million) and system infrastructure software represented $317.1 million (EUR 335.4 million).

In 2002, the value of IT Services totaled $2.618.4 billion (EUR 2.769.6 billion). Of this total, operations management accounted for $905.2 million (EUR 957.5 million); implementation $580.6 million (EUR 614.1 million); support services $625.3 million (EUR 661.4 million); IT consulting $317.2 million (EUR 335.5 million); and training and education $190.1 million (EUR 201.1 million).

The expected annual growth rate for 2003 will be 4.9 percent for software and 7.3 percent for services. In 2004, the annual growth rate is estimated at 12.4 percent for software and 7.9 percent for services.

It is critical that software be "user-friendly" whether marketed to personal users, business professionals or executives. It is vital that the software be "bug-free" and preferably written in German. Software packaging is important for retail sales and should be in German.

The market for databases is growing, especially as Austrian companies develop e-commerce sites, and as larger firms discover the advantages of enterprise-wide information management, which are still new ideas to many in this market. Sales of networking software amounted to $89.8 million (EUR 949 million) in 2002, and are expected to grow at about 11.5 percent annually in 2003, 2004, and 2005.

While Linux software shipments will be stagnating in 2003, Linux will be competitive with RISC-based Unix-systems. Hardware suppliers like Dell see good market potential for Linux in the low-end segment.

The best opportunities for sales of U.S. software in Austria appear to be in Internet systems engineering and applications consultancy, data bank and communications software/office automation, education, CASE, CIM and quality control. The primary end-users are industry, financial services, public administration, trade, health, energy production, distribution, and electronic banking.

Computer Software and Services (CSP) Data Table (million $)

	2001	2002	2003(est.)
Total Market Size	3,548	3,780	4,029
Total Local Production	n/a	n/a	n/a
Total Export (from Austria)	n/a	n/a	n/a
Total Imports (into Austria)	n/a	n/a	n/a
Imports from the U.S.	1,849	1,978	2,116

2002 (base year) exchange rate: $1 = € 1,0578

Note: The above statistics are unofficial estimates

Belgium

Telecom

Market Players
During 2001 and 2002, the telecommunications sector in Belgium landed in deep crisis and experienced an extensive reshuffle among market players. Consolidation and cost-cutting strategies by telecom companies active in the Belgian market have come to the fore and new business models are starting to become clear. Pressure on market players for profitability and productivity is extremely high. All operators are refocusing their energy from acquisition to increased customer base value.

In this turmoil, during 2002, the telecommunications services sector in Belgium still managed to register overall growth of 4 percent and is estimated at about USD 7.1 billion. Growth can be attributed principally to the continued strong performance in mobile services, and data and Internet traffic.

While the number of telecommunications licenses in Belgium in 2002 still amounted to 67, by March 2003 only 29 were still active in the market. The majority of the current market players are clustered around major groups including Belgacom, KPN, France Telecom, and Suez. There are fewer newcomers in the market than during the first four years after the liberalization of the Belgian telecommunications market and their impact on the market is rather limited. Whereas the majority of new market entrants used to come from the United States, now, initiatives are coming principally from other countries.

Despite strong competition, Belgacom, Belgium's incumbent operator, continues to hold a strong market position with a dominant share in several market segments. The incumbent is one of the few remaining telecom operators with no debt and a solid balance sheet. The Belgacom Group reported a turnover of over 5.22 billion euro for 2002, its smallest growth in income since it became an autonomous public enterprise in 1992. Belgacom's new CEO recently announced his strategic "Horizon Project" that aims to prevent the diminishing of receipts and to finding new revenue.

Government Role
The Belgian telecommunications market has been open to competition since January 1998. Liberalization has been a success, bringing many new services and products to end users at low prices. Carrier Pre-select has been available for almost three years and is a success. However, all Other Licensed Operators (OLOs) anticipate a successful unbundling of the local loop as the true solution for full liberalization. At the end of the first quarter of 2002, only 333 lines were effectively unbundled, which is minimal in comparison to the nearly 5 million lines in use in Belgium. Many OLOs do not agree with Belgacom's approach and have accused the government of doublespeak as Belgacom's major shareholder and as custodian of the Belgian telecommunications regulator BIPT.

To remedy this situation, the Belgian government recently reformed the telecommunications regulator BIPT into an independent regulatory authority, which is independent from the Minister in charge of telecommunications. The government's plans to further privatize Belgacom are likely to materialize in the coming years after being put on the backburner in view of the unfavorable investment climate in the telecommunications sector. Press reports are advancing the possibility that Belgacom shares will soon be traded publicly.

On April 24, 2002, the European Commission adopted a new regulatory framework for electronic communications that aims to reform the current European legal framework for telecommunications. This Telecommunications Package includes four specific directives on licensing, access and interconnection, universal service and user rights, and data protection. These should have been transposed into national laws by the member states by July 24, 2003. Due to Belgian national elections in May 2003 and the subsequent formation of a new federal government, implementation of the telecom package in Belgium is now not expected to take place until at least the end of 2003.

Infrastructure and Technology

Belgium is a highly developed market with a diversified economy that is heavily reliant on international trade. The country, despite its small size, ranks as the 11th largest commercial power worldwide and is the United States ninth largest trading partner. It is blessed with one of the most open economies in the world with intense international competition. Belgium is a technologically advanced country with excellent transportation and telecommunications infrastructures.

According to IDC, the global market intelligence and advisory firm in the information technology and telecommunications industries, the overall Belgian fixed-line market will continue to grow during 2003 to reach almost 2.9 billion euro and would exceed 3 billion euro in 2004. Fixed-line services would remain stronger than mobile services, which amounted to 2.4 billion euro in 2002. But, Belgian market players are not as optimistic because telecom budgets keep shrinking and large projects remain forthcoming. Top managers of major telecom operators in Belgium do agree that growth in the sector will principally come from data services, especially via IP VPN applications. Price erosion, however, is affecting these revenue streams.

Belgacom continues to be the dominant player in the fixed-line market with an estimated market share of 80 percent. However, as is the case for all operators, the turnover of Belgacom's fixed-line division is declining. In 2002, the turnover for Belgacom Wireline Division amounted to 2.7 billion euro, a 3.6 percent decline compared with the 2.8 billion euro in 2001, when the turnover was already lower than in 2000. Belgacom Wireline had 4.8 million subscribers in 2002 and 517,000 ADSL customers. Belgacom's Enterprise Solutions Division reports that the principal driver of growth in data services comes from IP VPN applications, which increased by 76 percent during 2002 with 6,000 sites connected. For 2003 a further increase of about 35 percent is expected in this segment. ATM and Frame Relay services increased by 10 percent.

Due to the price erosion in the data services, voice services continue to be worth 55 percent of the 1 billion euro revenues of the Enterprise Solutions Division. For its international Internet VPN solutions Belgacom continues to work with Equant (now France Telecom) and AT&T, but this business is rather limited.

Telenet is Belgacom's primary competitor in the fixed-line market thanks to its cable network that reaches 93 percent of the households in Flanders. Telenet is a cable-based telecommunications and Internet company in Flanders with one of the world's largest broadband cable telecommunications networks. In 1998, Telenet started telephony services via its cable network. In May 2003, Telenet counted 250,000 telephone connections compared to 212,000 at the end of 2002. Telenet continues to grow in this shrinking market. However, Telenet remains a small player in the business market segment with 60,000 customers at the end of 2002 and a turnover of 35 million euro, an increase of 17 percent.

Belgacom's major competitors in the business market segment are BT Ignite, Codenet, Colt, KPN Belgium, Versatel, and Worldcom. Belgacom is becoming more aggressive especially in the SME market, which is a less attractive market for OLOs. In 2002, first tariff increases were announced by a number of operators.

Wireless Communications

After three years of fabulous growth in the Belgian mobile telephony market, the growth in this market is stagnating. During 2002, the mobile phone market in Belgium still expanded to 8.1 million users representing 81.4 percent of the Belgian population and an increase of 5.7 percent over 2001. Compared with the penetration rate in other European countries, Belgium's average position among European countries seems to leave room for growth. Currently, the three mobile operators in Belgium are offering internet services, either via I-mode (BASE) or via GPRS (Proximus and Mobistar.) SMS is still the most popular mobile data service, some 84 percent of the customer base has sent at least one SMS. Youngsters have fully adopted the technology and are frequent users. As far as GPRS services is concerned, the usage is still hampered by the low availability of GPRS enabled handsets, which represent only 7 percent of the customer base at the end of 2002. GPRS business penetration will accelerate with the development and standardization of new applications. New value-added services offered by the three Belgian mobile operators include MMS information services, location services, security services, and M2M services.

In September 2003, the Belgian mobile operators are expected to begin the technical launch of their UMTS networks, with the commercial launch expected no earlier than 2005.

There are currently four WLAN operators active in the Belgian market: Sinfilo, Belgacom, Proximus, and Eurospot. Each of them focuses on different market segments for the provision of their services. In addition to the provision of services in homes and offices, there are an increasing number of available hotspots under contract that will go online along the most frequented routes and in public places in Belgium.

For the moment, these include airports, train stations, hotels, restaurants and rest stops along major highways and roads. Services provided by all WLAN operators offer solutions for authentication, billing, management, training, roaming, security and support.

Broadband
Broadband remains the best performing segment in the telecommunications services market. Total internet growth is leveling off due to the decline of dial-up connections, while broadband continues to grow exponentially. The broadband market in Belgium is unique with its strong competition between two dominant players and two technologies. Belgium had approximately one million broadband connections in May 2003, made up of 600,000 ADSL connections and 400,000 cable connections. Belgacom is the leader in the ADSL market. It offers broadband access directly to its customers or indirectly through other internet access providers. Belgacom expects that it will reach 750,000 broadband customers at the end of 2003. In addition, SDSL services were introduced during 2001 and are currently offered in Belgium by four operators Belgacom, Colt, KPN, and Versatel. Business customers are attracted increasingly by the benefits of SDSL.

The second largest player in the broadband market is Telenet, which is only active in Flanders. At the end of May 2003, Telenet had about 350,000 Internet customers compared to the 300,000 at the end of 2002. Telenet claims that it has a 56 percent market share in Flanders, compared to a 44 percent for Belgacom. Other cable companies providing broadband access such as UPC Belgium, Brutele, and Coditel, are much smaller players. Fierce competition has led to relatively low flat rate prices for broadband and fast market penetration. Belgium is now number two on the list of high-speed Internet access connections in Europe in terms of penetration rate of broadband connections compared to dial-up connections and is also one of the cheapest broadband access providers on the European continent.

Future Prospects/Opportunities
Growth in the Belgian ICT market will come more from software, IT and advanced telecommunications services and less from the hardware market. U.S. suppliers of top-of-the-line products and services in these growth areas should continue to find interesting business opportunities in Belgium.

Hardware

Market Players
Roughly half the households in Belgium own a PC and use it regularly. This ratio has remained almost identical to the figures in 2001 and 2002. Sales of laptops in Belgium have increased to 41,516 units for the first quarter of 2003 relative to 61,563 units for the first quarter of 2002. This is a 48% increase. The share of desktops to laptops has changed significantly from 80/20 to 70/30. HP remains the market leader for portable PCs in Belgium, followed by Fujitsu, Sony, Siemens and Acer. HP and Compaq dominate the desktop market, followed by Dell, Fujitsu, HP, NEC, IBM and Apple.

The Belgian computer hardware market is principally an import market, with 85 percent of equipment being imported. Local production of PCs is minimal; however, almost 600 companies assemble PCs in Belgium. Local brands include BMx and Stein. The PCs are assembled with imported components and are built to the specific and constantly changing requirements of the local market. Computer 2000 (Tech Data) has just obtained the contract to assemble PCs for Fujitsu in Belgium. These PCs will be destined to the SME market, which requires a lot of flexibility from the vendor. Fujitsu's "white product" PCs are assembled by several small resellers.

Government Role

The Belgian federal government wants to promote the use of PCs by means of new legislation and incentive programs. Belgacom, HP, Microsoft and Intel have signed an agreement to jointly sell computers and peripherals to companies in Belgium to be used at home by their employees. Studies have revealed that there is a potential market in Belgium for 80,000 new PCs per year and for 300,000 new broadband connections over the next three years.

In 2001, all Belgian residents were issued a social security smartcard. Healthcare institutions, medical practitioners, and pharmacies use the data on the card to electronically update records and perform many transactions electronically. This technology has been implemented successfully and paved the way for a national registry card to be used for administrative operations.

Technology In Use

The Belgian market is open to computer products from all over the world but in particular from the U.S. Computer products with the latest technology of U.S. origin are in demand. Belgian distributors and buyers will travel to the U.S. to find unique computer products or peripherals.

Windows/NT is the standard in the business market. Linux-based environments are gaining market share, particularly in small companies. Unix is still the most commonly used operating system for servers.

According to a Gartner survey in 2001, 62% of Belgian businesses have one or several PDAs, and only 7.7% of the staff use one. No figures are available for the private market, but penetration is likely to be very low.

Market Structure

Belgium has an excellent network of highly qualified computer product distributors. They range from very large distributors with a broad dealer network to small, highly specialized, Value-Added-Resellers. Most American hardware products are sold in the Belgian market through this channel. In addition, many American computer hardware manufacturers have their own subsidiaries and well-established distribution networks throughout Belgium. There is a multitude of other channels including specialized computer shops, department stores, and mail-order houses.

Future Prospects/Opportunities
Mass storage devices, 2.0 USB devices, competitively priced DVD burners, laptops, and home laser printer are best prospects for U.S. exporters. American firms should monitor the European Union's Tender Electronic Daily for upcoming projects:
http://www.buyusa.gov/europeanunion/tender_search.html

Software

Market Players
The Belgian ICT market is small but vibrant with 44% of its 10.2 million inhabitants regular Internet users. ICT expenditure in Belgium in 2002 was 1.610 Euro per capita, which ranks 10th out of 16 OECD countries – this expenditure represented 6.49% of GDP. Relative to the E.U., Belgium has high broadband penetration (20%) and low PC penetration (45%). Most recently, there has been a significant increase in the number of adult and middle-aged Internet-users while the 15 – 24-year-old age group has stagnated. Roughly 50% of SMEs and 80% of the larger corporations have a website.

There are two major ICT associations in Belgium: Insea (Informatics Service Association) an association of systems integrators and service companies, and Besig, (Belgian Software Industry Group) representing software manufacturing companies and packaged software developers. There are roughly 80 ISPs, the three largest ISPs (Skynet, Tiscali and Telenet) together hold 69% of the market.

An estimated 120 companies in Belgium develop software and, a small number of these are international players: Arinso, Capco, Callataÿ & Wouters, Real Software and Ubizen. Of the 3500 ICT companies listed in Belgium, the main systems integrators are: Ardatis, Cipal, Dolmen, Econocom, Systemat, Telindus and Trasys.

Government Role
Belgium's administration has devolved significantly over the past ten years into eight different regional and community governments. Each authority has developed its own e-Government agenda and is increasingly employing large consultancy firms to assist them such as Accenture and PricewaterhouseCoopers.

Progress has slowed since the burst of the ICT bubble in mid-2000. However, much progress has been made in publishing administrative documents to the web; focus is now leaning towards providing online public services and integrating data management and exchange. Due to budget constraints, government resources are very limited.

Market Specificities
Belgium's linguistic fracture has contributed to a high degree of openness and competition. Distributors, developers and systems integrators are expected to customize their product to a certain degree. As a result, many have opted to develop products for niche markets such as software for banking, logistics and human resource management.

Due to insufficient financial resources, many Belgian software houses have been bought out.

Market Driving Forces

Since the global Internet/IT bubble burst in 2000, the driving force has shifted from large projects and packaged software to tailored solutions. Like the rest of Europe, the Belgian ICT market is recovering from the worldwide downturn in the sector, analysts are extremely cautious in their forecasts and many projects have been scaled down, postponed, or cut. Investment over the past year has grown; the software and services market has grown from 4.8% in 2002 to 5.4 in 2003.

Along with the rest of Europe, Belgium had to liberalize its telecommunications market in 1998. Although it was slow and incomplete in implementation, liberalization was sufficient to give a boost to the ICT market. Most of its effects are now becoming apparent, especially in terms of the increased broadband penetration. Belgacom, the former national carrier, has only been partially privatized. It rents its digital lines and black fiber to the 45 other licensed operators. This market distortion has resulted in high telecommunications prices.

The mobile market after some interest is now on the downturn even as GPRS services are being introduced and third-generation UMTS (Universal Mobile Telecommunications System) licenses were awarded to the three established mobile operators: Proximus, Mobistar and Base. Still, only 2% of Belgian Internet users own a WAP (Wireless Application Protocol) mobile access device. This may be due in part to the high mobile telephony costs.

The above mentioned increase in telecom competition, broadband penetration, Internet use, website development, and the desire of SMEs to integrate business processes have been the major driving forces behind software sales and development.

Internet

According to InSites, 25% of Belgians have an Internet connection at home, 47% percent of households now have a PC.

Among home-users in Belgium, the most popular sites on the Internet are entertainment, adult content and news sites, along with travel, computer, and music sites. One in three work-surfers visit news sites. The most popular Internet activity in Belgium is e-mailing and 83% of users do this at least once a week. Twenty-five% of the Internet-users engage in chatting.

As mentioned above, there are roughly 80 ISPs (Internet Service Providers). There are over 1.7 million regular Internet users in Belgium. Recently, there has been a sharp rise in the number of home connections in Belgium. However, the high cost of telecommunications still places a damper on usage, as half of the Belgians who do have Internet access do not make regular use of it.

Broadband is particularly well-developed in Belgium. In 2001, the number of broadband connections overtook the number of 56k connections. Belgium has more broadband connections than any other European country, except for Germany.

E-commerce
Belgium's e-commerce market seems to be on the verge of taking off. However, many analysts believe that real growth is still up to three or more years away.

Belgium is a small market with good broadband penetration and decent PC/household penetration. E-commerce progress however, has been modest; Belgium has the lowest ranking in the E.U. when it comes to purchasing over the Internet; only 16% of people with Internet access made a purchase. By the age 15, 20% of Belgians say they have made an online purchase and 41% bought something offline after studying it on the Internet. Over half the 18-24 age group have purchased something online, usually CDs, books, or software. 34% of parents have bought something online for their teenage children.

eBay Belgium, although operational for several years, has not yet reached the per capita usage of its neighboring countries, The Netherlands, France or Germany. There are no other significant auction websites on the Internet in Belgium. This may be due to a very weak mail-order tradition in Belgium – most homes are within 20 miles of major cities. Furthermore, Belgians are very weary of Internet fraud and data transfer indiscretion. The recent launch of PayPal Europe may quell the former concern.

A further challenge has been the need for e-Commerce platforms to be able to operate in several languages: Dutch, French and possibly English. There are a handful of successful e-Commerce sites: travel, books, recorded media (Proxis), on-line banking and trading (VMSKeytrade). Most successful Belgian e-commerce sites are business-to-business, for example IMES (tools and engineering suppliers), Bricsnet (construction industry portal), and the IT sector itself.

Future Prospects/Opportunities
Best prospects for U.S. exporters are software packages that integrate various applications (preferably without modifying code) allowing them to share data seamlessly; solutions that allow SMEs to maximize their ROI for communication such as VOIP solutions; and Intranet and web-enabled packages. American firms should monitor the European Union's Tender Electronic Daily for upcoming projects: http://www.buyusa.gov/europeanunion/tender_search.html

Contact Information

Ira Bel
ICT Specialist
U.S. Embassy - FCS
Blvd. Du Régent 27

B-1000 Brussels, Belgium
Tel: + 32-2-508-24-34
Fax: + 32-2-512-66-53
Ira.Bel@mail.doc.gov

Source: InSites, INSEA, and EITO.

Bosnia and Herzegovina

Telecom

Market Players
With some 1.5 million subscribers in both fixed and mobile networks, state-owned BH Telekom and Telekom Srpske are the most important providers of telecommunications services (fixed, mobile, data) in Bosnia and Herzegovina (BiH). BH Telekom serves some 900,000 subscribers: 450,000 in its fixed network and 350,000 in its mobile GSM network. Telekom Srpske has about 640,000 subscribers: 300,000 in the fixed network and 340 in the mobile network. Their revenues and profits are significant. In 2002, on the sales of EUR 248 million, BH Telekom's profits reached EUR 74 million. In the same year, Telekom Srpske's profit was EUR 43.5 million on the sales of EUR 142 million. Laggings behind them are HT Mostar with some 100,000 subscribers in its fixed network and Eronet with some 115,000 in its mobile GSM network.

There are 38 licensed Internet Service Providers (ISPs) and 56 network operators. Nevertheless, with some 100,000 subscribers, Internet penetration is extremely low, while network operators are all in a very early stage of development and mostly engaged in cable TV networks. Among the leading ISPs are BH Telekom, Telekom Srpske, HT Mostar, Logosoft, SmartNet 2000, Aneks, Lanaco, Pincom, and EuroproNET.

Government Role
In the last two years, BiH adopted a modern international standard regulatory framework including sector policy, firm legislative basis (Communications Law), independent regulator (Communications Regulatory Agency), licensing framework, rule of interconnection, and preparations for full liberalization.

The Telecommunications Sector Policy sets the main objectives to be achieved by 2005: i) provision of Universal Services, ii) stimulation of development, iii) privatization of state-owned operators, and iv) full liberalization of fixed and mobile services (currently, all services but international voice are fully liberalized).

The Law on Communications (Law) is the major act regulating communications (telecommunications, radio, broadcasting, including cable television, and associated services and facilities) in Bosnia and Herzegovina and the establishment and work of the Communications Regulatory Agency of Bosnia and Herzegovina (CRA).

The Council of Ministers (CoM) is responsible for developing and adopting the telecommunications sector policy and for determining the representation of BiH in the international telecommunications forums. The CRA is responsible for regulating broadcasting and telecommunications networks and services, including licensing, tariffs, interconnection, and defining the basic conditions for the provision of common and international communications facilities. Also, the CRA is empowered to plan, coordinate, allocate, and assign the use of the radio frequency spectrum.

CRA's web site www.cra.ba contains all the relevant information in this regard.

While significant progress was made toward reforming the sector, the issues that still need to be addressed and soon are universal services, tariff rebalancing, interconnection, and privatization. As most of this issues are very political, it is safe to assume that no quick progress will be made any time soon.

In terms of equipment standards, the Law says that any equipment that meets harmonized standards of the European Union shall be deemed legal.

Infrastructures and Technology
Since 1996, the infrastructure has been largely restored and modernized. The switching capacity rose from 272,000 in 1996 to 1,060,000 in 2001. The phone penetration is still low reaching some 25 subscribers lines per 100 inhabitants. The switching capacity exceeds the access capacity. The level of digitalization of the switching capacity is about 70% but with the trend of achieving full digitalization by 2005. The incumbent operators all have international and transit ATM switches connected with fiber optic cables (SDH 155 Mbit/s). The transmission systems are fully digitalized. Today, the technologies such as DSL, ADSL and ISDN are slowly making inroads to the market but still remain too expensive for most subscribers. Telekom Srpske is in the process of building the first MPLS network in BiH.

The leading equipment suppliers are Siemens, Ericsson, and Alcatel. The recent growth of Internet and cable TV networks offered new opportunities for the American manufacturers.

Wireless Communications
Wireless in BiH means GSM 900 Mhz networks but the mobile operators are now considering expanding toward the 1800 Mhz spectrum. It is estimated that about 60% of the territory and 75% of inhabitants is covered with the GSM networks. The CRA requires the operators to increase the coverage of population and territory to 80%, and of major roads to 100% by 2004. Despite this requirement, the growth of mobile communications was significant as the incumbent operators recognized its financial potential. It was the introduction of pre-paid service however that sent the number of subscribers to previously unimaginable levels. Also, there is a need for more wireless local loops or cellular local loops to cover the rural areas that at present do not have access to any kind of telephone service.

Broadband
Broadband access such as ISDN, DSL, and ADSL remains an exclusive tool for reach customers. Some cable TV operators are now joining forces with ISPs to provide fast Internet access but on a limited scale. The prices of these services can be found on the web sites of incumbent operators.

Future Prospects/Opportunities
It is the incumbent operators that still represent the most important clientele for the equipment manufacturers. With both BH Telekom and Telekom Srpske having expressed their wish to upgrade their networks in order to increase their market value prior to forthcoming privatization, it appears that the equipment manufacturers should focus on them.

In 2002, Telekom Srpske obtained a EUR 30 million loan from the European Bank for Reconstruction and Development to finance the modernization of its network. There are currently two tenders still opened for bids: i) Supply of Cellular Local Loop GSM Equipment and ii) Supply and Installation of Equipment for the extension of GSM Network including equipment for multimedia- and short message services (MMS and SMS), equipment for the extension of the radio network, and transmission equipment for the extension of radio network and the backbone network.
Also, BH Telekom appears to have ambitious plans to be achieved by 2005. The company said it would increased the number of subscribers in the fixed network to 650,000; digitalized commutation at the level of 90%; introduce new services such as IN, VPN, and xDSL; and develop a system for centralized management of the network. As far as its mobile network is concerned, BH Telekom said it would increase the number of subscribers to 1,000,0000, put 114 new base stations to improve the coverage, introduce new services such as GPRS and MMS, and expand the network in the 1800 Mhz spectrum. The improvements/introductions in BH Telekom's data network should include the implementation of a multi service network based on the IP/MPLS technology, introduction of VoIP, and introduction of a broadband network using the existing access network (copper).

The United Nations Development Program's ICT Forum reckons that BiH will invest about EUR 400 million in various ICT projects in the next two to three years.

Contact Information (for full list of contacts, please call Edin Fetahovic):

Edin Fetahovic
Commercial Specialist
U.S. Embassy - FCS
Alipasina 43
71000 Sarajevo, Bosnia Herzegovina
Tel: + 387-33-445-700 (ext. 2134)
Fax: + 387-33-219-185
Edin.Fetahovic@mail.doc.gov

Communications Regulatory Agency of Bosnia and Herzegovina
Mr. David Betts C., Director General
Phone: 387-33-250-600 Fax: 387-33-250-650
Email: DBetts@cra.ba
Vilsonovo setaliste 10
Sarajevo, Federation of Bosnia and Herzegovina 710000
info@cra.ba
Web Site: www.cra.ba

Dominant Operators

BH Telecom dd
Mr. Amir Spahic, General Manager
Phone: 387-33-232-651 Fax: 387-33-221-111
Obala Kulina bana 8
Sarajevo, Federation of Bosnia and Herzegovina 71000
Web Site: www.telecom.ba

Hrvatske Telekomunikacije d.o.o. Mostar
Mr. Stipe Prlic, General Manager
Phone: 387-36-395-555 Fax: 387-36-326-443
Email: s.prlic@tel.net.ba
Tvrtka Milosa bb
Mostar, Federation of Bosnia and Herzegovina 71000

Telekom Srpske dd
Mr. Zeljko Jungic, General Manager
Phone: 387-51-240-100 Fax: 387-51-211-150
Email: z.jungic@telekomsrpske.com
Vuka Karadzica 6
Banja Luka, Republika Srpska 78000
Web Site: www.telekomsrpske.com

Eronet Pokretne Komunikacije doo
Mr. Bozo Knezovic, CEO
Phone: 387-39-663-311 Fax: 387-39-663-313
Email: bozo.knezovic@eronet.ba
Tvrtka Milosa bb
Mostar, Federation of Bosnia and Herzegovina 88000
Web Site: www.eronet.ba

Bulgaria

Telecom

Market Players
The biggest market players in the Bulgarian telecommunications market are the Bulgarian Telecommunications Company (BTC), the two GSM operators, the cable TV operators and the ISPs. Following the liberalization of the market in 2003, the role of the cable TVs and ISPs is expected to increase as they start providing high speed Internet and voice telephony services.

Government Role
The Government role in the telecommunications sector in Bulgaria is mainly executed through the Committee on Communications Regulation (CRC) and the Ministry of Transport and Communications (MTC).
The MTC sets state policy in telecommunications and oversees the activity of BTC, which is still state owned enterprise.
The CRC implements the telecommunications policy and regulates the provision of telecommunication services in Bulgaria. The CRC also prepares the documentation and tenders for issuing licenses to companies which provide telecommunications services. The CRC is actively involved in drafting the Telecommunications Act and in the management of the radio frequency spectrum allocated for civilian use.
The CRC has recently issued the first three licenses for telephone services in Bulgaria.

Infrastructure and Technology
BTC, a state-owned enterprise overseen by the Ministry of Transport and Communications, owns Bulgaria's fixed telecommunications network.

The Bulgarian telecommunications market has been liberalized as of January 1, 2003 but BTC is still the main telecommunications operator on the market. On January 1, 2004, BTC will have to introduce cost oriented tariffs and the following year it will be required to unbundle the local loop to give access to the "last mile". BTC is now focusing on increasing the digitalization of the network. Currently it is about 20% digitalized. This is a much lower percentage than elsewhere in Europe.

The long-awaited privatization of BTC will bring investment and speed-up the company's digitalization. At the end of September 2002, Viva Ventures (a wholly owned subsidiary of the U.S. Advent International) and a consortium between Koc Holding and Turk Telecom submitted bids for 65% of BTC. In October 2002 Viva Ventures was selected as a preferred buyer. Subsequently, in March 2003, the Privatization Agency (PA) and Viva Ventures initialed a sale agreement. However, the Supervisory Board of the Privatization Agency initially rejected this agreement. The Supreme Administrative Court later twice supported Advent's appeals but the status of the privatization is still pending as of the date of this report.

Besides BTC's fixed network, Bulgaria has an analog cellular telephone network (450MHz) operated by Radio Telecommunications Company (Mobicom), a joint venture between Cable and Wireless (49 percent), Bulgarian Telecommunication Company (39 percent) and Radio Electronic Systems (12 percent). The future development of Mobicom depends on the new owner of BTC.

Bulgaria also has a digital cellular telephone network operated by the Bulgarian company Mobitel that uses the Pan-European digital GSM standard (900 MHZ). In 2002, a second GSM operator, COSMO Bulgaria Mobile, launched operations of a new service called Globul. By the end of August 2003, the number of subscribers of the two mobile operators has exceeded 2.7 million.

Bulgaria has about 150 Internet service providers. Current dial-up access speeds over regular lines generally offer a reliable connection up to only 33,600 bps. In 1999, BTC introduced ISDN. Currently ISDN is available in the main cities in Bulgaria, where it is mostly used for Internet connectivity. Development of broadband service lags behind ISDN.

Bulgaria's broadcast and cable media are also expanding. Cable TV operators are upgrading their networks in order to be able to provide interactive services such as Pay Per View TV, Video on Demand, cable Internet services and telephony services. These companies are also considering entry into the telecommunications services market and some have already started providing phone services using VoIP technology.

Wireless Communications

Wireless communications are very well developed in Bulgaria. The three mobile telephony operators cover almost all of the country and have a solid base of over 2.7 million subscribers. A third GSM license is expected to be awarded to the new owner of BTC as part of the privatization process. It is forecast that this will further decrease telephone prices and improve the quality of service.
Some of the IT companies are offering wireless LAN that is used by commercial banks and big corporations with complex communication needs.

The CRC is preparing tender procedures to be open at the end of 2003 for 3.5 GHz point to multi-point wireless access band services. Depending on the success, LMDS (28 to 31 GHZ) will be open for use under similar procedures. Bulgaria does consider broadband fixed wireless as an alternative to broadband with good prospects for medium and market development. The broadband fixed wireless service providers do require an operating license and access to frequencies should be awarded by a tender procedure.

Broadband

Broadband services in Bulgaria are beginning to be offered by some of the cable TV companies in Bulgaria.

Future Prospects/Opportunities

The privatization of BTC
Further development of the mobile operators
Further development of the cable TV companies
Further development of the ISPs

Contact Information

Ms. Tsvetanka Kolarova
U.S. Commercial Service
U.S. Embassy
1, Saborna Street
Sofia
Bulgaria
Phone: (359) (2) 963-4062/963-2014
Fax: (359) (2) 980-6850

Hardware

Market Players
Hewlett-Packard, IBM, Compaq, Dell, Gateway, Xerox, and Cisco continue to be among the market leaders in Bulgaria. HP holds a market share of 55.3 percent of the total sales of portable computers in Bulgaria, as of the end of June 2003. The company has sold 2.5 times more portable computers in Bulgaria than the combined total sales of IBM, Fujitsu Siemens, Toshiba and Dell. Toshiba, Acer, and Fujitsu Siemens are the main competitors to U.S. equipment suppliers on the Bulgarian computer market, while the main competitors to U.S. companies for peripherals sales are Canon, Epson, Kyocera, Oki, Brother, UMAX, Plustek and Mustek.

Government Role
The Ministry of Transportation and Communications is considering proposal to create Hi-Tech Parks devoted to the development of the ICT sector. The initiative will both support local IT companies and encourage foreign firms to invest in the Bulgarian market.

Technology In Use
Best sub-sectors for U.S. suppliers include personal computers, servers, laptops, modems, printers and scanners.

Market Driving Forces
The three most important competitive factors in the Bulgarian computer hardware and peripherals market are price, quality, and after sales support. Due to the fact that many of the big sales opportunities are for rather complex Government procurements, U.S. companies have to be prepared to consider offering pre- and post-sales consulting services. That is why American companies that want to enter the Bulgarian IT market should consider establishing a direct presence in the market, or alternatively should appoint a local agent or distributor.

The government, state enterprises, large and small commercial enterprises and commercial banks are highly receptive to U.S. computer technology. The total number of computers in Bulgaria is about 500,000. The installed PC home base is 200,000 units, the installed business base is 190,000 units and the installed government administration base is more than 100,000 units. A conservative 11 percent annual growth is expected over the next couple of years. The growth is expected to come from new market segments like Small and Medium Enterprises and home based units. In addition, there are continuing needs for computers and peripherals for commercial banks, big infrastructure projects, and further information technology needs of the Government administration.

Computers and peripherals in Bulgaria are usually purchased directly from computer suppliers who actively advertise in both specialized and daily newspapers. The biggest end-users in Bulgaria are the Government, municipal and related public sector entities, big commercial banks, large private enterprises, state-owned companies, small companies and individual users.

Future Prospects/Opportunities
The computer and peripherals market in Bulgaria is very well developed. The top 20-25 suppliers dominate a market of about 500 companies. U.S. companies had a 62 percent of the total market in 2003 (total market size: $ 303 mln). They are expected to keep their market share over the next several years but the competition is severe and Asian players will soon try to take more serious percentage. Computer hardware represents 85 percent of the total market and 80 percent of the import market. Peripherals represent 15 percent of the total market and 20 percent of the import market. These proportions are expected to remain unchanged over the next few years.

Software

Market Players
Some of the main local players are: the Center for Automation of Design and Construction Progress, CNSys JSC - Sofia, Applied International Informatics SPLTD, Sap Labs Sofia SPLTD, SAP-Bulgaria SPLTD, and Rila Solutions. The products of major U.S. suppliers such as Microsoft, Oracle, Informix, Novell, and Sun Microsystems are well established and extremely competitive in the Bulgarian software market.

Government Role
The Ministry of Transportation and Communications is considering proposal to create Hi-Tech Parks devoted to the development of the ICT sector. The initiative will both support local IT companies and encourage foreign firms to invest in the Bulgarian market.

Technology In Use
Best sub-sectors for U.S. suppliers include application software, networking software, electronic design automation, CAD/CAM, computer aided engineering (CAE), Internet software, software products which support Wireless Application Protocol (WAP), e-business management solutions, enterprise planning, software for web-design and banking software.

Market Driving Forces
The most important competitive factors in the Bulgarian computer software market are quality, price and financing terms. Also, having a local office or a good local partner is essential in this market. U.S. software firms are beginning to heavily invest in training their customers and local partners in order to encourage quicker adoption of their products.

In 2001 and early 2002, Government IT projects decreased significantly due to the sharp cut in the IT budget of various Government entities. However, several of the large banks have increased their software spending (Bulbank, United Bulgarian Bank, Post Bank, Hebros Bank), as well as the mobile operators Mtel and GloBul. The development of the Bulgarian software market largely depends on the better enforcement of IPR legislation.

Bulgarian software companies do not produce software that competes with U.S. software. The Bulgarian software developers concentrate on market niches that are either specialized or customized for the local market or are localized versions of U.S. products. Bulgarian software companies have excellent development capabilities and highly skilled English speaking programmers. Bulgaria is ranked 8th in the world according to the total number of IT certified professionals and 3rd according to percentage of certificates per capita. There are about a dozen large Bulgarian software companies and 200 smaller software development companies.

Overall, Bulgaria offers good market conditions for U.S. software products. However, a major inhibitor for software companies is software piracy. In Bulgaria, there is a good legal basis for protecting intellectual property, but enforcement of IPR law needs improvement. There are no market barriers on the import of U.S. software products and there are no customs duties on the import of software. A Value-Added Tax (VAT) of 20 percent is applied on all goods sold in Bulgaria, both produced domestically or imported. There is no requirement that the end-user manuals of software products must be printed in Bulgarian. There are regulations of the Bulgarian Consumer Rights Protection (CRP) Commission that broadly describe requirements for end user manuals, packaging and pricing information that should be provided in Bulgaria.

Future Prospects/Opportunities
Bulgaria has a $26 million computer software market that will grow at 18 percent annually for the next two years. The U.S. software products are extremely well accepted for their high quality and innovative solutions. They had 80 percent of the total market in 2003.

Contact Information
Kiro Kirov
Commercial Specialist
Embassy Of The United States Of America
Sofia, Bulgaria
U.S. Commercial Service
1 Saborna Street
1000 Sofia, Bulgaria
Phone: [359] (2) 963-4062
Fax: [359] (2) 980-6850

Croatia

Telecom

Market players
Croatian Telecom (HT), 51 percent owned by Deutsche Telekom, is the incumbent telecommunications operator in Croatia. HT enjoyed exclusive rights to build the fixed network and offer real-time voice telephony until 2003. The Telecommunications Act allows HT to deny other operators access to its local loop until 2005.

As of July 2003, there were ten commercial Internet service providers (ISPs) in Croatia. According to industry estimates, by the end of 2003, some one million citizens, or 22.9 percent (up from 18 percent in 2001) of the population will have access to the Internet. However, the number of paying subscribers is much lower: as of July 2003, 420,000 citizens and 28,000 businesses (out of which 1,000 access Internet via leased lines).

HT's Hinet dominates the market, while the second place is held by Iskon, owned by Adriatic Net Investors Ltd. and CALPers. All ISPs must use HT's infrastructure for customers to access the Internet. Following is a list of the leading operators and their sectors:

Major stakeholders in the Croatian telecom market				
	Sector	Ownership	revenues, USD million (for 2001 if not stated otherwise)	number of subscribers
Croatian Telekom (HT)	fixed voice/data telecommunications	51% Deutsche Telekom, Government of Croatia	520	1,721,139
Cronet(GSM)/Mobitel(analogue)/Bip(pager)	Mobile telecommunications	Subsidiary of HT	150	1,000,000
VIPNET GSM Ltd.	mobile telecommunications	Mobilkom Austria,	140	1,000,000
HT Hinet	Internet	Subsidiary of HT	40 (2001)	255,000
Iskon Ltd.	Internet	Adriatic Net Investors Ltd., CALPers	5	68,000
VIP online	Internet	VIPNET GSM Ltd.	-	22,000
Digital City Media Ltd.	Cable TV	SEAF, SEAF Growth Fund, SEEF	-	45,000
Adriatic Kabel Ltd.	Cable TV	Copernicus Capital Partners Investment fund	-	30,000

Government role

In early 2002, the Telecommunications Institute (www.telekom.hr), an independent regulatory agency, formed a separate seven-member council to decide on licensing and settle disputes between operators. As the Institute and its council have their own source of funding, they are now completely separate from the Ministry of Maritime Affairs, Transportation and Communications. Under the new Telecommunications Act (proposed to the Parliament in 2003) these two agencies would be transformed into a single entity, the Telecommunications Agency.

In 2001, Deutsche Telekom became the majority owner of Croatian Telekom (HT). As HT's exclusive rights to build fixed telecommunications networks expired in 2003, the Government of Croatia invited interested parties to express interest in the concession for the second fixed telecommunications network, and the tender is expected to be published in fall 2003.

Telecommunications technical equipment and installations can be imported, sold, leased, used or installed and connected to telecommunications infrastructure in Croatia if their quality is proven by a certificate of the Croatian Telecommunications Institute or statement of manufacturer's compatibility, which is submitted to the Croatian Telecommunications Institute, and a label as prescribed by separate guidelines. The equipment has to comply with the ETSI (European Telecommunications Standards Institute) and ITU guidelines. If the equipment is not certified, it can be either tested in Croatia or installed with prior consent from the Institute for testing purposes only and for a period not longer than two years.

The entire list of legislation is available on line at www.telekom.hr or www.mppv.hr.

Infrastructure and Technology

Croatia's telecom network is quite advanced both in terms of penetration and equipment (including optical cables, digital equipment, and mobile telephones). There are over 2 million installed fixed telephone lines, or 37 telephone subscriber lines per every 100 inhabitants. International and transit ATM switches are installed in four main centers, which are connected among themselves and with international networks via 7,000 kilometers of fiber optic cables. About 80 percent of switching capacity and about 90 percent of the transmission capacity is digitized, with ISDN and DSL being introduced to households.

Most of the switching equipment deployed in the incumbent carrier's network is of EU origin (Siemens and Ericsson), but with the development of the cable TV and Internet markets, more U.S. manufactured equipment is being imported into Croatia. The focus of service providers is shifting from infrastructure to services, thus offering an opportunity for U.S. engineering and software firms. The telecommunications industry in Croatia attracted significant U.S. investments.

Independent market research firms calculate that 32,739 PCs and 36,142 printers were purchased in Croatia in the first quarter of 2003 alone, representing an increase of 15.8% and 23.7% over the same period in 2002, respectively. Hewlett Packard is the market leader with 18% market share in PC market and 53.4% in printer sales.

It is also estimated that the number of PCs in Croatia is over 700,000. This figure will increase because of the government's program to introduce IT in primary and high schools, for which HRK 110 million (USD 17.5m) is allocated in 2003. HT is joining this project as a sponsor, offering 10 hours of free Internet access per day for each school and discounts for Internet access from home for students.

Although the software piracy rate has decreased from the 1996 level of 79% to today's estimated rate of 67%, it is still a big issue in Croatia. According to market research firm IDC, a decrease in piracy rate of 10% would result in an IT market increase from the current USD 440 million per year to USD 730 million per year.

Wireless Communications

The first digital mobile network (GSM) was launched in early 1996 and today there are two competing mobile operators in Croatia. HT operates two mobile telephone providers, Cronet (a GSM 900 digital network) and Mobitel (an NMT 450 analog network), although the Mobitel network is being phased out. In 1999, another GSM license was issued to an American (Western Wireless)-Austrian-Croatian consortium -- VIPnet. In 2002 Western Wireless sold its share to Austria Mobilkom, which now owns 99 percent of VIPNet. In May 2003, the Council for Telecommunications published a preliminary call for expression of interest for the third mobile phone network concession (GSM, or DCS 1800 and UMTS concessions).

Mobile communications continue to be the leading growth sector in communications in Croatia. In 2002, some 1.5 billion minutes of voice communications were registered in mobile networks, a 38 percent increase over 2001. Domestic calls accounted for 95.4 percent of the figure. Growth continued in 2003, when 405 million minutes were registered in the first quarter, a 24 percent increase compared to the first quarter of 2002. In the first quarter of 2003, 2.5 billion minutes of calls were registered, a 12 percent increase compared to the same period in 2002.

Croatia has allocated an unlicensed frequency band of 2400-2483.5 MHz with limitation on Effective Isotropic Radiated Power (EIRP) equal to 100 mW, and 5725-5875 MHz with EIRP equal to 25 mW. There are no separate allocations for indoor and outdoor uses. A license is required for the use of 3.5GHZ spectrum. Four out of eight Internet service providers in Croatia use commercial broadband fixed wireless (BFW) networks to connect customers to the Internet or to link two different locations of the same customer. Several non-profit associations are offering wireless LAN access to its members in Croatian cities. For a list of local distributors of BFW equipment, please contact the Commercial Service office in Zagreb.

Broadband
Broadband access to Internet is available through ISDN, DSL, leased lines access and cable TV. Prices for ISDN basic access (BRA) are symbolic, while the installation fee for primary access (PRA) goes up to HRK 10,000 or USD 1,500. Monthly subscription ranges from USD 10 to USD 90 per month. Leased line access involves connection charges ranging from USD 600 to USD 4,500 and monthly subscription fees from USD 300 (64Kb/s) to USD 4,500 (2 Mbit/s) and USD 33,000 (34 Mbit/s).

DSL activation fees are approximately USD 270, while subscription packages differ in price, the most expensive costing USD 440 per month (including 12GB traffic).

Fixed wireless access is also available with lower prices compared to leased line access. For instance, the connection fee is USD 600 and the monthly subscription for 2Mbit/s access is USD 3,200 (compared to USD 4,500 for leased line access with the same bandwidth).

One of the cable TV operators, U.S.-owned Digital City Media (DCM), rolled out an alternative Internet access option, via cable TV infrastructure. The offer first became available to 4,800 subscribers in Osijek at a price of HRK 170 – HRK 965 (USD 27-150) per month depending of the package plus a one–time fee of HRK 400 (USD 63). Cable modems can be purchased, rented or leased through DCM.

Total estimated number of broadband users in 2003 is around 40,000.

Future Prospects/Opportunities
The GOC announced plans to issue a tender for the 3rd national GSM network in fall 2003, and issue three UMTS licenses – two to the existing operators, and a third one for the new mobile operator. In spring 2003, the GOC invited interested parties for the expression of interest in the second fixed telecommunications concession, since HT's monopoly in this field expired at the beginning of 2003.

Cable TV operators still offer the best opportunity for US telecom exports. With a dominant player on the market (U.S. owned Digital City Media, www.dcm.hr), it is easier to assess market opportunities. There are now three cable TV citywide concessions, one of them involving the city of Zagreb (770,000 inhabitants), and two countrywide concessions (DCM and Adriatic Kabel, both with U.S. ownership). Providers have shifted priority from network reconstruction and roll-out to acquiring new subscribers. DCM started to offer Internet access to its subscribers in Osijek and is preparing to offer the service in Zagreb in fall 2003.

Information Technology market enjoys annual growth rates of approximately 10 percent and is estimated at USD 440million in 2003. Of this figure, USD 95 million is attributable to software.

Hardware & Software

Market Players

IDC Croatia, a local market research firm, calculated that approximately 100,000 PCs were sold in Croatia in the first three quarters of 2003. Based on this, the estimated total sales for 2003 would be close to 140,000 PCs, an increase of approximately 15 percent compared to 2002. The market is driven by surging sales of laptops and Intel-based server stations, which increased by 56 percent and 49 percent respectively in the first half of 2003. Hewlett-Packard is the leading brand with approximately 18 percent of total sales, followed by a local assembler HG Spot that has a 16 percent market share.

Printer sales followed with an increase of 20 percent in the first half of 2003 (60,422 printers sold by July 2003). Ink-jet printers still represent 74 percent of this figure, and Hewlett-Packard is the absolute market leader with a 49.5 percent market share in printer sales. Epson is second with a 22 percent market share, and Lexmark follows with 13 percent.

Below is the list of top hardware distributors in Croatia and their approximate revenues in 2002:

Distributor	Revenues in 2002, EUR m
M San	80
Recro	48
Elektromagic	26
Megatrend	25
Ve-mil	23
Hermes plus	22
Eurotrade	22
Computech	20
Senso	18
Hg Spot	18

The total value of the Croatian IT sector was estimated at approximately $500 million in 2002, and approximately half of that figure was attributable to hardware. The size of the software market in Croatia is difficult to assess due to a high piracy rate, which was estimated at 67 percent in 2002. Independent researchers estimate that if the piracy rate declines by an additional 10 percent, the total IT market would increase to approximately $800 million.

Enterprise management solutions for manufacturing industries is an area where foreign software suppliers are dominant. The two most visible software suppliers in this field are SAP (EUR 3.7 million in sales in 2002) and Oracle (EUR 4.5 million), and both have local presence.

A variety of local and foreign suppliers offer software solutions for the financial sector; bookkeeping and some specialized solutions (brokerage, bookmaking) are provided by local software manufacturers, while foreign software is dominated in banking.
As local users experience increasing virus damage, anti-virus and firewall systems are entering the market more aggressively. Anti-virus software suppliers with significant market shares are Sophos, McAfee, Computer Associates and Eset.

Government Role
The Government of the Republic of Croatia is relying on the Office for Internet Infrastructure and an academic working group to develop a strategy for the introduction of IT solutions in everyday operations of the central government and local authorities. In effect, the Office for Internet Infrastructure advises the Government on any project or procurement that has an IT component. The Office also drafts laws pertaining to e-commerce (digital signature act, data protection act etc.).

Market Driving Forces
Independent research shows that 37 percent of Croatian households owned a PC in 2003, while the figure for 2002 was 29 percent. This, together with steady growth in the business sector reflected in increasing server sales, represents a solid base for further market growth. New IT technologies are quickly introduced and accepted in Croatia as they appear. Despite the fact that the price of an average PC is equal to the average monthly net salary in Zagreb (capital), the availability of bank financing fuels increasing demand. In fact, 70 percent of households having an income of two times the average salary own a PC. Positive trends both in the hardware and software sectors are expected to continue because of consumer receptiveness to new technologies and government and corporate-sponsored projects for the introduction of IT into Croatian schools.

Contact Information

Miroslav Nikolac
Trade Specialist
U.S. Embassy – FCS
Thomasa Jeffersona 2
10002 Zagreb, Croatia
Tel: + 385-1-661-2026
Fax: + 385-1-661-2446
Miroslav.Nikolac@mail.doc.gov

Note: all figures in U.S. dollars are approximate due to the EUR/USD exchange rate fluctuation.

Czech Republic

Telecom

Telecommunications represents one of the most dynamic sectors in the Czech Republic's ICT market. The Telecommunications network is still experiencing some growth, which is expected to continue.
The main areas of production are as follows: Telecommunication technology and electronic components, representing almost 17 percent of the market. Overall spending on telecommunications equipment and services exceeded 2 billion dollars during the past year. This is mainly due to the expansion of the fixed line network, and the massive use of mobile telephony. Mobile penetration in the Czech Republic is almost 80 percent, overtaking some of the EU countries. The deadline for modernization and digitalization of the network was completed in summer 2002. All exchanges are fully digitalized as of June last year. Czech Republic, being an associate member of the EU, falls in steps with prescribed practices and requirements.
The sale of Cesky Telecom, the largest telecommunication service provider in this country (still owned to a large degree by state) is expected to take place during the year 2005. Far the biggest growth is predicted in the mobile telephony. This market is almost saturated in the Czech Republic. As far, as the mobile telephones go, yet more people still demand the very latest technology on the market.
The market is expected to grow by almost 4.1 percent this year.
A new law concerning the electronic communications is going through the Parliament at the moment.

Market Players
Cesky Telecom
Established in 1994, is the largest telecommunication provider in the Czech Republic, employing 16,000 people. Cesky Telecom is one of the more prominent companies in Central Europe.
The company's structure of ownerships is as follows: 51 percent owned by the National Property Fund, 27 percent TelSource and the rest by other smaller shareholders.
Cesky Telecom provides wide range of services, such as Data transmission, voice services, data transmissions, fixed and leased lines, radio network, Internet, ISDN, VoIP, VoFR, VoATM.
In 2002 , Cesky Telecom's revenue reached USD20.3 million.

Eurotel
Established in 1991, is the leading mobile operator in the Czech Republic, with 2.500 employees.
At the moment, the ownership structure is going through a change. Cesky Telecom owns 51 percent, and is in the process of buying the remaining 49 percent, owned by Atlantic West. As the Czech antitrust office approved the purchase, the transaction is to be completed in December 2003.

Apart from mobile telephony, Eurotel provides voice services, data transmission, radio network, cable, Internet, GPRS, WAP, VoIP, VoFR,VoATM, M Commerce, and Multimedia MMS. In 2002, Eurotel's revenue reached USD18.9million.
Eurotel, as all mobile operators in Czech Republic do, caters to ever increasing demand for SMS services. Czech mobile telephone owners managed to reach the highest number of SMS messages in Europe, for four consecutive months last year. Czech users prefer to use this particular service more, than any other. On average, CR regularly features in 2nd place in Europe, considering this is a country of 10.2 million people.

Radiomobil (T-Mobile)
Established in 1996, second largest mobile operator. These days better known as T-mobile, employing 2.400 people. The year 2002 was very important for RadioMobil. The company became a part of the world group T-Mobile.
Radiomobil owns 60.8 percent, and Ceske Radiokomunikace owns the remaining 39.2 percent.
Beside mobile telephony, the provided services include Data transmission, voice services, data transmission, fixed line, Internet, ISDN, GPRS, WAP, VoIP, VoATM, M Commerce, Multimedia MMS.
In 2002, T-mobile 's revenue reached USD11 million.

Cesky Mobil (OSKAR)
Established in 1999, employing some 1.400 people.
Cesky Mobil is owned by TIW Czech with 94.1 percent, and 5.65 percent CSOB and Canada CR.
Mobile telephony apart, the company offers following services: Data transmission, voice services, GPRS, WAP.
In 2002, Cesky Mobil's revenue was just over USD2.1 million

Ceske Radiokomunikace
Established in 1994, employing 1.300 people.
Ceske Radiokunikace's ownership is as follows, 71.9 percent by Bivideon, and 28 percent together by companies from Netherlands, USA, Czech Republic.
The services offered are Data transmission, mobile telephony, fixed and leased line, Radio network, and Satellite
In 2202, Ceske Radiokomunikace's revenue reached USD1.7million.

GTS Czech
Established in 1991, the company employees 360 people.
GTS is 100 percent owned by GTS Czech (USA)
GTS services include Data transmission, voice services, fixed and leased lines, Radio network, satellite, Internet and ISDN.
In 2002, GTS Czech revenues reached almost USD1million

The remaining Telecommunication Service Providers in the Czech Republic, offering most of the named above services are:

Aliatel, UPC Ceska Republika, TransgasNet, Sitel, Contactel, Intercable Cz, Etel, Tes Media, Pragonet

Broadband
Czech Republic will seek a cut in the VAT rate for broadband Internet after joining the EU, in May 2004.
Internet has became crucial business platform, connecting customers, partners, suppliers, and employees. The first generation of e-business applications focused on navigation and speed, while the second generation emphasizes security.
This offers opportunities to companies delivering innovate security solutions.
Key products and components include: firewalls, Virtual Private Networks (VPN), Anti-virus protection, intrusion detection, authentication, encryption and the PKI (public key infrastructure). Management services include risk assessment, attack detection, and loss prevention.
Eurotel, together with Ericsson began testing UMTS last winter. Eurotel's licence requires it to launch the service commercially in 2005.
Cesky Telecom will increase the speed of its basic ADSL from 192 kbs to 512 kbs from mid-September 2003.

Future prospects / Opportunities
The best considered prospects in the Czech Republic are: Networks and wireless equipment, data service, voice service, video conferencing equipment, video telephones and faxes.

Hardware

Market players selling PCs, Macs, monitors, components, laptops, palmtops, serves, mainframes, accessories and Networks & components are:
Microsoft s.r.o. (introducing Systems Management Server 2003), eD'systems Czech, AutoCont CZ, SWS, Vikomt CZ, PVT, S&T Ceska Republika, Your System, CompuSource/MacSource, Dialog MTS, AgrodatCZ, Unicorn, AT computers, Hewlett-Packard, Apro, ProCA and REKONix.

Government
Government's role is a supportive one. Czech Republic, after joining the EU, will participate in the implementation of the European Plan for action for the Information Society, known as "e-Europe". Program "Internet for Schools" started three years ago. IT Ministry, established in January 2003, is aware of the need of people's computer literacy.

Technology
used in the Czech Republic: PC – Intel based, Serves; windows NT Platforms, Unix
Brands sold: Sun Microsystems, IBM, HP, Cisco, WD, APC, 3Com, Dell, Intel, Epson, Xerox, Minolta, Compaq, Kodak, HP Networking, Canon, Hitachi, Sony, Siemens, Fujitsu,

Market Driving Forces
The banking sector, state authorities and Institutions .New law on electronic communication going through Parliament, requires lot of changes from the authorities.. To a smaller degree, SME is also involved.

Future Prospects / Opportunities
Industry: Banking, building and media sectors,
Government: Computers for schools, computers for regional / local administration, Internet access.

Software

Market players :
SWS a.s. , Oracle Czech s.r.o. , AutoCont CZ a.s. , Unicorn, PVT a.s. , Microsoft s.r.o. T-Systems Czech s.r.o., Digi Trade a.s., S&T Ceska Republika a.s., IFS Group, ITS a.s., London Logic Praha s.r.o., Vema a.s., Aktis a.s., Computer Help s.r.o., Scala CRs.r.o., Fujitsu services s.r.o., Your Systems s.r.o., DCIT, s.r.o., OR-CZ s.r.o., Exprit s.r.o., Stratos Informatic s.r.o., Hewlett-Packard s.r.o., ANF Data s.r.o., Adastra Corporation, Efcon a.s., Merlin s.r.o., Ness CEE B.V. s.r.o., Sun Microsystems Czech s.r.o.

Government
Bill Gates of Microsoft, and the Czech Minister for Education signed MOU in Prague, in January 2004. Microsoft will supply software at reasonable price to primary and secondary schools in socially and economically distressed areas, to promote ‘ digital literacy’. Government supports group of Parliamentarians from across the political spectrum to encourage the population to be more knowledgeable in the IT. Demand and interest in all aspects of IT is still growing.

Technology
Technology used in the Czech Republic: Microsoft, IBM, Sun Systems, Oracle, Lotus, Novell, Citrix, Crystal Decisions, Spectrum, Compaq, DBI Technologies, Symantec, Veritas, eHelp software

Market Driving Forces
Government, Telecommunication, Banking and Security Sectors are the major forces, SME .

Future Prospects / Opportunities
Security Sector: software protection, network protection, software solutions (encryption key, digital signature), data protection. Auto industry.

Contact Information

Luda Taylor
ICT Specialist
U.S. Embassy - FCS
Trziste 15
118 00 Praha 1,Czech Republic
Tel : + 420-257-531-162
+ 420 257-531-163
Fax: + 420 257-531-165
Luda.Taylor@mail.doc.gov

Denmark

Telecom

Market Players
The Danish telecommunication market is fully liberalized and privatized. SBC Communications holds a controlling interest in the former national telephone company TDC (Tele Danmark A/S), and BellSouth holds 46.5% of Sonofon and the remaining part is controlled by Telenor, Norway. Other important telecom companies in the Danish market are Telia (Swedish), and Orange (French). The major third-country hardware suppliers are NEC (Japan), Nokia (Finland), Ericsson (Sweden), and Siemens (Germany). Nortel is the major U.S. hardware supplier, and Motorola has a large facility outside Copenhagen.

Internet subscriptions (2001)		Market share:
CyberCity	112.232	6%
Orange	166.224	8%
TDC	677.322	34%
Tele2	415.946	21%
Telia	146.048	7%
Tiscali	449.532	23%
Others	28.609	1%
Total	1.995.913	100%

ADSL subscriptions
Market share:

CyberCity	14%
Orange	2%
TDC	73%
Tiscali	11%
Others	0%
Total	100%

Government Role
The government has actively encouraged competition in the sector and the market is one of the most liberal in Europe. TDC is the dominant operator in fixed networks due to the ownership of the old public telecommunications network. The company has set the goal of ensuring that at least 95% of the Danish population will be able to access a broadband connection by July 2002. The Danish government has set a range of objectives for Denmark to become one of the most attractive IT-regions in Europe, which include:

To become one of Europe's most innovative IT regions
To build excellent business conditions for hi-tech startups
To offer excellent business conditions for innovation in existing IT companies
To build word class competencies in niche areas

Infrastructure and Technology
The present telecommunication infrastructure consists of copper, co-axial, optical fiber and also various radio based techniques through which PSTN, ISDN, xDSL, ADSL, and GSM services are offered. Cable TV companies are also beginning to offer broadband services via their cables. Denmark's infrastructure is based on the infrastructure of the original national telephone companies, which later became TDC. Since the liberalization of the market, new cable and systems have been added to the present TDC infrastructure.

The Danish National Telecom Authority has designated the former incumbent, TDC, as the universal service obligation (USO) provider from January 1998 to December 2007. Other providers that have a nationwide market share of 50% or more in the provision of services included in the universal service obligation could also be appointed USO providers. That is not, however, expected for a number of years. A USO provider can be compensated for deficits only if the deficits are documented and a public tendering procedure is initiated to appoint one or more alternative USO providers. For international services, there are at least ten operators.

Wireless communications
Denmark awarded its 3G UMTS licenses through an auction, and in September 2001, four winners were announced. They are:

"3" (formerly known as HI3G Denmark A/S) – "3" is 40% owned by the Swedish investment company Investor AB and 60% owned by Hong Kong-based conglomerate Hutchison Whampoa Limited

TDC Mobile International - TDC Mobile International is 41.6% owned by SBC Communications Inc. (U.S) and has de facto control of the entity

Telia Mobile AB - Telia Mobile is a wholly owned subsidiary of Telia AB which is 70.6% owned by the Swedish State

Orange A/S - Orange is 53.6% owned by Wirefree Services Denmark A/S, which is owned 84% by France Telecom. France Telecom is 55.5% owned by the French State

The licenses have a fifteen-year duration and the winning bidders have obligated themselves to cover 30% of the population by the end of 2004 and 80% by the end of 2008. These terms are regarded as very reasonable since most Danes are living close to the larger cities.

Broadband
ADSL was introduced in Denmark in mid-1999, when TDC originally launched ADSL connections with a maximum speed of 512 kbit/s. Shortly after the introduction of ADSL in the Danish market and until today, providers have been able to offer a variety of speeds – from 256 kbit/s up to 6 Mbit/s. Since the middle of 2000, the demand for ADSL connections has been strongly increasing all over the country.

Besides price competition, the competitive situation has also acted as an incentive for providers to launch marketing initiatives, thus increasing consumer awareness of this type of fast access to the internet. So far, providers have primarily concentrated their activities within urban areas, but information supplied by the providers indicates that they are all planning to achieve nearly nation-wide coverage within the next few years.

The increasing demand for ADSL connections is being met currently by upgrading telephone exchanges with ADSL equipment. By July, 2002, 75% of all fixed-network subscribers in Denmark got access to an ADSL subscription at 2 Mbit/s.

Future Prospects/Opportunities
There are good opportunities for U.S. companies in the growing broadband market since more and more of the 275 Danish municipalities are investing in their own fiber-optic networks, which is rapidly increasing the country's broadband capacity. Denmark also adopted wireless technologies as a supplement to the traditional broadband solutions. In the coming years, there will also be opportunities for U.S. telecom service operators and content providers for the 3G mobile net.

The Danish population is ready and willing to test new products and the Danish Government is also keen on developing the Danish society into one of the most advanced countries in the world.

Another key reason to enter the Danish market is that the competitive environment has nurtured many strong small and medium sized players. This leads to obvious partnering opportunities for US companies that want to engage in strategic joint ventures and extract know-how and advanced market information.

Feel free to contact CS Copenhagen to find out more about the many opportunities in Denmark.

Hardware

Market Players
HP/Compaq, Siemens, IBM, Dell, Terma, Canon, Fujitsu Siemens, SDC Dan Disc, Zitech, Sun Microsystems

Government Role (optional - i.e. encryption)
The Danish government is devoted to the concept of pervasive computing. This concept covers not only the ubiquitous presence of computing devices in society, but the way in which it adds "intelligence" to many of the traditional products, services and business processes. It is predicted that precisely this dimension holds huge commercial potential for Danish business and industry.

Technology In Use
All major technologies are in use in Denmark

Market Driving Forces (government, banking, SME, personal, or industry sector)
Denmark has the world's most sophisticated public sector in terms of ICT usage. There are huge public investments in IT, extensive funding of research institutions and new incubator environments. There is strong support and commitment from the Public Sector in promoting the ICT Sector in Denmark, thus providing opportunities for public/private initiatives and projects.

Future Prospects/Opportunities
Denmark is at the forefront of the Digital Economy and ICT plays a major role, both in the public and private sector. The players in the ICT field are actively looking for new technologies and applications and ways to improve and speed up processes. The use of hardware in Danish businesses is high; 95% of Danish businesses with at least 5 employees use PC's

Software

Market Players
Microsoft Business Solutions, EDB Gruppen, SAP, SimCorp, Oracle, SAS Institute, NCR Danmark, Siebel Systems, Systematic, Baan

Government Role (optional - i.e. encryption)
The Danish public sector enjoys the reputation of being among the most advanced, even on a global scale, in terms of IT usage and infrastructure. The public sector has implemented many initiatives; development of digital signature, electronic procedures and casework in all county council offices, electronic patient journals in the health sector and establishments of a broadband network between public institutions. There is a strong financial commitment from the public sector in the development and implementation of ICT in Denmark.

Technology In Use
Denmark has a strong position in software development and all major technologies are in use. Leading international software developers such as Microsoft, Oracle and IBM have tapped into the Danish expertise by establishing development facilities in Denmark.

Market Driving Forces (government, banking, CAD, SME, or personal, industry sector)
Denmark is at the forefront of the Digital Economy and ICT plays a major role, both in the public and private sector. The players in the ICT field are actively looking for new technologies and applications and ways to improve and speed up processes. Outsourcing of IT functions and software development by the public and private sector is a future growth area in Denmark.

Future Prospects/Opportunities
The Danish market is very competitive and all major brands are present. More companies are outsourcing and security is a hot issue. New innovative products with a proven track record will – with the right local partners - have good opportunities in Denmark.

Contact Information

Bjarke Castberg Frederiksen
Senior Commercial Specialist
U.S. Embassy - FCS
Dag Hammarskjölds Allé 24
DK-2100 Copenhagen - Denmark.
Tel.:+45-35 55 31 44 (ext. 202)
Cell:+45-20 23 31 44
Fax:+45-35 42 01 75
Bjarke.Frederiksen@mail.doc.gov

Estonia

Telecom

Market Players
The Estonian telecommunications industry is led by Eesti Telekom, which comprises both the fixed line and mobile business. In 2001 new service providers entered the market for fixed telephone services. Of the largest operators, Tele2 and Uninet have begun offering international and domestic calls. Three operators dominate Estonian mobile communications market: EMT (1991, belongs to Eesti Telekom); Radiolinja Eesti (1994, belongs to Elisa Communications) and Tele2 (owner Tele2 AB).

The rapid development of the Estonian telecom market has placed it in the same league with developed EU countries. This growth has been supported by several foreign players such as Telia AB, Sonera, Metromedia Inc, KPNQwest, Finnet Group, NetCom AB and others investing into the market.

Government Role
The telecommunications sector has been completely liberalized since January 2001.
The main bodies in charge of the regulatory issues in the field of telecommunications are as follows:
Ministry of Transport and Communications (http://www.tsm.ee) implements telecommunications policy, the development of the telecommunications sector, and the establishment of relevant supervision;
Estonian National Communications Board (http://www.sa.ee/sa/) deals with frequency management, standards and type approval of radio communications equipment;
National Competition Board (http://www.konkurentsiamet.ee) protects economic competition by developing fair business practices and carrying out surveillance.

Infrastructure and technology
Significant investments have been made into the telecommunications infrastructure. Fiber optic cables cover the whole country, direct undersea connections to Sweden and Finland and links to the neighboring Russia and Latvia guarantee first-class international communications. Another priority is the construction of an all-Estonian trunk network that would make possible the building of digital exchanges and sub-exchanges (concentrators) all over the country. A trunk network covering the entire country will create favorable conditions for the development of other networks and services (mobile telephony, data communications, cable TV, paging), and other telecommunications operators have been quick to use these advantages.

Wireless communications
Wi-Fi networks are mainly built for access to the Internet. Some telecommunication operators have created a service that combines WLAN (Wi-Fi) and GPRS service. In some commercial Wi-Fi areas it is possible to pay for the service using SMS. This service

includes VPN software and secure connection. Some schools and universities have built Wi-Fi networks to offer interactive education.

Also, some innovative companies have built their indoor networks using Wi-Fi technology to get rid of cables. At the moment (May 19, 2003) in Estonia (47000 sq. Km. and 1.5 million inhabitants) there are 114 Wi-Fi covered areas.

Broadband
International analysts consider Estonia to be the leader in Eastern Europe for broadband SL access. Almost 7 % of all fixed lines have ADSL.

Presently the main fixed telephone line provider Elion AS has over 35,000 DSL lines, more than 5,000 of which are ADSL broadband Internet self-installation kits. During the year, the ADSL coverage area has grown by one third to cover 200 populated locations all over Estonia.

In April 2003, Eesti Telekom increased its international Internet broadband capacity. It upgraded its Internet connectivity (at Pennant Point in Canada) to 155 Mbps, in partnership with Teleglobe (an international network service provider). The total international capacity of Eesti Telekom increased to more than 1 Gbps. In recent years the number of fixed phone lines has decreased, as many consumers switched from fixed phones to mobile phones.

Future Prospects/Opportunities
Estonian mobile communication companies have opened talks on the construction of a joint UMTS 3G network, construction of witch would not start before a couple of years.
The Estonian Communications Board has issued UMTS (Universal Mobile Telecommunication System) networking licenses to EMT, Radiolinja Eesti and Tele2 Eesti AS. Estonia is going to issue the fourth UMTS license, which will be put up for sale at public auction with a starting price of EUR 4.5 m. The board has to announce the auction by Nov. 1 at the latest. The bidding deadline will probably fall into March 2004.
As a small country with a well-educated population that is willing to adopt new technologies very quickly, Estonia represents an excellent test market for new technologies. The availability of modern infrastructure and low-price services is an advantage.

Hardware

Market Players
The biggest wholesalers of the hardware are GNT Estonia , Tech Data Estonia , Ordi and Microlink, representing all major world hardware producers. Estonia also has a local computer assembly industry.
In 2002 the size of the Estonian IT market was about 172 million USD from which hardware was about 56%, software 20% and IT services 24%.

Government Role
The Estonian government to solve the main IT problems common for several state organizations and to arrange the work of the state's information systems established the Estonian Informatics Centre (EIC). EIC is an implementing body in general coordination of state information policy and public sector IT development.
Main areas of work: development of state registers and computer networks, arranging of data communication in public administration, IT standardization activities, solving the compatibility problems of IT systems in different state offices, elaboration of legal aspects of informatics, etc.

Technology in Use
Most of the hardware is imported from Finland, China, Japan, Sweden and USA. Banking sector is one of the driving forces on the market and since the IT divisions of banks have no major problems in financing, they can purchase state-of –the art hardware. Also government is supporting buying the latest equipment; IT-budget has been many years around 1% of the state budget. Most of the technology in use is more advances then in many EU countries.
Estonia is the most advanced Baltic country in innovative mobile technologies.

Market Driving Forces
Banking, government and telecommunications are the driving forces of the IT industry.
Government information policy priorities for are as follows:
development of services for citizens, business sector and public administration, especially the elaboration of ID-card applications;
development of the system and infrastructure of state registers, including the development of systems that ensure the maintenance of databases and the introduction of the data exchange layer (project "X-Road") of information systems;
better provision of schools with computers to achieve the ultimate goal – one computer per 20 students;

Internet banking services have experienced rapid growth. As of the end of 2003 almost 60% of the population were Internet bank customers in Estonia. Internet banking has become a common channel through which a citizen performs cash transfers, pays taxes, pays for services, communicates with the Tax Board, etc.

Future Prospects/Opportunities
Main opportunities are in the area of system developing, digital signature implementation, unified state databases, ID cards, broadband services (ADSL, cable connections).

In 2003 the main increase in sales was in the area of digital cameras (and parts), laptops, LCD monitors, multimedia and DVD equipment and color printers.

As a small country with a well-educated population that is willing to adopt new technologies very quickly, Estonia represents an excellent test market for new technologies. The availability of modern infrastructure and low-price services is an advantage.

Software

Market Players
The biggest world software producers are all represented in Estonia. In 2002 the size of the Estonian IT market was about 172 million USD from which hardware was about 56%, software 20% and IT services 24%. Estonia has reduced the piracy rate by 33 points between 1996 and 2002 and it's now around 53%.

Government Role
The Estonian government to solve the main IT problems common for several state organizations and to arrange the work of the state's information systems established the Estonian Informatics Centre (EIC). EIC is an implementing body in general coordination of state information policy and public sector IT development.

Main areas of work:
development of state registers and computer networks, arranging of data communication in public administration, IT standardization activities, solving the compatibility problems of IT systems in different state offices, elaboration of legal aspects of informatics, etc.

Technology in Use
Most of the software and hardware is imported from Finland, China, Japan, Sweden and USA. Two largest software companies in Estonia are the IT divisions of Estonia's two largest banks, Hansabank and Estonian Union Bank, making banking sector one of the driving forces on the market. Since the IT divisions of banks have no major problems in financing, they can purchase state-of –the art hardware and that means that these divisions can support programming novelties.
Also government is supporting buying the latest equipment; IT-budget has been many years around 1% of the state budget. Most of the technology in use is more advances then in many EU countries.
Estonia is the most advanced Baltic country in innovative mobile technologies and has many local software companies specializing in e-and m-solutions.

Market Driving Forces
Banking, government and telecommunications are the driving forces of the IT industry.
Government information policy priorities for are as follows:
development of services for citizens, business sector and public administration, especially the elaboration of ID-card applications;
development of the system and infrastructure of state registers, including the development of systems that ensure the maintenance of databases and the introduction of the data exchange layer (project "X-Road") of information systems;
better provision of schools with computers to achieve the ultimate goal – one computer per 20 students;

Internet banking services have experienced rapid growth. As of the end of 2003 almost 60% of the population were Internet bank customers in Estonia. Internet banking has become a common channel through which a citizen performs cash transfers, pays taxes, pays for services, communicates with the Tax Board, etc.

Future Prospects/Opportunities
Main opportunities are in the area of system developing, digital signature implementation, unified state databases, ID cards, broadband services (ADSL, cable connections).

By the estimates of the software producers, reducing the Estonia's piracy rate by 10% would help the IT Industry grow to approximately 250 million USD by 2006.

As a small country with a well-educated population that is willing to adopt new technologies very quickly, Estonia represents an excellent test market for new applications. The availability of modern infrastructure and low-price services is an advantage.

Contact Information

Reene Sepp
Commercial Assistant
U.S. Embassy - FCS
Kentmanni 20
15099 Tallinn, Estonia
Tel: + 372-66-88-130
Fax: + 372-66-88-134
Reene.Sepp@mail.doc.gov

Finland

Telecom

Market Players
The major market players are TeliaSonera Finland, Elisa Communications and Nokia. There are also 43 private telephone companies operating under the Finnet Group.

Government Role
Finland is a fully liberal telecommunications market – no licenses needed, except for mobile networks and digital television networks. Finland's Ministry of Transport and Communications is responsible for licensing.

In order to meet the needs of Finland's fast growing ICT industry, the Finnish Government has invested substantially in training and education, especially in the field of information technology. The Ministry of Transport and Communications and Ministry of Education have both taken an active role in starting various projects related to the information highway. The Government's program explicitly promises to promote "developing a properly functioning information society." The goal in Finland has been quite clear - minimum regulation - telecommunications and the Internet are treated as any other businesses. Consumer protection laws are the same for standard transactions as for e-commerce purchases. The government is encouraging self-regulation and is following the standards set by the European Union.

Infrastructure and Technology
There are over a hundred operators carrying on registered telecommunications operations in Finland, some of which own and manage several trunk networks. There are three national and international broadband telecommunications networks: those of Sonera and Telia (merged in 2002 to form TeliaSonera Finland) and Elisa Communications. Several operators have announced plans to build national or international trunk networks. In addition, television and digital television networks may be used for data transfer. The data transfer capacity of all these national trunk networks has increased considerably the last few decades, and is expected to continue to increase at a fast pace.

Wireless communications
The Finnish market has been a leader in the mobile business, much due to Nokia, which is based in Finland. Finland has a very high penetration rate with about 90% of the population owning a mobile phone. The market is highly competitive, the major players being TeliaSonera Finland and Elisa Communications. There are also a number of smaller companies competing for the market.

Broadband
Approximately 95 percent of Finns live within five to six kilometers of high-speed fiber optic cable networks, which means that access to broadband connections are available for the majority of the population. ADSL and cable connections are gaining popularity, and competition among providers is high. In 2002, 23% of the total DSL lines in the country were sold by Competitive Local Exchange Carriers (CLECs). This is one of the highest percentages in Europe. During the first quarter of 2002, the number of DSL subscribers increased by 26% to reach 110,000. The number of cable modem subscribers increased by 16% to reach 36,000. The total number of DSL lines increased by 82.5%, from 120,000 at the end of 2nd quarter 2002 to 219,000 at end of 2002. In 2002, Finland had the ninth highest DSL penetration in the world, at 4.22 lines /100 population.

Prospects/Opportunities:
Serves as an excellent test market for development of new services. Strong competition in Finland's liberal telecommunications market has had a beneficial impact on telecommunications know-how. Along with the rapid development of technology, a wide variety of services have emerged, ranging from TV mobile chat shows, to text message based ticket sales and mobile banking services. U.S. companies have potential to offer new innovative mobile services to local telecom operators or produce content for these mobile services in cooperation with Finnish service providers. Due to high technical standards, and the liberal telecommunications market, Finland serves as an excellent test base for new technologies in the IT-field for US companies. Companies such as Hewlett-Packard, ICL and Siemens have chosen to locate their wireless Internet development in Finland, forging new strategic partnerships with Finnish companies.

Gateway to the Baltic markets and Russia (St. Petersburg)
American IT companies wishing to enter the Baltic market and Russia, especially St. Petersburg, should view Finland as a natural gateway; Finnish companies as experienced partners in any such venture.

Finland's major competencies:

Long-standing commercial relations and practical knowledge on doing business in Russia and the Baltic countries, especially Estonia
Strong technology and product adaptability
Distribution channels and contacts
Geographic proximity good for logistics

Hardware

Market Players:
The United States is Finland's leading external source of computers and peripherals. U.S. companies such as Compaq, Hewlett-Packard, IBM, Dell Computer, Microsoft, Sun Microsystems, Computer Associates, and others are active in the Finnish market. Competition in this sector comes mainly from established U.S. suppliers in the local market. There are also about 4,200 domestic computer companies dealing with computer hardware products in Finland. 3,700 companies have less than five employees and the five largest companies are responsible for 60 percent of the sector's sales volume.

Government Role:
The Ministry for Foreign Affairs controls dual use products exported through Finland to third countries. All license applications are considered on a case-by-case basis, taking into account the information exchanged within the relevant export control regime (http://formin.fi/english).

Infrastructure and Technology:
Finland's population of 5.2 million people comprises a highly sophisticated market for computer hardware and software. Finland is one of the most computerized countries in the world. This is illustrated by the fact that Finland has one of the highest numbers of computers per capita connected to the Internet. According to Statistics Finland, in 2003, about 60% of Finnish households had computers and about 50% of them had Internet access. 94% of companies employing five people or less and 98% employing ten people or more had Internet access in Finland.

Manufacture of computers and displays, which was a strongly growing sector in the middle of the 1990s, has nearly ceased in Finland. Fujitsu ICL Computers Oy (owned by British ICL) dominated domestic production of microcomputers until March 2000 when the production plant was closed and the operations were moved to ICL's factory located in Germany.

Due to the fact that Finland is such a sophisticated market and has top of the line computer hardware, there is no demand for used computer hardware. In fact, the disposal of used computers has become a problem.

Market Profile:
Reflecting the global development, the Finnish ICT hardware business is also undergoing strong transition and restructuring. The declining share of hardware sales and strong price erosion has accelerated the consolidation worldwide. This trend has already resulted in fewer large players in the Finnish hardware market. Almost all traditional hardware vendors have repositioned themselves as service vendors, and only a few companies can be considered as hardware vendors. Simultaneously**,** the Internet is increasingly reshaping the distribution of computer products.

Finland's import climate is very open and receptive to U.S. products. Since Finland is a member of the European Union, products manufactured in the EU are not subject to import duty if manufactured within the respective trading block. However, since the beginning of 1999, computer hardware imported to Finland from third countries, such as the United States has also entered Finland duty free. Regardless of the origin of production, Finland applies a value-added-tax of 22 percent to all imported goods.

During the next five years, the multi-user system market is expected to experience faster growth than PC and workstation marketplaces. Simultaneously, PCs are especially expected to meet fast-growing competition from other Internet appliances, including different types of handheld and wireless alternatives.

Consumer purchases represent a tenth of the total ICT hardware spending in Finland. At the moment, the majority of consumer purchases are PCs. During the next few years consumer spending is expected to increase in hardware and services beyond the current ICT market, e.g. new types of Internet devices, digital TV sets and related services. Demand for computers and peripherals in Russia and the Baltic countries is expected to provide distributors in Finland with excellent future market potential.

Future Prospects/Opportunities:
Products on the cutting edge of technology dominate the Finnish hardware market. Future prospects are likely to come from new innovation and advances in existing technology.

Software

Market Players:
The United States is the number one supplier of standard, non-customized application software. Competition for new-to-market computer software firms is strong and comes particularly from long established U.S. companies such as Microsoft, Novell, etc. Finland's software industry is comprised of about 4,000 companies, most of them very small that have traditionally concentrated on serving Finnish customers with application development, customizing and system integration. The export growth of the software industry has been between 40-60% in recent years and future prospects are expected to be excellent. The industry is seen as providing a new leg up for Finnish exports.

Government Role:
In order to meet the needs of the country's fast growing ICT industry, the Finnish Government has invested substantially in training and education in the field of information technology. The Finnish Ministry of Transport and Communication and the Ministry of Education have both taken an active role in starting various projects related to the "information highway."

The Ministry for Foreign Affairs controls dual use products exported through Finland to third countries. All license applications are considered on a case-by-case basis, taking into account the information exchanged within the relevant export control regime.

Regarding legislation, the Government is following the standards set by the European Union. Consumer protection laws are the same for standard transactions as for e-commerce purchases.

Market Profile:
In recent years, Finland has gained publicity through technological success stories, with Nokia leading the way. Today perhaps the most well known Finn on the global software scene is Mr. Linus Torvalds, known as the brains behind the Linux operating system.

The Finnish software industry is characterized by the following trends:
Expanding focus and application areas beyond traditional ICT software market (convergence)
Fast-growing number of new start-up software companies
Increasing role of Web-related software
Fast-growing role of embedded software
Increase in software exports
Consolidation of the software industry (mergers, acquisitions)
Increase of mobile software
More than two-thirds of Finnish software companies develop and produce traditional ICT software. The international software vendors have, however, rapidly increased their shares in the Finnish market. This trend is expected to continue in the next five years, forcing the Finnish software houses to search for other business opportunities that are based on utilization of the newest technologies.

In addition, Finnish companies have increased their activities in system and tools software segments. Examples of these kinds of products are Web-related infrastructure software packages and security software. Growth in these sectors is fueled by exports. It is estimated that there are about 1,100 companies providing their own software products in Finland. Simultaneously, at least 100 companies have products in development or in pilot phase. These estimates do not include companies only importing software, e.g. subsidiaries or distributors of international software vendors.

Finland is open and receptive to U.S. products. According to EU customs tariffs, computer software is duty free. The value-added-tax (22%) is calculated on the value of the software + delivery charges into Finland. Tailor-made computer software is free from the value-added-tax, if a company has imported the software. Computer software delivered to the end-user over the Internet (company or an individual) is not cleared by the customs and the customs does not charge duties or other taxes on it.

Future Prospects and Opportunities:
The software industry is one of Finland's most prominent industry sectors. The industry - along with software entrepreneurship – has grown rapidly since the early 1990s. The

majority of the software companies are start-ups or in early growth stages. Their business ranges from infrastructure software and data security solutions to various Internet and wireless applications, with strong technology forming the basis for innovative products. Finland has the expertise in developing computer software products and is looking for partners and investors abroad, especially from the United States.

Due to changes in recent years in Russia and the Baltic countries and Finland's longstanding experience in the region, Finland also serves as an excellent gateway to these emerging markets.

Contact Information

Tarja Kunnas
Senior Commercial Specialist
U.S. Embassy - FCS
Itainen Puistotie 14 B
FIN-00140 Helsinki
Finland
Tel: 358-9-616 25345
Fax: 358-9-616 25130
tarja.kunnas@mail.doc.gov

France

Telecom

Market Players
Third Generation (3G) and Universal Mobile Telecommunications System (UMTS), the adoption of high-speed wireless Internet service and the increase in mobile commerce (m-commerce), should fuel significant growth in the future in anticipation of a sharp increase in the demand for wireless telephone services; France is in the best position among Europe's three largest mobile markets to develop its 3G infrastructure and lead 3G- usage in Western Europe and holds some of the world's most promising business opportunities in the area of wireless telephony. The three major market players for wireless telephony are Orange (49.4%), SFR (35.3%), and Bouygues (15.3%). The major Internet providers are AOL, Club-Internet, and Wanadoo. Other operators are Worldcom, One. Tel, Tele 2 France. The two major government regulatory agencies for this market are ART (Telecommunications Regulatory Body), and ANF (French National Frequency Agency).

Government Role
In addition to the regulation of the IT and telecommunications markets by ART, the French government has lately taken steps towards raising the standards for the implementation of new technologies in France. Although some new measures have originated within the French government, most of the new regulations in the area of information technologies and telecommunications have come from European Union directives and mandates. Like other European Union Member States, France will have to transpose the new EU regulatory framework for electronic communications into national law by Summer 2003. This should, as noted by ART, strengthen regulatory harmonization among Member States. The European Commission has worked to harmonize telecommunications, Internet, and e-commerce regulations throughout the region and has undertaken a broad range of policy initiatives and programs related to the development and deployment of the Internet and e-commerce within EU.

Wireless communications
The mobile communications market requires complex regulatory actions particularly to determine the appropriate framework for convergence between fixed and mobile communications, new satellite communication systems and third-generation mobile communications (UMTS). Several technical solutions, like establishing wireless local loops or opening cable networks to telecommunications services, are already been adopted. The unbundling of France Telecom's local access network constitutes another solution likely to encourage competition on this segment. France currently holds some of the world's most exciting business opportunities in the area of wireless telephony. The mobile telephony market is growing annually at a rate of 4.3%, with 1.6 million new customers between March 31, 2002 and March 31, 2003. Continuing in this direction, the first quarter of 2003 posted a 0.8% growth rate, to bring the total to 38.9 million mobile subscribers.

Mobile telephone users recorded 138.8 million minutes of use annually, a 17.2% increase in annual volume. At the end of March 2003 there was a 64.5% penetration rate.

Broadband

Since December 2002, a new type of residential unbundled local loop ADSL offer has been available on the broadband consumer market. Alternative operators can now use their own broadband equipment from end to end allowing them to have better control over the technical and economic aspects of their ADSL offer and as a result, differentiate it from the incumbent operator's offer. There is a strong demand for fixed wireless services in France. In fact, the Organization for Economic Cooperation and Development (OECD) has predicted that fixed and wireless broadband services are one of the biggest opportunities for telecommunication companies in France. At the end of 2002, the number of individual net subscribers in France was approximately 8.5 million, over 1.7 million of whom subscribed to broadband via ADSL and cable, a 17.65 % increase over the previous 3 months. The French telecommunications regulatory agency, continues to liberalize the local loop, competitive pricing and better services should boost Internet access and demand, especially for high-speed connections.

Future Prospects/Opportunities

Firms from the United States seeking to penetrate the French market for information technology and telecommunications enjoy several distinct advantages. Primarily, this favorable position derives from the fact that European companies view U.S. firms as highly competent and competitive companies. In addition, they have a reputation in Europe for their faster time-to-market cycles and efficiency. Moreover, they have experience and credibility that comes with success in a large market like the one in Europe. Many French businesses will increase IT spending to comply with EU mandates, and this will open the door for more opportunities for American firms. Likewise, attempts by the French government to integrate information and telecommunications technologies into its operations may provide even more opportunities for U.S. firms, French distributors of U.S. products, and subsidiaries of U.S. companies in France. The EU and its fifteen member states provide one of the most open climates for U.S. direct investment in the world, with well-established traditions concerning the rule of law and private property rights, transparent regulatory systems, freedom of capital movement. The EU is expected to gradually recover from the economic slowdown and the drive will continue to increase in the demand for information technologies, particularly in France. As a result, this demand will create a favorable environment for private investment, job growth, and integration of information and telecommunications technologies. France’s information technology and telecommunications markets offer limitless opportunities for companies with innovative technologies and services.

Hardware

France has the third largest IT market in Western Europe, after Germany and the United Kingdom. France's IT market– including computer hardware, packaged software, and IT services– was valued at USD 50 billion in 2003, representing approximately 17 percent of the total western European IT market. Computer hardware, including local-area- and wide-area-networking equipment, was the next largest segment, accounting for approximately 29 percent and valued at USD 13.9 billion.

After a sharp drop in demand for computer equipment in 2002 – growth went from 6.7% in 2001 down to 0.7% in 2001 - the market has experienced a slow growth of 2% towards mid-2003. The market should be primarily pulled upward by purchases from the French public sector, about 5.9% according to experts. The French government spent over USD 5 billion in 2003, in order to further automate its processes. Its Government Action Program for an Information Society (PAGSI), launched in January 1998 included the priority of putting government services online. The French government has come a long way in achieving its goals under PAGSI. It has completely automated three of its key services: VAT declaration, customs declaration, and the filing of social contributions from employees. In addition, more and more French people fill out their income tax report through the Internet.

Internet Connections and High-Speed Connections
According to Market Research firm IDC, over 30 million people or half of the French population will be able to access the Internet by 2005. Today, France counts 8.5 million subscribers and 18.7 million people have used the Internet at least once a month. About 25.7% of the Internet subscribers – 1.5 million households - subscribe to an ADSL, cable or ISDN connection.

On the corporate level 98% of French SMEs have PCs and 80% are connected to the Internet. Over 50% have websites. 79% of the French corporations have a site in order to promote their image while 49% to so in order to provide a service through their clients and suppliers. Only 17% engage in E-commerce. Use of the Internet among corporations is divided into the following activities: E-mail (84%); Research of information (68%); Customer-Supplier relations (60%); Banking consultation (56%); Booking Reservations (55%); Bids (24%); Banking transactions (38%); Financial offers (5%).

The ADSL high-speed Internet has known a high growth in France, with 1.5 million subscribers in 2002. WiFi technologies should further this trend.

Servers
The sale of servers has dropped by 1% in units and 12% in value in 2002. The five top server manufacturers are HP (40.2%); IBM (15.4%); Dell (13.5%); Fujitsu (6.8%); Sun (6%); Misc. (18.1%). The only companies that experienced growth are Dell (+8.8% growth) and Fujitsu (+7.2%).

Personal Computers
The ten largest PC manufacturers are NEC CI, Compaq, Hewlett-Packard, Dell, IBM, Fujitsu Siemens, Toshiba, Apple, Continental Edison, and Acer. This market was estimated to be USD 1.2 billion in 2001. The French PC market has dropped by 11.6 percent from 2001 to 2002. The sale of Desktop PCs has dropped by 22 percent in volume. On the other hand, the laptop market has grown by 15 percent in volume. The server market is also doing well and grew by 5.3 percent in volume.4.8 percent in volume and 11.6 percent in value

The sale of portable PC's has exploded in 2002, growing by 25% or over 1 million units sold. Experts estimate that 1 out of three PCs sold in 2003 will be a portable. HP represents 27% of the market, followed by Toshiba 915%); Dell (13%), IBM (7%), NEC (7%), Acer (6%), Sony (5%), Apple (4%), Media (3%), and misc. (9%).

Compatibles
The toner cartridges market represents a major source of revenue and should continue growing in favor of compatibles. Over 37 million cartridges were sold in 2003 for a value of USD 1.05 billion. While compatibles represented 10.8% of this market in 2002, they are anticipated to represent 13.1% of the market in 2003.

Special printing paper
Demand has risen to 5.25 million units in 2003 for a value of USD 69 million.

Software

The Year 2002 has represented the first year of recession for computer services since the early 90's. During this period, the IT software and services market has dropped by 3%. A moderate growth of 2% has occurred in 2003, as market confidence is slowly being restored with corresponding public and private sector investments in IT.

Estimated at USD 48.2 billion the French IT market ranks third in Europe after Germany and the United Kingdom, with 17% of the overall IT market. France is also the leading European nation in IT software and services, with USD 24.1 billion in sales in 2002.

Over 6,000 French firms specialize in software services, 2,000 of which with 10 employees or more. Key activities in this market are engineering and integration (23 percent); software development and technical assistance (22 percent); packaged software (21 percent); facilities management and on-line services (20 percent); consulting services (8 percent); training services (3 percent); and third-party maintenance (3 percent).

The ten largest software services firms in France are: IBM Global Services (USD 1.77 billion); Cap Gemini Ernst & Young (USD 1.31 billion); Microsoft (USD 1.28 billion); Atos Origin (USD 1.14 billion); Accenture (USD 824 million); Altran (USD 689 million); Schlumberger Sema (USD 680 million), Bull Services (USD 639 million), IBM Software Group (USD 634 million), Hewlett Packard Services (USD 592 million).

With the exception of the Public Sector (+6%) and Utilities (+1%), most sectors have been affected by the current recession. They include Banking and Financial Services

(-5%); Insurance (-8%); Telecom & Media (-9%); Industry (-3%); Retailing and distribution (-3%); Transportation and tourism (-5%); and Services (-2%).

Activities that correspond to this drop in demand include consulting in management and in information systems (-7%); projects and integration (-6%); development and technical assistance (-12%); application software (-8%); misc. and training services

(-10%). The few that did relatively well include Technology Consulting (+1%); Third Party Maintenance of Applications - TMA (+11%), Facilities Management (+9%), and software tools (+3%).

The French package software market is valued at $7.6 billion. It is anticipated to grow at a rate of 8 percent, to reach $12.7 billion in 2006. The ten largest packaged software firms in France are: Microsoft (USD 1078 million); IBM Software Group (USD 600 million); Oracle (USD 262 million); SAP (USD 234 million); Alcatel Services (USD 155 million); Sage (USD 115 million); Computer Associates (85.6 million); Dassault Systèmes (80.3 million); CCMX (USD 68.7 million); and GFI Informatique (USD 65.5 million).

Sectors for which an increase in demand can be anticipated include Third-Party Maintenance Services (TMS); Technology Consulting Services, Customer Relationship Management (CRM), Supply Chain Management (SCM) and Enterprise Application Integration (EAI) software.

Fine opportunities are still available to American firms seeking to export to France, especially for those that provide packaged software – U.S. firms already control 70% of this market – that is sought by organizations as a cheaper alternative to customized solutions.

Contact Information:

Myrline Mikal-Goide
Trade Specialist
U.S. Embassy - FCS
2 Gabriel Avenue
75382 Paris Cedex 08, France
Tel: + 33-143-12-29-80
Fax: + 33-143-12-21-72
Myrline.Mikal-Giode@mail.doc.gov

Germany

Telecom

Market Players

Despite setbacks, things are looking up for the German telecommunications sector, although the hype of three years ago has died. There have been no more major acquisitions, like the Vodafone-Mannesmann deal, and some companies have disappeared from the market. Telecommunications service provider Mobilcom AG had to be saved from insolvency by a public loan. And the industry shed jobs for the first time last year. Liberalization of the market in public telephone service still hasn't lived up to the high expectations with which it began in 1998. The gold-rush days are over, yet the industry can still look forward to comfortable profits. Industry association Bitkom projects a 4.4% increase for the telecommunications market in 2003. The German telecommunications market is still dominated by Deutsche Telekom AG and that looks unlikely to change in the near future. However the former monopolist and proprietary network owner suffered a blow, albeit a light one, when the EU Commission ruled that the still partly state-owned Telekom was abusing its market dominance in the local telephone market by charging its competitors more for network access than it charged its own customers.

Government Role

Many opportunities for U.S. telecommunications exports and investment in Germany have resulted from liberalization of the German regulatory regime for telecommunications services over the past decade. The chief regulator, the Regulatory Authority for Telecommunications and Post (RegTP), which began operating on January 1, 1998, is modeled on the U.S. Federal Communications Commission, and aims to ensure implementation of this liberalization by serving five principal functions: licensing facilities-based telecommunications operators; frequency allocation; approving and reviewing tariffs for telecommunications services; imposing universal service obligations; and control of network access and interconnection. RegTP is a government body with nominal oversight performed by the German Federal Economics Ministry, but is independent of the telecommunications operators that it regulates, as required under the EU Telecommunications Services Directive. As elsewhere in Western Europe, the German regulatory regime is asymmetrical – meaning that its main focus is on the incumbent, as opposed to the incumbent's competitors – to offset the significant market power of the incumbent telecommunications operator, DTAG.

Infrastructure and Technology

Germany has one of the most modern telecommunications infrastructures in the world. The German government invested a huge sum in modernizing the telecommunications infrastructure of the former East Germany. For example, fiber optic cable was installed up to the curb of some two million homes in the region during the seven years following reunification in 1991.

Public telecommunications investment throughout Germany has been declining since 1995, but private investment has largely compensated for this decline, driven by competition in mobile communications, data communications, and voice communications, all due to the liberalization of these services. The German market for telecommunications services grew by 3% in 2002 to EUR 61 Billion. Cellular telephone services became the largest revenue source in the market for the first time in 2001, accounting for 37% of all sales. Increased competition among the cellular phone companies and the resulting price pressure has brought down the share in sales of cell phone services on the German telecommunications market.

Wireless communications

While European industry representatives state that Europeans do have an edge over U.S. firms in integrating mobile, Internet, and e-commerce technologies, they concede that U.S. firms still lead in many of the underlying Internet and e-commerce technologies that will be critical to newer mobile data services. This allows U.S. firms to be very competitive in this market in Europe. By the end of 2002, there were 59.2 million cellular phones in use in Germany. Market penetration rose to 71.7% slightly up from 68% in 2001. This puts Germany ahead of the United States (47.7%), and Japan (62.1%). Sales of all companies active in mobile communications in 2002 reached EUR 23.7 billion, up 2.8% from the year before. The increase in sales is mainly attributed to new data services, increasing sales for the network operators by 5.2% to EUR 18.4 billion. Service providers, on the other hand, suffered a 4.5% decrease. General Packed Radio Services (GPRS), High-Speed Circuit Switched Data (HSCSD) and I-mode, the possibility of having Internet access with a cell phone, were increasingly being used. Of the new messaging services, MMS, which includes photos being sent by cell phone, increased immensely in popularity. Three million MMS were sent last year, up 47.5% from the number in 2001. Text messages on cell phones, SMS, rose to a volume of 23.6 billion from 16 billion in 2001.

The UMTS standard in cell-phone communications, once hailed as the savior of the entire industry, has become a problem child. The GSM second-generation technology is supposed to remain in effect until 2009, running parallel to the much faster UMTS network for several years. Since the UMTS standard has so far been unable to hold up the euphoria it induced three years ago, telecommunications companies have been on the lookout for the "next new thing" to haul in cash. This was found in the wireless local-area networks (WLAN), for which the regulator distributed the frequencies last November. This technology is especially suited for hotspots: areas such as airports, business centers and universities, where large amounts of data are exchanged. A special feature of WLAN is the wireless access to Internet, particularly interesting to business customers on the go. Companies are now expanding research and development on this specific technology with which results can be obtained faster and more easily – meaning at a lower cost – than with UMTS.

Broadband

Broadband deployment is growing rapidly, and it is expected to accelerate over the next few years. Because DSL and cable modems have taken off as the initial broadband technologies in western Europe, technologies related to these platforms could provide some of the best market opportunities: DSL in the near term and cable modems in the medium term. There is a need for technologies to increase the speed and lower the cost of DSL to hasten its deployment, particularly among medium-sized and larger corporate clients as a potential alternative to leased lines.

Interactive digital TV is believed to have much potential in the region (albeit likely over a longer term horizon in Germany than other EU countries), and there is a demand for software to allow set-top boxes to offer new services, which is necessary to drive future growth. The EU, eager to hasten the deployment of broadband Internet access throughout the region, announced its shift from focusing on DSL and 3G to a new emphasis on stimulating competition among all possible types of broadband platforms, including satellites, 3G and other mobile standards, fiber optics, fixed wireless, DSL, and cable modems, to achieve this goal as rapidly as possible. Thus, opportunities abound for U.S. vendors of any and all broadband technology platforms that can help operators and European governments meet these EU demands. The broadband system of data transfer, digital subscriber line (DSL), has been increasingly penetrated by competitors of DTAG. Their share in the market of a total of 195,000 DSL connections in 2002 increased from 3% to 6% - a share still regarded as too low by Telekom competitors who have complained that Telekom was able to amass this market monopoly by offering customers the setup technology at a dumping price. Cable network operators own 1.5% of all DSL connections.

The regulator estimates the number of active Internet users was 35 million of those persons of 14 and older, an equivalent of 50% of this age group. Not only was the number of Internet users up; the hours spent online also increased in 2002. Prices for Internet connection have continued to drop. They were down by 29% from 2001, and are now 81% lower than in February 1999, the regulator reported.

Future Prospects/Opportunities

The three main drivers of telecommunications growth in Western Europe, especially in Germany, are value-added services, broadband, and mobile communications. Technologies and services that address these market segments are considered to be the best prospects for U.S. SMEs. Although incumbent telecommunications operators continue to dominate the German telecommunications sectors, and thus are the largest customers for telecommunications technologies in those countries, targeting their competitors is likely the best choice for U.S. SMEs. To gain market share, competing operators need new and different equipment and technologies from what DTAG offers. In addition, DTAG has longstanding, established relationships with existing suppliers or systems integrators, and a preference to continue to work with them. This fact can make it difficult for new (particularly small) vendors to establish a foothold and sell to the incumbents, according to local market experts.

Media companies and telecommunications operators need attractive, practical, and robust applications and content to drive broadband adoption across Europe, particularly among consumers. There currently is no "killer application" to convince the majority of European consumers they need broadband, let alone to pay for broadband content. Applications in the areas of e-work, e-education, e-government, e-health, and e-entertainment could help provide such demand.

Hardware

In 2002 the value of the German market for PC's was valued at USD 9.570 billion with the U.S's share placed at 17.3%. In 2003 the market was valued at USD 9.043, a drop of 5.5% over 2002, the U.S's share of the market remained unchanged at around 17.5%.

Continuing a 10-year record as the economic laggard of Europe, 2003 saw the German economy enter its third year of stagnation. The mild technical recession of early 2002 was repeated in 2003. German GDP growth settled at 0.2% in 2002 down from 0.6% in 2001, while in 2003 growth was flat. Currently, German investment and consumer demand is low and exports are diminishing as the Euro has appreciated against the dollar. Despite the gloom, the latest economic surveys taken in December 2003 see some light at the end of the tunnel and predict 1.6% growth for 2004.

Major players
The German hardware market is the largest in Europe and can be seen as a gateway to the emerging markets in Eastern Europe. In 2003 major players in the German PC market were: Fujitsu/Siemens, HP, Medion AG, Dell and Acer. Some major distributors are: Actebis, Macrotron, Maxdata, Ingram Micro,Tech Data, Vobis and Raab Karcher. Though figures are not available, very large numbers of PC's are sold via the Internet by a huge variety of very small to large companies.

Computer hardware market
In 2002, total German sales of PC's declined 2.8% to 6.869 million units. Sales in 2003 grew 5% to 7.213 million units. However, all growth was attributable entirely to notebook sales, up from 1.772 million in 2002 to 2.298 million in 2003, a whopping 29.7% increase. Desktop sales fell from 5.097 million units in 2002 to 4.915 million units in 2003, a decline of 3.6%.

Despite the rise in 2003 PC unit sales, price cuts resulted in a 5.5% reduction in their market value to USD 9.043 billion over USD 9.570 billion in 2002. This trend is expected to continue in 2004.

Notwithstanding the continuous decline in market value for desktop PC's, Germany remains Europe's largest market for these products with 4.9 million units sold in 2003, a 3.6% decrease over 2002. In contrast notebooks are experiencing a rapidly increasing popularity in Germany with unit sales in 2003 of 2.3 million.

The majority of the notebooks growth is consumer generated, accounting for 45% of all sales in 2003. 2004 unit sales are expected to rise 21.4% to 2.79 million. Significant price declines are also affecting the notebook revenues and despite the significant increase in unit sales for 2003, growth in market value was only 8.1% totaling USD 3.153 billion against USD 2.918 billion in 2002.

Future prospects and opportunities
America is still seen as the producer of leading edge technology and its products are very well received in the German market place. Currently, major opportunities exist in "mobile technology" centered on the laptop and wireless LAN. Additionally, new and innovative memory and storage products present opportunities for U.S. companies

Market access/barriers
There are no customs duties on most IT-equipment imported to Germany. Only DVD writers and CD writers are liable to a duty of 14% and 2% respectively. These duties are to be applied to the billed amount including national shipping costs. Additionally, all IT products carry a 16% value added tax.

A future burden for American IT-exporters to Germany is contained in legislation due to come into effect on August 13, 2005. This law, based on the European Union directive 2002/96/EC, requires manufacturers to take back electrical and electronic waste from distributors, resellers and end users. The German Ministry for Environmental Affairs (BMU) is currently working on a draft law to pass to parliament for enactment.

Germany imposes copyright levies on certain digital devices and media. Levies are paid by the German importer or manufacturer to the ZPÜ (Zentralstelle für private Überspielungsrechte) – the German Central Organization for Private Copyrights.

Software

Market Players
The German software market is the largest in Europe and is also seen as a gateway to the emerging markets in Eastern Europe. In 2002, the major players in the German software market were: SAP AG; Microsoft Deutschland; Software AG; Oracle Deutschland GmbH; Mensch und Maschine Software AG; CA Computer Associates GmbH; SAS Institute; FJA AG; Ixos Software AG; BMC Software; Novell GmbH; Nemetschek AG; and Brain Automotive GmbH. These companies achieved more than 60 percent of their sales in the standard software area.

In 2002, the 25 largest German standard software companies accounted for about EUR 5 billion in sales within Germany and had export revenues of EUR 6.6 billion. It is estimated that the top ten suppliers hold approximately 30 percent of the German market, mainly with sales of standard software. Medium-sized vendors account for more than 60 percent of total sales of standard software.

Analysts estimate that approximately 80 percent of software products in Germany is imported, mainly from the United States (the majority of the large U.S. software developers have subsidiaries in Germany).

Government Role

Information and communications technology (ICT) is a key industry in Germany, one that also offers a large potential for employment. Despite the large number of insolvencies over the last two years that freed up personnel, there is still a lack of highly skilled personnel, and this has moved the German government to act quickly to resolve this situation on a short-term basis, implementing the "green card" system.

As e-commerce activities and data exchange increase, the government also plays an important role regarding the secure transfer of data (e.g., digital signature, which now to the greatest possible extent is being accepted at the same level as a handwritten signature) and other IT security issues. This is being handled by the Federal Office for IT Security. The German government is also taking on responsibility regarding the protection and warning against virus attacks, and has founded a special Computer Emergency Response Team CERT and M-CERT (for medium sized firms) for this purpose. E-government is also playing an increasingly important role in Germany and the federal government is investing substantially in making their 400 services available on-line: the eGovernment-Initiative BundOnline 2005. (To date, 224 of those have already been installed).

Another big issue is the assignation of software patents in Germany, which is still under discussion. In order to keep the German software market competitive, the government is presently not too interested in changing the software patent law to be similar to that in the United States. This is being criticized by major German ICT associations, who would like to change this situation. They are of the opinion that software developers are facing high research and development costs and should be able to protect their intellectual property.

Infrastructure and Technology

The German software and IT services market is the largest one in Europe and ranks third in the world, after the United States and Japan. In 2002, there was an overall EUR 41 billion market in Germany: $15 billion for software and $26 billion for IT services (even though the line between software and services is hard to draw.) The share of the system software market of EUR 7.7 billion was approximately equal to the one for application software, which amounted to EUR 7.4 billion.

For the first time in years, the German software market stagnated, and the double-digit growth rates that the industry had become accustomed to during the halcyon years of IT-hype, could no longer be achieved. This decline is attributed to a global economic weakness, which had a negative impact on software spending. 2003 was another difficult year for the German software industry, but industry insiders estimate that the market will pick up again in 2004, with anticipated growth of about 2 to 3 percent.

Future Prospects and Opportunities

Software market growth in Germany is attributable to the following factors: higher demand for security software, substantial investments in Integrated Enterprise Applications to streamline back- and front office operations, increasing investments in e-business applications and other enterprise applications, such as Customer Relationship Management (CRM) technologies, Supply Chain Management (SCM), and information and data management software. Software investments are primarily expected from SME's, which dominate the German market, and from the banking and insurance side, who require a speedy replacement of their outdated equipment. However, the weak economy, which led companies to re-negotiate the price of their software licenses, and the increasing complexity surrounding software projects are acting as major inhibitors to a faster growth trend, as outlined above. Driving forces for IT investment will remain a quick ROI (return on investment), optimization of business processes and cost reduction.

Market Access

U.S. products are very well accepted in Germany, since the United States is widely seen as leading the world IT industry in innovation and quality. U.S. products and services consequently enjoy an excellent reputation. The import climate for computer software and services is excellent and there are no trade restrictions. U.S. exporters of security software should be aware of the possible requirement to obtain a special export license from the U.S. Department of Commerce's Bureau of Industry and Security. In order to sell their products and services in Germany, U.S. firms must adhere to certain standards (e.g., DIN, TUEV-IT, etc.) When interested in penetrating the German market, U.S. companies should carefully select a competent local agent, distributor or systems integrator or should consider a joint venture or other strategic alliance with a local IT service company. The majority of German firms do call for local support. Important keys to success in Germany are reliability, flexibility, innovation and willingness to support marketing efforts by the German representative.

Contact Information:

Doris Groot
Commercial Specialist
U.S. Commercial Service
American Consulate General
Koeniginstrasse 5
80539 Munich, Germany
Tel: (49) 89 – 2888-749
Fax: (49) 89 – 285261
Email: Doris.Groot@mail.doc.gov

Volker Wirsdorf
Senior Commercial Specialist
U.S. Commercial Service – American Consulate General
60323 Frankfurt, Germany
Tel: (49) 69 - 9562040
Fax: (49) 69 – 95620424
Email: volker.wirsdorf@mail.doc.gov

Greece

Telecom

Market Players
There is a strong PC assembly industry in Greece accounting for about 60% of the Greek hardware market. Three local firms dominate the market: QUEST GROUP, POULIADES & ASSOCIATES and ALTEC GROUP. All the above import components from the U.S. and Far East. There is no local production of computer networking technology equipment. According to trade sources, there is a very limited presence of French, German, and Israeli companies, despite their geographic proximity and their knowledge of the Greek market. Some Far East and Japanese manufacturers have captured a limited market share.

U.S. IT technology products account for almost 55% of the import market. Principal equipment imported from the U.S. includes: PCs, servers, printers, modems, multiplexing equipment and related software.

Government Role
Many of the largest IT consumers in the Greek market are state-owned companies. The EU provides almost 70% of the funding for Greek Government IT projects. The key factor in winning a government tender in the IT sector appears to be price.

Infrastructure and Technology
A public sector opportunity in the Greek IT market is the forthcoming 2004 Athens Olympic Games and related IT infrastructure projects. Moreover, as Greece is a service-oriented market, IT applications in the areas of tourism and transportation are also in growing demand.

Major projects include the creation of a planned National Land Registry by the Ministry of the Environment, Planning and Public Works. This is an ambitious effort to create a complex body of information in electronic format. The project is expected to be completed by 2010. Additionally, the prefectures of Greece are to establish a department to provide support to schools on matters of information science and technology, as well as training programs for teachers, in topics such as office automation, multimedia, and the Internet.

Wireless Communication
According to industry analysts, the next big trend in the Greek IT market will be a rush to install wireless networks. Among products already in demand are wireless trunk equipment, digital broadcasting systems, DECT, and other alternative network solutions that allow operators to create a network without cable. Industry experts predict that NETSCAPE, NetCom, Orckit, Digi-Cash and FTP networking software will have excellent sales prospects in Greece.

Broadband
Domestic broadband access providers include OTE, EUROPROM, INFO-QUEST and all operate in the 3.5 GHz frequency band.

Future Prospects/Opportunities
Greece is one of the most challenging IT markets in the EU. A steady rate of growth during the past five years represents solid potential for future sales expansion. Emphasis has primarily been on PC's and peripherals, but also on services, software and the Internet as it gradually develops in Greece. Obviously, the IT market in Greece has not yet reached a mature phase, and is significantly underdeveloped compared to the rest of the EU. This leaves considerable room for expansion and creates numerous business opportunities to U.S. firms. Additionally, Greece offers the availability of well-trained engineers and professionals with a considerably high level of expertise, along with funds from the EU to encourage IT projects and expansion.

Greece also offers important opportunities for the development of R&D facilities in information and communications technologies and in microelectronics.

However, the most significant opportunities for U.S. service providers and equipment suppliers in the near term remain with products and services related to computer systems and peripherals.

Hardware

market players
There is a strong personal computer assembly market in Greece accounting for about 60% of the Greek hardware market. The four local firms dominating the market are: Quest group, Pouliades & Associates, INTRACOM and the Altec Group. The majority of hardware components in Greece are imported from the U.S. and Asia. There is no local production of computer networking equipment in Greece. There is a limited presence of French, German, and Israeli and to a smaller extent some Japanese and Far East manufacturers.
U.S. IT technology products account for 55-60% of the import market. The primary equipment imported from the US includes personal computers, servers, printers, modems, multiplexing equipment and related software and is shipped directly from the US or their European subsidiaries.

government role
Many of the largest IT consumers in the Greek market are state owned companies and organizations. In the period 2003-2008 it is expected that approximately $2 billion will be spent on IT projects. The EU will provide almost 70% of the funding for these Greek government IT projects.

Athens 2004 Olympic games
Due to the 2004 Olympic Games, both public and private sector companies have invested significantly on IT hardware equipment. In addition, Greece's upgrade of its tourism infrastructure and associated technologies in the areas of telecommunications and transport has resulted in numerous opportunities for IT equipment providers.

Prospects for the future
Compared to other EU nations, the Greek IT market is considered underdeveloped. As such the total market for IT telecom and equipment is expected to reach $ 3.75 billion in 2004. In particular, the sectors of Telecommunications, Banking, Insurance, and Tourism are expected to have the most promising prospects for US firms..

Statistical data
*In Billions of U.S. $ *(the statistics below are unofficial estimates based upon the vies of industry contacts and observers)*

TMS=TLP+TIM-TEX	**2001**	**2002**	**2003**	**2004**
Total Market Size	3.622	3.421	3.653	3.750
Total Local Production	1.207	1.147	1.227	1.300
Total Exports	201	211	232	250
Total Imports	2.616	2.485	2.658	2.700
Imports from the U.S.	1.700	1.615	1.728	1.850

Software

General Environment
Software sales showed a considerable increase in the year 2003. They reached approximately 350 million euro. This has resulted in a strengthening of the international software companies' position in the Greek market.

Market Players
The Greek software market is large and growing therefore competition is high. Almost 55% of the total software distributed in Greece is produced locally. The major companies are: Delta-Singular, DIS-Computer Logic, UNISOFT, INTRASOFT, BYTE, MLS Pliroforiki.

Government role
Many of the largest IT consumers in the Greek market are state owned companies and organizations. During the last decade there has been a huge investment by the government in the IT upgrade of state services (Public Insurance, IRS, Health, Education, Army, etc.). It is expected that continued investment in streamlining and upgrading Greek government ministries will continue.

Prospects for the future
Compared to the EU, the Greek IT market is considered underdeveloped. As such US firms can expect positive results from the Greek market for many years to come. In particular Internet penetration in Greece is among the lowest in the EU. As Internet use grows, however, opportunities for the US web development software and associated services is expected to grow. The sectors of Telecommunications, Banking and Insurance, and Tourism also have very promising prospects.

Contact information

Mrs. Debbie Priamou
Senior Commercial Advisor
U.S. Embassy - FCS
Vassilisis Sophias 91
10160 Athens, Greece
Tel: + 30-210-721-2307 (2326)
Fax: + 30-210-721-8660
Debbie.Priamou@mail.doc.gov

Hungary

Telecom

Market Players

The Hungarian Telecommunications Company (MATAV) is the dominant telecommunications service provider in Hungary. It had a monopoly on long distance and international public switched services until the end of 2001. The company was privatized in the mid 1990s and is currently majority-owned by Deutsche Telekom (59.6 percent) with the remaining shares trading on the Budapest and the New York Stock Exchanges. It is also the major, but not exclusive, provider of local telecommunications services. Of the 54 primary network areas in Hungary, it operates directly in 36 regions and provides joint service in three others. In addition to fixed line services, MATAV is engaged in mobile telephony (its subsidiary, Westel 900 with 3.7 million subscribers is the market leader), data communications, internet service (Axelero with 173,083 subscribers), cable TV (MATAVKabel with 344,712 subscribers), and satellite communications.

As of June, 2003, MATAV operated 2.84 million lines including 2,027,696 residential lines, 264,369 business lines, 31,911 payphones and 520,948 ISDN channels. MATAV has invested USD 3.5 billion in network development and upgrades since 1994. MATAV has a 79 percent market share in fixed line services. Within its area of local coverage, the phone penetration rate reaches 37.9 percent and the digitalization rate is 87.4 percent. The remainder of the fixed line market is controlled by : Vivendi Telecom Hungary (operating nine concessions with 12 percent of the overall market), the Hungarian Telephone and Cable Corp (five concessions with about 5 percent market share), Emitel (a 100 percent MATAV subsidiary in three concession areas, 2 percent market share) and UPC-controlled Monortel (one concession and 2 percent market share). The total number of fixed lines amounted to 3.62 million at the end of June, 2003, representing a 35.82% penetration. The ratio of ISDN lines stood at 16.33 %.

The mobile telephony market is serviced now by only three players since Westel Radiotelefon, operating on 450 MHz, terminated its concession on June 30, 2003. The number of GSM subscribers reached 7.3 million at the end of June 2003 representing a mobile penetration of 72.1 %. There are three mobile service providers in Hungary: Westel Mobile Communications (with a market share of 48.07%, owned 100% by MATAV), Pannon GSM (with 37.19% market share owned by Telenor) and Vodafone (14.74% market share). All three players have 25-year concessions and operate on 900 and 1800 MHz.

Although MATAV, the LTOs and the mobile phone companies are the primary telecommunication service providers, alternative service providers have started to create a little more competition. The largest of them are: Pantel (75% owned by KPN, the Netherlands), GTS DataNet (a wholly-owned subsidiary of Russia's Group MENATEP), and Hungarian state-owned Antenna Hungaria (Hungarian Broadcasting Co) and eTel.

Government Role
The Unified Communication Act (EHT) having taken effect in December, 2001, liberalized the telecommunications market as of January 1, 2002. A new Electronic Telecommunications Act (fully in line with EU directives) is expected to take effect from January 1, 2004. The new law would create a real competitive environment by introducing number portability of the fixed lines after January 2004 and that of mobile phones from May 2004. It would also cut the fees charged for terminating calls from fixed-line to mobile networks, reforming the financing of universal access telecom services.

Wireless Communications
There is a demand for fixed wireless services on 2.4 GHz in the rural, underserved areas where no alternate means of access exists. Currently there are about 20 ISPs active in this market, the majority of them, however, are small Hungarian companies providing coverage mostly in their hometown only. The main problem the wireless ISPs face is the lack of capital for expanding beyond their initial coverage. MATAV has been offering its wireless broadband Internet service since February 2003, for hotels, conference rooms, restaurants and other high-traffic sites.

Broadband (ADSL, satellite, cable, wireless)
In Central Eastern Europe, MATAV was the first to introduce Asymmetric Digital Subscriber Line (ADSL) service in September 2000. Currently, ADSL service is available in 72 cities; coverage will increase to 108 cities by the end of 2003. The current 57,400 ADSL subscriptions are estimated to reach about 100,000 by the end of 2003. According to a December 2002 government decision, companies carrying out broadband Internet investments may receive tax breaks totaling up to 50% of investment value. MATAV has been consequently granted a USD 14 million tax break on its broadband Internet infrastructure development.

MATAV has also launched a new "Sky DSL" service offering broadband Internet connection via satellite.

Dutch-based United Pan-Europe Communications (UPC), a cable TV service provider to 680,000 households in 60 Hungarian cities, provides broadband Internet service in 13 cities, in over half a million homes.

Mobile provider Pannon GSM is in the process of building out a test network in Budapest for GPRS based EDGE high-speed data service in cooperation with NOKIA. If the test shows significant market demand for EDGE services, a commercial product could be rolled out near the end of 2003. About 30 % of the Pannon network is EDGE capable.

Hardware

Market Players
The European IT Observatory estimates that the Hungarian computer hardware market will reach EUR 736 million ($859 million) in 2004, a 10.3% growth from the previous year. According to IDC, in 2003 Hewlett-Packard remained the dominant market leader in the hardware market, leading all three segments – desktop with 16.3% market share, laptop with 24.7% and server with 47.5%. Following HP, the market leaders in the dynamically growing laptop segment were Fujitsu-Siemens (15%), IBM (10%), Toshiba (10%), Acer (10%), followed by local manufacturers Albacomp and the now defunct Portocom.

Government Role
In 2004, the Ministry of IT and Communications is expected to spend a total HUF 47.5 billion (USD 225 million) including USD 21.8 million on the so called "Public Network" program, providing 7300 broadband access points to public institutions by Q3 2005. With a budget of USD 9.5 million (HUF 2 bn) the "eHungary" program aims at setting up 2400 public Internet access points by May 1, 2004. USD 11.2 million (HUF 2.4 bn) is to be spent on the National Digital Data Storage program and the National Audiovisual Archives. E-Government development will receive USD 11.3 million (HUF 2.5 bn) funding. Hungary's National Development Plan has also allocated USD 276 million (HUF 58.2 bn) to develop e-commerce between 2004-2006.

Technology In Use
WiFi is showing great potential – IDC forecasts a 57% growth over the next five years. There are over 25 WiFi providers already operating in Hungary. Most of these are SMEs covering relatively small areas. Once their lack of financing is addressed, the sector will take off. Some larger ISPs are also jumping on the WiFi bandwagon.

Market Driving Forces
Banks, financial services and manufacturing drive the market, with a decline in the telecom sectors.

Future Prospects/Opportunities
The Association of Hungarian IT Companies expects a 12% grow for the IT sector in 2004. Computer equipment growth was 14-18%, partly resulting from Sulinet ("School Net"), a government tax-break program aimed at increasing PC penetration in households and Internet access in schools. As a result of Sulinet, households bought 40% more PCs in 2003. The program will continue in 2004. IDC estimates the PC market would grow by 14% in 2004, with laptops growing by 22%.

Internet penetration reached 13.8 % by mid 2003, showing a 50 % growth in the Internet market. There were 623,000 subscribers in September 2003, 220,000 of which were broadband users.

Long-term opportunities exist not only in broadband, but also in two other sectors. The health sector would need to develop its IT capabilities to European standards and a large number of SMEs that are ill prepared for EU accession will need to address their IT infrastructure issues.

Sources

European IT Observatory – www.eito.com
IDC Hungary – www.idchungary.hu
Association of Hungarian IT Companies – www.ivsz.hu
Hungarian Ministry of IT and Telecom – www.ihm.hu

Software

Market Players
According to IDC, the Hungarian software market grew by 12-14% in 2003. The European IT Observatory estimated that the Hungarian software market (system software and applications) would reach EUR 529 million ($617 million) by 2004, up 12.9% from the previous year. The Business Software Alliance places illegal software use in 2003 at 45%, down from 76% in 1994, but still higher than the EU average of 38%.

Leading IT service providers are HP, KFKI Group (Hungarian), IBM, Oracle, Unisys, SAP, Synergon (Hungarian) and PWC.

The largest software developers are mostly Hungarian: Graphisoft, Siemens PSE (German), Gamax, Idom 2000, IQSys, MAV Informatika , Evosoft, Montana, Volan Elektronika and Scansoft-Recognita (US).

The largest systems integrators are also mainly Hungarian: KFKI Group, Synergon, T-Systems Dataware (German), Montana, Unitis, Systrend, Minor Rendszerhaz, Humansoft and Radiant.

Government Role
The Hungarian government is determined to make Hungary a more attractive destination for outsourced IT services and company R&D. As Hungary is becoming less competitive in manufacturing, the government aims to attract knowledge-based industries that would set up regional service centers.

Market Driving Forces
E-commerce, especially m-commerce is on the increase. Parking fees, cinema tickets, online software, even airplane tickets can now be bought by using a cell phone and micropayment infrastructures are already set in place. On an enterprise software level, Enterprise Resource Management and Customer Relationship Management solutions, especially web-based, are driving the market.

Future Prospects/Opportunities
The majority of Hungarian SMEs are still unaware of basic IT security concepts, but with this issue getting ever more media attention, it is expected that SMEs will invest more into IT security infrastructure.

Sources

European IT Observatory – www.eito.com
IDC Hungary – www.idchungary.hu
Association of Hungarian IT Companies – www.ivsz.hu
Hungarian Ministry of IT and Telecom – www.ihm.hu

Contact Information
U.S. Embassy, Commercial Service
Scott Bozek, Senior Commercial Officer scott.bozek@mail.doc.gov
David Knuti, Commercial Officer david.knuti@mail.doc.gov
Andrea Imrik, Commercial Specialist andrea.imrik@mail.doc.gov
Bank Center, Granit Tower
Szabadsag ter 7.
H-1054 Budapest, Hungary
Tel: (36-1) 475 4090 or 475 4234
Fax: (36-1) 475-4676

Ireland

Telecom

The telecommunications sector in Ireland is beginning to show signs of renewed growth. Total revenues have increased by almost 2% in the first half of 2003, with the mobile sector underpinning this growth. Moreover, five new fixed line operators began operations in the past year, while U.S. interest continues to grow with the entry of VarTec Telecom and Hibernia Atlantic alongside operators such as MCI and Meteor. Market opportunities exist for leading-edge telecommunications equipment and software across all market segments.

Market Players
The telecommunications sector in Ireland has been fully liberalized since December 1998. There is competition in the fixed line segment with EsatBT, MCI, and NevadaTel all competing to take market share from Eircom. In addition, call-by-call telecommunications service providers such as U.S. company, VarTec Telecom, began to make inroads into the market. Total annual fixed line revenues are estimated at $2.2 billion with Other Authorized Operators (OAO) holding a stable 20% market share.

Ireland was one of the first five countries to adopt the new EU Communications Framework in July 2003. Since July 25, 2003, all holders of general, basic and mobile licenses are automatically authorized to provide electronic communications networks and/or services. The authorization process is that of self-notification. Listings of all notifications are available on ComReg's website. On July 24, 2003, 39 general and 36 Basic licenses were in issue in the Irish market.

Government Role
The Department of Communciations, Marine & Natural Resources (www.dcmnr.ie) oversees the the provision and development of competitive high quality and world class services in the communications, electronic and mobile commerce sectors. The DCMNR is principally focused on developing a regional broadband strategy for Ireland and ensuring Ireland's international connectivity in telecommunications.

The Commission for Communications Regulation (www.comreg.ie) is the statutory body responsible for the regulation of the electronic communications sector. It is the national regulatory authority for the sector in accordance with EU law that is subsequently transposed into Irish legislation.

Infrastructure & Technology
There are currently some 5.2 million telecom access paths in Ireland. Mobile telephony dominates with 3.17 million subscribers, fixed lines total 1.6 million and the number of ISDN access channels stands at 388,000. There are some 21,000 retail leased-line circuits and approximately 9,000 wholesale leased-line circuits.

Ireland's telecommunications infrastructure is highly digitalized and all operators have been investing in digital network infrastructure. Broadband has been the hot topic in Irish telecommunication circles in recent years as a universally accessible broadband network together with very high capacity international links for new users are perceived as essential prerequisites for Ireland to compete in the information age.

Every operator has invested in broadband infrastructure in order to meet anticipated requirements. Synchronous Digital Hierarchy (SDH) technology is increasingly being used in the Irish backbone network infrastructure as it is well suited to the administration of higher transmission rates and provision of broadband services. Public ATM switches are being installed and, together with an extensive trunk fiber network, a national broadband network is being rolled out.

Wireless Communications

Like most EU countries Ireland's wireless sector is quite mature with market penetration at 81%. The two principal operators, Vodafone and O_2 , account for over 3.0 million subscribers while the third operator, the U.S.-owned firm Meteor, has some 127,000 subscribers. GSM technology dominates the mobile sector and each operator has rolled out GPRS technology. However, only Vodafone and O_2 have plans to launch a UMTS (3G) network alongside the other authorized 3G operator, Hutchison Whampoa, who plans to launch its service in 2004. It is widely expected that Eircom will seek to re-enter the wireless market when its five-year non-compete clause, agreed in conjunction with the sale of its Eircell mobile subsidiary to Vodafone in 1999, ends in late 2003.

Broadband

At present, the Irish broadband market consists of approximately 7,350 installed DSL lines, 3,000 cable modems and 5,400 business and residential Fixed Wireless Access subscribers, of which some 500 are utilizing WLANs. Wi-Fi hotspots have been appearing throughout the country. There are also some 6,500 FRIACO (flat rate internet access call origination) customers.

The Irish Government has appointed a cross-industry Telecommunications Strategy Group (TSG) to develop a strategy report by December 2003 for the development of the broadband sector in Ireland. According to the TSG's July 2003 interim report, Ireland has a potential market of 179,000 subscribers for broadband services in the near term.

Future Prospects/Opportunities

Telecommunications operators in Ireland continually invest in their networks. The dominant market player Eircom, for example, has a 5-year, $1 billion investment program. Hutchison Whampoa are currently investing some $100 million in the construction of the 3G network, which is being undertaken by EsatBT. Local operators will only source leading-edge telecommunications equipment and software for use on their networks and administrative systems. Despite the international ownership of Ireland's operators, local network investment continues to be controlled in Ireland within Eircom, Esat BT Vodafone, and O_2.

However, some degree of centralization, most likely in terms of technology, brands, suppliers, is anticipated over time as their respective parent organizations endeavor to achieve greater economies of scale.

All radio and telecommunications terminal equipment placed on the Irish market is required to comply with the essential requirements and other relevant provisions of the Radio and Telecommunications Terminal Equipment Directive (1999/5/EC). The essential requirements include electromagnetic compatibility and low voltage requirements as well as a requirement for radio equipment to use the spectrum effectively and without causing harmful interference. The other relevant provisions to be met include marking requirements and requirements relating to the provision of information to the user. Equipment suppliers are required to notify ComReg at least four weeks before the placing on the market of such equipment.

Contact Information

Mr. Padraig O'Connor
Commercial Advisor
U.S. Embassy - FCS
42 Elgin Road, Ballsbridge
Dublin 4, Ireland
Tel: + 353-1-667-4756
Fax: + 353-1-667-4754
Padraig.O'Connor@mail.doc.gov

Israel

Telecom

The Israeli telecoms services and hardware market is currently valued at about $5 billion annually. Spurred on by an ever-increasing level of market penetration by cellular and Internet providers, the Israeli telecoms market has experienced a phenomenal growth rate of 91.8% since 1996. In 2003, high-speed Internet grew 14% and the wireless market grew 7%.

Israel has 3.5 million direct exchange lines (a 50% penetration), using a 100% digital network (belonging to Bezeq, the local carrier), there are 6.2 million mobile customers covering 90% of the population, on four networks. All four cellular operators provide countrywide coverage and modern network services. Israel's cellular market continues to grow. Text and data services are now available in SMS, WAP and IP formats, on GPRS and EDGE technologies. Internet usage continues to grow, currently reaching around 2.5 million people and all indications suggest that broadband Internet services will continue to substantially grow and increase in revenue. Between December 2002 and June 2003 alone, the number of broadband users had increased by an amazing 93%, placing Israel sixth in the world in the growth of DSL subscribers.

Bluetooth and WiFi (Wireless Fidelity) have been in use by communications companies throughout the world, with the exception of a few countries, including Israel. The frequency needed for these services, 2.4 GHz, had been used by Israel's electronic warfare systems. Recently, the Israeli government approved the use of Bluetooth and WiFi and is spending around $2.5 million in order to protect its systems and allow this new technology to enter the marketplace.

Many Israeli companies are active in developing and manufacturing telecommunications and networking equipment. Still, Israel imports over $1 billion of telecommunications equipment each year, of which $300 million is imported from the United States. In addition, over $100 million in telecom services are imported from the United States.

Telecommunication Equipment ($ millions)

	2001	2002	2003(projected)
Total Market Size	1,940	1,490	1,350
Total Local Production	4,290	2,930	2,640
Total Exports	3,733	2,545	2,290
Total Imports	1,380	1,100	1,000
Imports from the U.S.	350	282	254

Government Role
The Israeli Ministry of Communications is responsible for the implementation of telecommunications policy and regulation. Recently, the government has approved a proposal for the establishment of the National Telecommunications Authority. This new intra-governmental body will be charged with regulating both the telecoms and broadcasting sectors. It is expected that the creation of this new authority will actually reduce regulation and inefficiencies within the industry, bringing the regulatory process more in line with that of most Western countries.

Future Prospects / Opportunities
Eighty percent of Israel's telecom equipment market is served by imported equipment. As the Israeli telecoms industry continues to expand and increase in revenue and with the introduction of new technologies, the market will continue to offer many opportunities for U.S. exporters.

As the cell phone market reaches a level of saturation, the major cellular companies have been moving towards providing their customers with the latest in value-added services, such as content, news, data and the Push-To-Talk (PTT) service. Bluetooth and WiFi technologies which were only recently approved for use by the government, will grow exponentially as Israeli companies seek to provide location-based services in cafes, airports etc. Opportunities will exist for suppliers of Bluetooth and WiFi compatible devices.

In 2003, Israel's three cable TV companies; Matav, Golden Channel and Tevel, merged to create "HOT". This new company will provide telephony, data communication services and high-speed Internet. Recently HOT has been awarded a license for a national fixed-line inland telephony.
This will provide a great opportunity for U.S. suppliers of IP technology and equipment. In building an independent infrastructure for inland telephony, Hot will require end-user equipment, central switching systems, control and monitoring systems, wireless access networks and technologies such as voice over Internet protocol (VoIP) technology.

Hardware and Software

The Israeli telecoms services and hardware market is currently valued at about $5 billion annually. Spurred on by an ever-increasing level of market penetration by cellular and Internet providers, the Israeli telecoms market has experienced a phenomenal growth rate of 91.8% since 1996. In 2003, high-speed Internet grew 14% and the wireless market grew 7%.

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For more information about export opportunities please contact U.S. Commercial Specialist Sigal Mendelovich at sigal.mendelovich@mail.doc.gov
The U.S. Commercial Service in Tel Aviv, Israel, Phone: 972-3-5197491, Fax: 972-3-5107215

Trade Events & Programs
Allow us to introduce the **Access Eastern Mediterranean Program**!
The U.S. Commercial Service at the American Embassies covering **Turkey, Egypt, Israel, West Bank/Gaza, Jordan and Lebanon** are working together to help you explore sales opportunities in all six of our markets in **JUNE** thru one unique and unified program:
1. You register just once to explore sales opportunities in all six markets!
2. Each Commercial Specialist will conduct a proactive partner/customer search, tailored to your objectives, to literally hundreds of local contacts!
3. Your company and products/services are featured on our password-accessed AEM website.
4. We track all responses and send you **SIX RESULTS REPORTS**.
5. The **Participation Fee** of $1,000 includes the partner/customer search in all 6 markets!

The "**Access Eastern Mediterranean Program"** helps you sell to the region's 150 million consumers. The electronics, telecommunications, and computer software/hardware markets in these countries are estimated to be cumulatively worth $25 billion and present outstanding sales opportunities for U.S. firms.

For Market Briefs on each country, program details and online registration, see: http://www.buyusa.gov/easternmed/ict.html

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Contact Information:
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U.S. Commercial Specialist
U.S. Embassy, FCS
71 Hayarkon Street
Tel Aviv 63903, Israel
Tel: 972-3-5197491
Fax: 972-3-5107215
sigal.mendelovich@mail.doc.gov

Italy

Telecom

Italy has the third-largest market for telecommunications equipment and services in the European Union. Fixed line and mobile networks telephone services account for 38 percent and 50 percent respectively of the total services market. The remainder consists of Internet and online services, switched data/leased line services, and cable television services.

Market Players
There were around 230 licensed telecommunications operators in Italy in 2001. More than 100 operators offer public voice telephony at national level, and more than 40 operators on a regional basis. About 34 operators have a national network license and about 25 have a regional network license only.

Telecom Italia, the former state monopoly, remains Italy's dominant operator across all communication services, with fixed network telephony and data services, mobile communications (through Telecom Italia Mobile), and Internet offerings, servicing around 27 million customers.

Wind is the second-largest fixed network and the third-largest mobile communications operator in Italy. Between them, Telecom Italia and Wind hold more than 90 percent of the fixed line market and approximately 65 percent of the mobile market.

Albacom targets specialized business telecommunications, including voice and data, and has some 100,000 business users.

Tiscali Founded as a regional telecommunications operator and Internet Service Provider (ISP), Tiscali launched Italy's first free Internet subscription service. It became a pan-European ISP in 2001. In 2002, Tiscali had 7 million active users in Europe and South Africa, of which 24 percent were in Italy.

Government Role
In January 1998, the Italian government ended the monopoly of Telecom Italia and opened the telecommunications sector to unlimited competition in basic, fixed line telecommunication services and related infrastructure. To safeguard competition in the sector, the government established an independent regulatory agency for the communications, press and broadcasting sectors. In 2001, the government transferred the responsibility for issuing licenses to the Italian Ministry of Communications. The regulatory agency remains in charge of monitoring compliances with public service licensing conditions, while the Ministry of Communications is responsible for monitoring compliance with technical and administrative conditions of licenses.

While the government ended the monopoly of Telecom Italia in 1998, it retained one "golden" share of 3.5 percent in Telecom Italia. Although the government sold its residual stake in 2002, it retains the symbolic "golden" share and a seat on the board of directors in Telecom Italia, which allows it de facto veto power over certain strategic decisions.

The government has also a major, albeit indirect role, in telecommunications provider Wind. Wind is primarily owned by Enel, the national electricity conglomerate, in which the government owns 70 percent of stock.

Infrastructure and Technology
Telecommunications infrastructure is comprised of 47 percent of fixed line networks, 26 percent of mobile networks, and 21 percent of telecommunications cables.

National Infrastructure:
Fixed telephone lines: 27.303,000
Teledensity: 47 %
Analog lines: 100%
Telecom Italia operates the majority of the national fixed line infrastructure.

International Infrastructure:
Satellite networks – Italy's satellite networks are made up of 3 Intelsat earth stations for a total of 5 antennas: 3 for the Atlantic Ocean and 2 for the Indian Ocean;

Submarine networks – Italy's submarine cable network consists of 21 submarine cables and a 10,000 km. two fiber optic pair system. The network is able to carry up to half a million calls simultaneously.

Wireless Communications.
Italy had 53 million cellular telephone subscribers at the end of 2002, equal to a penetration rate of 92 percent, making Italy the second-largest mobile communications market in Western Europe. There are currently 3 Global System Mobile (GSM) network operators in Italy: Telecom Italia Mobile (TIM); Vodafone, and Wind. In October 2000, the Italian government awarded 5 third-generation (3G) mobile licenses. 3G services will eventually be offered by four operators: TIM, Vodafone, Wind and HG3 but full-fledged operations are being delayed by a number of factors, including uncertain demand for the new services and reluctance to invest in 3G infrastructure

Broadband
Broadband services are relatively new in Italy due to low personal computer and Internet penetration rates by European standards. Italy's main technology for broadband Internet access is DSL (Digital Subscriber Services), which accounts for 85 percent of broadband subscribers. The only significant competition for DSL for broadband Internet access in Italy is provided by fiber to the buildings, satellite and leased lines.

The main backbone providers include:
Telecom Italia
Nautilus/Med1 (51% owned by Telecom Italia
Wind
Tiscali
Albacom
Fastweb
Atlanet
Global Crossing
Colt

Future Prospects/Opportunities
The fastest growing telecommunications market segments in Italy are:
Business communications – there is demand for leading-edge technologies to enable operators to offer Internet access services (especially broadband), value-added Internet Protocol (IP) services, broadband transmission services, managed data network services and Voice Over the Internet Protocol (VOIP) services;

Broadband – applications in the areas of e-work, e-education, e-government, e-health and e-entertainment are needed to drive broadband adoption, particularly among consumers;

Mobile communications – there is demand for all technologies that can enable new mobile applications, including Bluetooth, voice recognition software, compression technologies and algorithms.

Italy is the world's sixth largest industrial country and Europe's fourth largest market for the Information and Communications Technology (ICT) industry. The market still suffers from long-existing structural problems and is still undersized in comparison with Germany, the UK and France.

The deterioration of the worldwide ICT situation in 2002, deeper in Italy than in all the other European countries except Germany --, strongly affected the ICT market and brought to a halt the higher-than-average growth rates registered in the past few years. This situation persisted in 2003, but it is forecast that it will slightly recover in 2004.

Hardware

The computer hardware segment suffered the most from the global economic crisis. In 2002 its growth rate registered a dramatic decrease of 13.5 % over 2001, with total sales of USD 5.1 billion. This trend continued in the first half of 2003, with sales of USD 2.9 million and a further decrease of 6.2% in value, mostly due to strong competitive downpricing factors. In terms of units sold, however, increases were registered in several market segments.

Market players
Italian production of computer hardware is mostly limited to PCs. There are 30 major Italian PC manufacturers, who represent 82 percent of local production and meet approximately 35 percent of domestic PC demand. Foreign producers cover approximately 65% of the Italian market, with the US holding the lion's share, followed by Far East producers.

Technology in use
The economic crisis deepened the digital divide between large and small Italian companies.
In 2002 most small and many medium-sized companies decided to postpone their new technological investments and strategic projects, or replacements of their installed computer hardware base.

On the other hand, larger Italian companies kept consolidating and rationalizing their existing infrastructure in order to improve productivity and obtain benefits in terms of flexibility and governance, though paying greater attention to the Return on Investment and Total Cost of Ownership. Therefore, demand continued to remain high for equipment related to the integration and interoperability between back-office and front office applications, legacy systems and new solutions, architectural platforms and integrated technologies, and business process and IT infrastructure. Compared to the first semester of 2002, in the first semester of 2003 the number of PC units sold increased 2.3 percent (with notebooks growing 22 percent, and desktops decreasing 7.3 percent); the number of PC server units sold increased 23.1 percent, the number of midrange servers sold increased 9 percent, and the mainframes segment increased 6.3 percent in terms of MIPS.

The consumer segment, after exceptional PC purchases in 2000 to connect to the internet, dramatically reduced its demand due to occupational uncertainties and reduced income worries.

Market driving forces
Industry: The industrial sector is one of the most important end-users for computer hardware products. As mentioned, large and medium-sized companies have continued to invest to maintain their competitiveness, but smaller companies, which define the Italian economy, are less likely to increase their ICT investments during the current economic downturn. Major solution vendors are repositioning themselves in order to better serve **SME's**. The Italian government is developing plans for accelerating the development of a "new economy" business culture to foster ICT acceptance among SMEs, with programs such as a USD 114 million grant for the adoption of e-commerce solutions, or a USD 30 million grant for turning to broadband access.

Banking/Insurance: The banking/financing and insurance sectors are investing heavily in the integration of information systems of acquired banks and insurance companies and in new internet solutions and e-business projects.

Applications, such as home banking and on-line financial and insurance services, are developing, and related computer and network equipment and services are in good demand. Information technology and telecommunications will continue to play a key role in supporting the strategies of banks, financial institutions, and insurance companies to improve productivity and profitability.

Public Administration: The importance of the public sector (at both the national and local government levels) is increasingly emerging, especially in terms of spending capacity. A deep modernization and reform of the Italian public administration, based on cost-effectiveness, decentralization, transparency and simplification criteria, is taking place. The need to reach higher levels of efficiency and to offer higher quality public services is playing a key role in the growth of the sector. In particular, significant developments are occurring in the fields of e-procurement, health care management and fiscal services.

Future prospects/Opportunities
The Italian IT hardware market is far from being mature and IT potential remains very high. Market analysts concur that 2003 was a transition year and forecast a slight improvement in 2004. As soon as economic conditions improve, demand is expected to be stimulated and the market to recover.

Best opportunities exist for equipment related to storage management, ICT security management (intrusion detection systems, secure networking equipment, firewall equipment) and to the integration of Web and e-commerce solutions with ERP, Supply Chain Management and Customer Relationship Management solutions.

Software

The Italian computer software market, valued at nearly $4 billion, is one of the largest in Europe. Application software accounts for approximately 60 percent of the total market, with packaged software representing 18 percent of application software. Systems software accounts for 40 percent of the total market.

Market Players
The Italian software and services market is heavily fragmented among 48,000 firms, which include manufacturers, distributors and importers. The top five largest companies hold approximately 45 percent of the business. Italy depends heavily on foreign production of software, which accounts for approximately 75 percent of the total software market. The United States is the leading foreign software supplier.

Large to medium-sized companies are Italy's primary software spenders. However, since small to medium companies make up over 90 percent of all Italian businesses, they represent a significant market as well. Companies in vertical markets, particularly in banking, professional services, manufacturing, media, and health care, will continue to invest in software applications.

Although e-commerce in Italy is still in the embryonic stage, e-commerce applications are one of the fastest growing segments, with procurement applications in the lead.

The public administration is a large investor in information technology and will continue to be an essential market for software products as the government attempts to advance Italy's information society.

Government Role

The Italian Government is committed to modernizing the country through the widespread use of new information and communication technologies. Italy's E-Gov Action Plan for the information society dates from 2000 and is composed of 5 key elements:

- Service provision: a set of high-quality services delivered with innovative methods to citizens and businesses;
- Digital identification – techniques for user identification and secure signatures;
- Access channels – innovative channels for accessing services, i.e. the Internet, call centers, mobile phones, etc.
- Service provision agencies – back office operations for service providers;
- Interoperability and cooperation – standards for interfaces between government departments.

The leading Italian government agency responsible for implementing the strategy is the Ministry for Innovation and Technologies (www.innovazione.gov.it).

Technology

Italy's hardware sector is dominated by the Personal Computer (PC) segment, which accounts for over 47 percent of the hardware market. Local PC manufacturers meet approximately 35 percent of domestic PC demand. The remainder of the domestic market for computers and peripherals is dominated by US products and, to a lesser extent, by Far East producers. All the leading US computer hardware manufacturers are represented in Italy through subsidiaries or branch offices, including Apple, Hewlett-Packard, Dell, IBM, Sun Microsystems, Unisys, and Storage Technology, etc.

Future Prospects/Opportunities

Italian firms are increasingly investing in enterprise resource planning (ERP) software, supply chain management (SCM) software, customer relationship management (CRM) software, and e-commerce applications. The Italian banking sector is focusing on delivery channels to give customers greater access to banking services. This creates opportunities for e-commerce and on-line financial transactions applications and services.

Italy is in the early phase of adopting IT security technologies. There are good market opportunities for firewall software, secure content management software, World Wide Web filtering software, and Internet access control tools and security authentication and authorization.

Other opportunities exist for:
- Office products;
- Vertical application software for financial applications such as risk management trading;
- CAD/CAE/CAM software.

Contact Information

Nicoletta Postiglione
Commercial Specialist
American Consulate General-FCS
Via Principe Amedeo 2
20121 Milan, Italy
Tel. +39/02/626885-22
Fax +39/02/6596561
Nicoletta.Postiglione@mail.doc.gov

Latvia

Telecom

Market Players
As of January 1, 2003, Latvian telecommunications market has been fully liberalized. Since then tens of companies have taken out fixed telecom operators licenses. So far, Lattelekom, a Latvian state joint venture with Tilts Communications (Denmark), company belonging to Scandinavian Telia-Sonera, dominates fixed telecommunication sector. The company is the largest operator in Latvia with a number of subscribers exceeding 700,000. Number of subscribers to Lattelekom services steadily decreases for several years in a row as people tend to switch over to mobile services.

New market players in fixed telephony are *Telekom Baltija, Telekomunikaciju Grupa* and *Latvijas Dzelzcels* (Latvian Railway).

State communications network is controlled by state owned company VITA.

There are two mobile phone operators in Latvia: Latvijas Mobilais Telefons (LMT), and Tele2 (owner Tele2 AB). LMT is the second largest telecom operator in Latvia and 49 % of it is directly owned and 23 % indirectly (through Lattelekom) owned by Telia-Sonera group.

Government Role
Since the telecommunications sector has been completely liberalized on January 2003, government plays only supervising role protecting open competition and market principles.

The Ministry of Transport (http://www.sam.gov.lv) is responsible for determining state telecommunications industry development policy, and working out the draft legislative acts regulating the industry as well as other legislative acts related to the procedure of import, designing, building, installation and operating of means of radio communications/ telecommunications end-equipment and to restrictions or prohibitions of their use.
Public Utilities Commission of Latvia (http://www.sprk.gov.lv) is responsible for carrying out the following functions:
- Setting the tariff calculation methodology,
- Approving tariffs for utilities,
- Issuing licenses and supervising implementation of the set conditions,
- Supervising compliance of utilities with requirements for quality and environmental protection, technical regulations, standards;
- Performing dispute out-of-court settlement.

The Latvia Telecommunication State Inspection (http://www.lvei.lv/intro.htm) deals with frequency management, standards and type approval of radio communications equipment.

Infrastructure and technology
During the past decade, significant investments have been made in telecommunications infrastructure in Latvia. Fiber optic cables connect Latvia with Scandinavia, Estonia and Russia providing superior-quality international communication network. Satellite link is being used as a back-up feature. Backbone of country's fixed telecommunications network and in the largest cities is fiber optic technology. 80% of the country's fixed communication has been digitized while 100% of urban residents have access to digital telecommunications. Latvian cable TV operators heavily invest in fiber optic networks building their telecommunications services.

Wireless communications
Wireless communications expand very rapidly in Latvia. May 2002 was a break-even point when a number of subscribers to mobile phones exceeded that of fixed communications. It continues to maintain rapid growth. On January 1, 2003, there were 39 mobile phone users per 100 residents in Latvia. Current system standards are GSM 900 and GSM 1800. NMT 450 and paging services are discontinued since 2002. Mobile operators offer their customers latest technologies. MMS, SMS, WAP, GPRS, HSCSD data transfer are widely used services in Latvia.

WI-FI service is offered to the general public access to internet in several locations in the largest cities of the country and has not yet gained large popularity. Some companies apply WLAN technology for internal communication within the company. It is also planned to use WI-FI elements for providing broadband internet access to remote areas of the country.

Broadband
Fixed telephone operator Lattelekom is also the main broadband access provider in Latvia. Business ISDN and Business DSL are the most popular data service communication in Latvia. In Latvia, DSL has gained its popularity a couple of years ago, thus reducing interest in ISDN. Cable TV operators are widely offering home DSL connections through their networks. The largest TV operator, Baltkom GSM plans to provide with DSL connections through its fiber optic network for more than 30, 000 customers by the end of 2003.

Most ISP Providers also offer broadband connection. Radio-link connections maintain their niche as they still are popular among customers who want to have an alternative broadband access to internet.

Future Prospects/Opportunities
On October 2002, a tender was held for the license of the third mobile operator in Latvia and the acquisition of the UMTS 3G network. The tender was unsuccessful, because there were no bidders. Government has announced its intentions to repeat the tender in a near future. In the same time, both currently active mobile operators (LMT and Tele2) obtained the UMTS (Universal Mobile Telecommunication System) operators license.
Latvia is a country with a modern infrastructure and a well-educated population that is keen on learning and adopting latest technologies as soon as possible.

This provides a very good market opportunity for introducing and selling the most advanced technologies.

Hardware

Market Players
In 2002 Latvia' s PC market was $52.73 million or 32.1 per cent of the overall Baltic market, which was made by 51192 units sold. That was an increase of 10.7% in terms of units or 10.8% increase in terms of value. Most dynamic growth was in the notebook sector- 54.1 % in comparison with 2001.

The market was dominated by HP, which significantly increased its share after its merger with Compaq. In 2002, the company sold 13,400 units for a total amount of $18.75 million and was followed by IBM, which regained its No. 2 position with 3,400 PCs sold and $6.04 million. Third position among companies was held by local Latvian company ELKO, followed by Lithuania's Sonex.

International brand names lag behind locally assembled computers whose market share was 59% of sold computers. Brand names took the lead and continue to grow - 87% of the market is taken by desktops, 10%- notebooks and x86- made less than 3 per cent in 2002.

Government Role
The Government does not play a role in regulating the market, which has been completely liberalized. Its activities are oriented towards adopting and implementing legal acts proving that Latvia is a market economy with good export controls.

Technology In Use
Taking into account market maturity and knowledge, customers prefer to have the latest technologies available. Still there is a market for wide range of computer technologies starting from the Pentium II and ending with the latest versions of processors.

Market Driving Forces
The increase for desktops is stimulated by the price drop, more active marketing strategy and increased demand by the telecommunications and finance industries. In 2002, the state sector ordered 37% more PCs as previous year, 2003 was much worse due to change of government and its priorities. Computerization of the State education system is almost finished, thus less PCs will be demanded. Also government institutions are re-thinking its strategy by choosing long-term leasing instead of buying.

Future Prospects/Opportunities
Industry experts predict that Latvia' s PC market will continue to grow at the average rate of 13% per year reaching 96,000 units by 2007 with a value of $92 million. The fastest growing group will continue to be mobile PC group like notebooks, palmtops etc. They will have a growth rate of 20% in terms of number and 17% growth in value.

Second-hand notebooks and second-hand desktops are in strong demand among households and students.

Software

Market Players
Software industry and market is well developed and organized in Latvia. All major international software companies like Microsoft, Linux, Unix, Oracle, Novell are present directly through their representative offices or through local distributors in country. Latvia is also well known for its achievements and competitiveness in a software development. Main local players in software development are DATI, Fortek, Lursoft, IT Alise and Exigen Latvia. The Microsoft Windows market share is 77% followed by Linux: 10% and Unix: 8%

Government Role
In the same time Government allows quite liberal software policy except they regulate some areas to defend customers rights and enhance the state security. Government's position is to set the rules for market players to play in but to influence the freedom of choice.

Technology In Use
Latvia's software sector is not much different from other advanced world economies with some features characteristics typical for small country. Microsoft, Oracle, Linux, Novell, Symantec are the most popular software brand names here. Unlike some other EU countries, Latvian government keeps its faith to Microsoft and does not promote open-end software.

Market Driving Forces
Latvian Government is the largest customer in the internal market. Since new government was appointed in 2002, Latvia changed its priorities and significantly decreased government procurement for the last year. Lately, commercial purchases have become more visible, led by the finance and retail sector, which are in the process of upgrading their security. The general trend is in line with the growth of the rest of the world economy.

Future Prospects/Opportunities
Economy of Latvia has reached the point when companies and government upgrades its software. There are two reasons: software used is outdated as was purchased several years ago and necessity to increase competitive ability with the rest of the EU. Therefore, experts foresee the increase in new software sales in Latvia. The software companies that will offer flexibility like open-end software will become more popular among independent companies and programmers. In the next 2-3 years the end-user will not play significant role in the software sales, but it gradually will increase.

Contact Information

Aldis Celms
Commercial Assistant
U.S. Embassy - FCS
Raina bulv. 7,
Riga LV1510, Latvia
Tel: + 371-703-62-00
Fax: + 371-781-46-84
Aldis.Celms@mail.doc.gov

The Netherlands

Telecom

Market Players
The total Netherlands telecom market amounts to an estimated USD 18 billion and consists of about 80 percent services and 20 percent equipment. Privatized since 1989, the Netherlands market for telecommunications services is still dominated by KPN Telecom, the incumbent telecommunications part of former Dutch state-owned Royal Dutch PTT (Post, Telegraph and Telephone). KPN is active in all fields of the telecom market. While fixed line voice telephony was completely liberalized on July 1, 1997, KPN still has only a limited number of competitors in this market, particularly in the consumer market and local calls segment. Competitors include Telfort and Versatel. The five mobile telephone companies operating in the Netherlands are KPN Mobile, Vodafone, and three "newcomers" Telfort, Orange and T-Mobile.

Government Role
The Netherlands offers an open, liberalized telecom market, which is accessible and welcomes new investments, both foreign and domestic. The Dutch government is committed to promoting competition in the telecom market and stimulates the use of new technologies, which strengthens the competitive position of the Netherlands in an ICT-driven economy. One such initiative is the GigaPort project. Gigaport (www.gigaport.nl) is a joint initiative of several Dutch ministries, Surfnet, Telematica Institute and the business community. The objective is to make the Netherlands the "digital gateway to Europe". GigaPort offers a state-of-the-art testing platform and infrastructure for innovative and advanced Internet applications.

In general, the Dutch government does not get involved in promoting broadband access. In urban areas, especially in the western part of the Netherlands (the "Randstad"-Amsterdam, The Hague, Rotterdam, Utrecht) where about 43 percent of the Dutch live and work, residential and business customers already have a choice of broadband options. To promote broadband access in rural areas, however, it is believed that the government should get more involved in stimulating and facilitating private initiatives, bundling knowledge and regulating the market.

Infrastructure and Technology
The telecommunications infrastructure in the Netherlands is of high quality. The types of telecom channels being used are gradually changing. The total number of fixed analog telephone connections (Public Switched Telephone Network/PSTN) is slowly decreasing. There were reportedly about 6.3 million connections in 2002, down from almost 6.6 million in 2001. Newer communications channels, e.g. ISDN, mobile communications and satellite reception, have grown substantially in recent years. Among the first in Europe, the Dutch government auctioned five new licenses for the use of IMT-2000/UMTS (Universal Mobile Telecommunications System) frequencies for third generation mobile telecommunication during the summer of 2000.

The UMTS licenses went to the five existing mobile operators. KPN alone plans to spend some 1.3 billion USD between 2003 and 2005 on the rollout of the UMTS networks in its core markets.

Cable, with more than 90 percent penetration, presents an almost saturated market. Dutch CATV networks are organized by region and primarily are hybrid HFC (Hybrid Fiber Coax) networks. The main network/backbone in the Netherlands is a fiber optic network. Coax cable is being used from the regional station to the home. Originally, the Dutch cable network was a distribution network. The upstream path was added later. At this time, most networks are asymmetrical. Although several cities in the Netherlands are currently experimenting with fiber optic networks, Fiber-to-the-Home (FTTH) is not yet being offered to Dutch consumers on a large scale.

The City of Amsterdam hosts the AMX-IX, one of the largest Internet Exchanges in Europe.

Wireless Communications

The Dutch market for mobile telephony is almost saturated. By January 1, 2003 there were almost 12 million users. There is fierce competition between the five operators. With about 40 percent market share, Nokia offers the most popular mobile phones. New trends and technologies for mobile phones with built-in Bluetooth functions, color screens, digital camera's and Multi-media Messaging Services (MMS) functionality will give a new impulse to the mature mobile telephone market.

WAP (Wireless Application Protocol) services (mobile surfing of the Internet via special WAP telephones or PDAs) were first offered in the Netherlands at the end of 1999. WAP has not become the success that the telecom service providers had originally expected. Among the cited reasons are the lack of content and the fact that the existing networks were too slow and cumbersome to be used for mobile Internet. The use of SMS to send and receive short messages by phone is particularly popular among the younger generation. All five mobile operators offer SMS. Business use of SMS is also becoming more and more popular. SMS/TV, whereby the user interacts with TV broadcasts, is becoming increasingly popular and promising as a revenue source for the operators. MMS multimedia services were first introduced by T-Mobile followed by KPN. Due to the initial absence of sufficient MMS capable phones, expectations for 2003 sales are limited to several thousand users. The number of users for this service is expected to rapidly grow in 2004.

In 2002, KPN Mobile was the first European operator to introduce i-mode (using the GPRS network). It is expected that this medium will become more popular in 2004 as more i-mode sites become available. I-mode popularity, thus far, has not quite met initial expectations.

The market for wireless networking is still small in the Netherlands with some 50 public "hotspots". Most hotspot providers currently target the Dutch business market. KPN and T-Mobile are looking at the WiFi market and setting up public hotspots. In early May,

KPN acquired a controlling interest in wireless local area network hotspot provider HubHop in the Netherlands. KPN's German subsidiary E-Plus, announced a similar type agreement in Germany. Providing the basis for the further development of wireless broadband services, these initiatives will help KPN strengthen its position in the emerging wireless networking (WLAN) market. With 35 WLAN hotspots, HubHop is the largest provider of public WLAN hotspots in the Netherlands. Another Dutch provider of wireless Internet via WiFi hotspots is Aervik Wireless, which was recently taken over by Swisscom and has ten active hotspots in the Netherlands.

Broadband

The total number of broadband connections in the Netherlands is higher than the average for European Union (EU) and OESO countries. At about 12 percent in the Netherlands, broadband access penetration is higher only in Korea, Sweden and Denmark.

Although the majority of Dutch Internet users still connect via narrow band connection, dial-up modem and analog connections via KPN, the demand for fast Internet is currently growing rapidly in the Netherlands and the deployment of broadband connectivity is increasing both in the consumer as well as in the business market. Internet access via DSL and cable is growing rapidly at the expense of ISDN and analog connections. It is estimated that there are an overall 1.45 million Dutch ADSL and cable broadband users (consumers and business) at this time. While the consumer market is growing very rapidly, demand for broadband services from the business market is expected to show even faster growth rates.

There is fierce competition between DSL and cable providers. At an estimated 900,000 customers, cable providers currently have the largest number of broadband subscribers. Cable access share is gradually expected to decrease over the next few years.

Experiments are ongoing with wireless broadband Internet access, e.g. in the city of Utrecht there are several experiments with wireless broadband (WiFi and WLAN networks). KPN sees WLAN as an important component of its broadband strategy next to its current DSL, GPRS and future UMTS networks. The total market for WLAN products is estimated at about USD 16 million for 2003 and growing to about USD 20 million by 2004.

While estimated at only a few percent market share at this time, Voice over IP (VoIP), telephone communications via the Internet/Internet Protocol (IP), is gradually becoming more popular and affordable. The total number of business users reportedly grew from less than 1 percent in 2000, to some 6 percent in 2003, or about 8000 companies. The Dutch VoIP market is estimated at about USD 4-5 million for 2003. Rapid growth is forecasted for the IP telephony market for 2004 and following years.

Future Prospects/Opportunities
Future prospects and opportunities include mobile and fixed line telephony services, switched data and leased line services, cable services, broadband services, mobile (value-added) data services, all types of Internet related communication services, VoIP services for the business market, all types of communication security products and services, fiber-optic network products and products for broadband infrastructure expansion in general, outsourcing and maintenance of infrastructure installation, entertainment applications, multimedia services and applications.

Hardware

Market Players
The total Netherlands market for hardware (computers and computer peripheral equipment) amounted to approximately USD 5.2 billion at the beginning of 2003 and grew just marginally during the remainder of the year. While some assembly takes place in the Netherlands, most hardware sold is not produced in the country. Major suppliers to the Dutch market are the well-known, large multinational U.S. hardware vendors. Suppliers from Far Eastern countries are also very prominent.

Government Role
While there are no indications the Dutch government specifically stimulates production of hardware products as such, the government stimulates the use of new and innovative technologies in government, as well as in the business and consumer sectors. The government is also active in attracting foreign hardware vendors to locate in the Netherlands and distribute products from the Netherlands throughout Europe.

Technology In Use
Technologies available and used in the Netherlands represent the newest and latest technologies available in the world, whether in desktops, servers, handhelds, laptops, printers, scanners or other peripheral equipment.

Market Driving Forces
Driven by opportunities offered by the Internet and new, often larger applications, the market for traditional hardware products is becoming an upgrade and replacement market. Government, financial services and other business segments are the main end-users. The SME sector and consumer sectors are still growing in importance.

Future Prospects/Opportunities
In the hardware segment future prospects include data storage equipment, all types of laptops/notebooks, handhelds, small/entry level servers, laser printers, color inkjet and multi functional printers, TFT and LCD screens

Software

Market Players
The software market, estimated at about USD 4.2 billion at the beginning of 2003, was the fastest growing segment within the Information Technology sector. The software market grew by about 7 percent in 2002 with further growth in 2003. The total Dutch software market reportedly consisted of about 25 percent tools, 45 percent applications software and 30 percent systems software. The Netherlands has a large number of software and services firms, ranging from very small (often serving niche markets) to very large firms. Approximately 65-70 percent of software products available in the Netherlands are imported. The United States is by far the largest supplier (e.g. Microsoft and other multinational software producers) followed by European software producers in Germany, the United Kingdom and France.

Government Role
The Dutch government stimulates research, development and innovation in the development and use of software and other technology products. It supports entrepreneurs in starting up new businesses and developing innovative high technology products. The Dutch government is also active in attracting new foreign technology investments to the Netherlands. The country functions as a technology gateway into other parts of Europe and hosts many non-Dutch (particularly American) high technology firms.

Technology In Use
Windows is the standard in the business market, although government and business are starting to use Linux as well. While UNIX is still the most commonly used operating system for servers, Linux's market share is estimated at 10-15 percent and has now started to grow in importance. The Dutch government has announced a special program to promote the use of Open Standards and Open Source Software within the government.

Market Driving Forces
The government and financial sectors traditionally have been major end-users of all types of software products. The business market, with an increasing need to streamline business processes, has also been a significant user. More recently the SME market has begun to emerge as an attractive new market for ICT suppliers, while the consumer market has also grown rapidly in recent years due to increasing use of the Internet, games and online gaming.

Future Prospects/Opportunities
All types of standard applications, Internet and Intra- and Extranet software, networking software and network security products, development tools, Windows and UNIX-based products, safety and security products, storage management software, CRM and ERP products, and game software for the consumer market are likely to offer good opportunities in the future.

Contact Information:

American Embassy
U.S. Commercial Service
Lange Voorhout 102
1014 EJ Den Haag
The Netherlands

Mr. August Maffry, Commercial Counselor
Ms. Pamela Ward, Commercial Attaché
Phone: +31-70-310 9417
Fax: +31-70-363 2985
E-mail: August.Maffry@mail.doc.gov - Pamela.Ward@mail.doc.gov
Internet: www.export.gov – www.BuyUSA.nl

American Consulate General
U.S. Commercial Service
Museumplein 19
1071 DJ Amsterdam, The Netherlands

Ms. Carlanda L. Hassoldt, Commercial Specialist
Phone: +31-20-575 5351, ext. 349
Fax: +31-20-575 5350
E-mail: Carlanda.Hassoldt@mail.doc.gov
Internet: www.export.gov – www.BuyUSA.nl

Norway

Telecom

Infrastructure and Technology
The market for telecommunications services is still strong and holds great opportunities for companies with state-of-the-art technology (who are not afraid of competition.)

Norway, like other Nordic countries, does not have debt from the well-publicized 3G auctions in the rest of Europe. Norway has the highest per capita telecommunications expenditure in the world at about USD 900. It has very high telecommunications penetration, with a rate of 65 main lines per 100 inhabitants. All main lines in Norway are digital on an ISDN standard. Moreover, Norway has the world's highest mobile telephone density - about 80 percent - and equal to that of Finland. The country has a very well established telecommunications infrastructure that supports and carries Internet access to some of the most remote parts of Europe. Norway's telecommunication services market is estimated at USD 3.5 billion annually.

Wireless Communications
Mobile communication is an important growth area in Norway. Although development of UMTS networks may not be as rapid or extensive as first thought, the system is operational in limited capacity today. In fall 2000, the Norwegian government issued four licenses for companies to build and operate the next generation of mobile UMTS networks. At this time, it appears that only two concession winners will be able to deploy their concession commitments for UMTS networks. While GSM incumbents, Telenor and Netcom, seem to be on schedule for their UMTS network development, Broadband Mobile and Tele 2 have dropped out. Because there is little or no debt in this market, this leaves a large opportunity for expansion of Virtual Mobile Operators (VMO's) trafficking on other's networks. The upside for U.S. firms addressing this market is application software for services and traffic management. Additionally, the new generation of radio software products that combine compact hardware solutions in DAC-FPGA-SW and smart antenna applications show a tremendous upswing as scalability and migration between networks has begun.

The demand for wireless data connectivity is increasing as high-speed, high-quality infrastructure equipment is expected to provide better UMTS/3G capabilities when fully marketed from 2004. Sales of wireless technology increased by about 30 percent in 2002 to USD 16 million. As the wireless market begins to offer more enhanced wireless data services, service providers will be allowed to leverage heavily from previous investments and existing networks in the future. Competent application software, along with systems and security solutions are expected to be in demand when information is transferred real time (sales orders, changes in customer bases, etc.)

Norway is a leader in Internet services to mobile terminals via Wireless Application Protocol (WAP). Telenor (Norway's largest telecom company) was the first company in the world to launch a WAP portal. Although WAP-fever cooled in 2001, there is still significant investment in this area. Presently 2.5G is operational on the GPRS protocol delivering and average 55 to 65 kbps to the handset or mobile laptop. Mobile commerce is already a reality. Motorists can already pay for parking via their cell phones. Banks are offering mobile wallets so customers can load values, e.g. USD 100, from their bank accounts on to their cell phones and pay for transactions instantly with the phone. These services are driving the demand for secure transaction processing software. Bluetooth services are also being launched. Companies are combining WAP knowledge with high speed GPRS, GSM and Bluetooth. Geo content and Geo location or positioning services are a huge opportunity for US companies. Typically those applications that are adapted in Norway rapidly become a standard in the rest of Europe because of the Nordic reputation for quality.

Broadband

The demand for broadband communications is expanding rapidly. Telenor has been developing broadband capacity through four channels: copper terrestrial network, coaxial cable, digital ground-based broadcasting network and digital satellite distribution. The terrestrial network is currently being upgraded to ADSL and does not face challenges of other European markets because the copper quality, as a rule, is very good. These channels are being sewn together into a "Hybrid Broadband Access Network." Currently about 203,000 households (10 percent penetration) have broadband access and it is expected to increase to over 300,000 within the year. It is Telenor's goal to be able to offer broadband to 85 percent of the Norwegian households within one year.

Future Prospects/Opportunities

In addition to the market opportunities in the wireless and broadband sector, there is an increasing need for data connectivity in the small business sector, which translates into LAN hardware (particularly layer-3 switches). The critical drivers of small business networking will be need to improve management of a growing number of PCs and to share access to the Internet. Wireless IP zones at airports, hotels, etc. are expected to be more frequent, providing a more efficient workday for mobile employees. Together with high speed Global System for Mobile Communications (GSM), General Packet Radio Services (GPRS) and the new generation Universal Mobile, Mobile Telecommunication System (UMTS or 3G), all components should be in place for an improved business operation.

There are opportunities to enter telecommunications services as value added service providers. Historically the safest way to enter this arena is to enter into a partnership with a local company or a network license holder. This is true for both the terrestrial and the wireless networks. There are also possibilities to provide services directly to the end-user. The customer service market, for example, is growing rapidly as e-business activities increase. Broadband wireless communication is also a promising growth area, particularly as oil and gas activities stretch northward on the Norwegian Continental Shelf. The U.S. has great experience it can transfer in such fields. Despite the fact that

Norway and the Nordic countries aspire to world leadership in telecommunications (especially in wireless), U.S. technologies and services are very highly regarded, and there are many areas where the U.S. has know-how it can transfer.

Hardware

The Market
After three long years of declining sales, the barometer of the ICT market, PC sales, indicates a positive shift in units sold in Norway (500,000/ $2bn). However, competition in the Norwegian PC market is fierce, as there is a high degree of market penetration. In a saturated market the margins are being squeezed hard, as the number of units sold may have increased, but prices have tumbled (-20%). It is the private consumer and SMB markets that are keeping the wheels turning. The major trend in the market is a convergence of technologies, with a move from stationary PC's to laptops/PDAs with wireless, broadband mobile access, as Norwegians strive to become ever more efficient and flexible. Increasingly, corporations attempt to tailor make individual technological solutions. Coupled with this is the drive towards server based technology. Aside from the advantage of the reduction in investment costs through the use of simpler machines, there is the reduction of security risks and downtime.

Market Players
Major players in the Norwegian hardware market 2003 are HP with a 30% market share, followed by Dell at 20%, Fujitsu Siemens at 14% and IBM at 5%. Toshiba are the losers this year, losing 75% of their market share to Dell and IBM.

Future Prospects/ Opportunities
There is a high degree of convergence of technologies in Norway, moving toward mobile technology and data transfer within the SME sector. Hence the surge in the sale of laptop/PDA's and related technologies. Private consumption of PC's and laptops and related products is also an area of substantial growth, with the rollout of broadband and high use of internet in Norway.

Market Access for U.S. firms
The Commercial Service Norway offers a wide range of services for U.S. companies seeking business opportunities in Norway. These services include current market information, international partner searches, individual counseling, trade missions, arranging appointments with pre-screened firms etc.

Software

The Market
The Norwegian software market had another low point in 2002, with a drop of 6.5% to $821 million. However, the feeling is that the bottom has been reached and there are definite signs of a recovery over the next two years. This is being fueled by SMB, which appear to have a robustness to economic fluctuations. This market is highly fragmented and difficult to target. Scandinavian companies have largely operated as system integrators, selling software, integrating systems and consultancy services. There is a sense that the Norwegian market is going through a consolidation and specialisation, where outsourcing is projected to grow substantially, and the software market remain squeezed.

Market Players
The software market in Norway is closely related to computer services, especially software development and custom tailored installation. Market players will include EDB Business Partner, ErgoGroup, Ementor, Visma, and Nera. Software distributors would include Santech Micro Group, Scribona, and Ravenholm
.

Future Prospects/ Opportunities
Future prospects are seen to lie within the ERP(enterprise resource planning) and SCM (supply chain management) markets as companies focus on improving margins and competitiveness, rather than cost-cutting.

Market Access for U.S. firms
The Commercial Service Norway offers a wide range of services for U.S. companies seeking business opportunities in Norway. These services include current market information, international partner searches, individual counseling, trade missions, arranging appointments with pre-screened firms etc.

Contact Information

Victoria Aresvik
Commercial Specialist
U.S. Embassy - FCS
Drammensveien 18
N-0244 Oslo, Norway
Tel: + 47-213-085-12
Fax: + 47-225-588-03
Victoria.Aresvik@mail.doc.gov

Poland

Telecom

At the end of 2002, the Polish telecommunications market was estimated at USD 9.6 billion ($1.2 billion for the equipment market, $8.02 billion - operating services, and $0.37 billion – installation services). The total market value has shown a minimal decrease. While operating services have grown by 5.5%, the equipment market and installation services have experienced a severe slow-down (a 30% and 45% decrease respectively).

With the density of 32 lines per 100 inhabitants, the Polish telecommunications infrastructure is far behind European standards. With over 15 million users, the mobile telephony has surpassed the fixed-line telephony and keeps developing at more than 30% a year. UMTS has been delayed until 2005.

Market analysts estimate that 25 percent of Poland's international voice traffic now moves over Voice over Internet Protocol (VoIP) connections.

Market Players
Telekomunikacja Polska S.A. (TPSA), the former national telecommunications operator, has been privatized with France Telecom as a strategic partner. Even though the market has been liberalized, TPSA still holds over 94% market share in the fixed-line segment of telecommunications services and owns most of the telecommunications infrastructure. TPSA is active in all segments of the telecommunications market.

Other fixed-line operators include Netia S.A., Telefonia Dialog S.A. and a group of companies owned by Elektrim Telekomunikacja. Combined, independent operators have 1.2 million subscribers.

Cellular telecommunications is the most competitive segment of voice services. There are three operators:
Polska Telefonia Cyfrowa (PTC) operating Era GSM network (owned by Elektrim Deutsche Telekom and Media One);
Polkomtel operating Plus GSM network (owned by Polish State petroleum and power companies, Vodaphone and TeleDanmark); and
Polska Telefonia Komorkowa Centertel operating Idea network (owned by TPSA and France Telekom).

Government Role
URTP, the Office of Telecommunications and Post Regulations (www.urt.gov.pl), is responsible for all market regulatory functions including licensing and registration of operators, frequency allocation, numbering allocation, and approval of radio equipment. URTP can also impose interconnection fees in case operators can't reach an agreement.

The Ministry of Infrastructure holds the responsibility for telecommunications policy, including preparation of new legislation and regulations.

The government of Poland continues to harmonize its legislation with the European Union. The amendments to the Telecommunications Law of 1990 are coming into force in October 2003 and would allow introducing secondary regulations on unbundling local loop. The CE Mark is expected to be adopted no later than May 1, 2004, the EU accession date.

Infrastructure and Technology
Most of the infrastructure is owned by TPSA. As TPSA has in the past been using its dominant position to obstruct interconnection issues with independent companies, Polkomtel and PTC have decided to build their own backbone networks. Other companies that have their own nationwide infrastructure are Tel-Energo and NOM (owned by the Power Grid Company), Telekomunikacja Kolejowa (Railway Telecommunications), and Netia.

ISDN represents only 5% of all telecommunications lines.

Wireless communications
Wireless Local Loop (WLL) is seen as a cost-effective way to provide telecommunications services, especially in remote areas of the country. URTP solicited all interested parties to apply for reserving frequencies for wireless access in fixed-line telecommunication networks. The deadline for applying was September 1, 2003. Information on the interest is expected in the near future.
Also, current mobile licenses allow cellular operators to expand into local markets with the use of WLL with existing spectrum allocations.

Broadband
There are two nationwide operators of broadband networks: Crowley Data (U.S.-owned) and British-owned Energis.

Future Prospects/Opportunities
Cellular will continue to be the fastest developing segment of telecommunications services. The VoIP technology is expected to be the future of the market's development. The market also offers very good opportunities for suppliers of WLL equipment.

Hardware

The information technology market in Poland is estimated to be a USD 3.14 billion sector. The hardware market represents about USD 1.5 billion of the IT market.

Market Players

In 2003, 1.2 million desktop computers, notebooks and servers were sold. Polish companies have a 55% market share of this segment, most of which is assembly done by small companies. Foreign suppliers dominate the notebooks and high-end computer market segments.

There are approximately 5,000 IT companies in Poland employing 28,000 people. Most companies are small – only 25 of these companies employ more than 250 people. Most well known large international IT companies have established offices in Poland.

Government Role

The Ministry of Scientific Research and Information Technology, established in 2003, was created to oversee the ICT development in the public sector. A Law on Information Technology, which is currently being prepared, is expected to make this Ministry responsible for coordination of public sector ICT projects. Ministry of Scientific Research and Information Technology has prepared a paper entitled "Strategies for Information Society Development in Poland," which outlines the directions of future public IT investments.

Poland maintains control over the trade and use of commodities listed under the Wassenaar Agreement – the Export Control Department of the Ministry of Economy, Labor and Social Policy is responsible for these controls.

A law governing the application and use of the CE Mark in Poland is expected to be adopted by May1, 2004, the E.U. accession date.

Technology In Use

In general, Poland follows world trends in applying the latest IT technologies with a delay of about 2-3 years. High security standards are maintained in large IT projects, especially in the financial, banking, telecommunications and other public sectors. Smaller projects and private users often fail to maintain the latest security solutions.

Market Driving Forces

European Union accession, foreign investments, continued privatization of major sectors of the economy (such as energy, energy distribution and mining) and increasing IT investments by SMEs are the main market driving forces.

Current public expenditures for IT development are estimated at only 2.1% of GDP and are expected to increase substantially.

Future Prospects/Opportunities
Most public IT projects remain to be implemented and it is expected that more attention will be given to them starting in the later part of 2004. Contractors are selected through tender procedures.

The expected increases in demand will likely present opportunities for suppliers of computer parts and components. Good prospects also include networking equipment and computer peripherals.

Software

The computer software market is estimated to be a USD 737 million sector and has shown only minimal growth rate in recent years. The computer services market, a USD 1.1 billion sector, continues to be very active as the fastest growing segment of the Polish IT market.

Market Players
Polish companies develop approximately 60% of the software sold in Poland. American companies hold more than 25% of the total software market. Most large international well-known software companies established offices in Poland.

As Poland has many skilled, well-educated software engineers, foreign companies often contract out some of the work to facilitate their market entry efforts. Motorola, Intel and Oracle have recently established software development centers in Poland.

U.S. companies can benefit from the High Technology Accelerator program set up by the University of Texas in Austin and the University of Lodz, under a Lockheed Martin F-16 offset program. One of the goals of the program is to facilitate joint venture activities and strategic alliances between innovative high-tech companies.

Government Role
Piracy of intellectual property remains a significant problem. Poland was placed on the USTR "Priority Watch List" due to several shortcomings in this area. The government is working on the improvement of copyright and patent enforcement. The government is also working on new regulatory solutions, which would eliminate barriers for outsourcing of IT services in the public and financial sectors.

Poland follows EU rules and makes an effort to implement all EU directives. Software licensing sales, which fall under intellectual property regulations, are subject to a 20% tax, what is withheld by the Polish buyer. Upon providing documentation confirming that the American company pays taxes in the U.S., 10% is withheld.

Technology In Use
In general, Poland follows world trends in applying the latest IT technologies with a delay of about 2-3 years. High security standards are maintained in large IT projects, especially in the financial, banking, telecommunications and public sectors. Smaller projects and private users often fall back on security solutions.

Market Driving Forces (government, banking, CAD, SME, or personal, industry sector)
The financial and banking sectors, telecommunications companies and industry are the main buyers of computer software. In view of limited IT investments in the public sector, SME have become important buyers of computer software, including ERP.

Future Prospects/Opportunities
Strong growth in computer software sales is expected thanks to greater demand of computer networking and the need for more data base management systems. Good opportunities exist for special software in networking and tools, especially security software.

Best prospects for computer services include computer educational training, consulting, hardware maintenance and services, and data processing.

Contact Information:

Maria Kowalska
Commercial Specialist
U.S. Embassy - FCS
Ul. Poznanska 2/4
00-680 Warszawa, Poland
Tel. + 48-22-625-4374
Fax + 48-22-621-6327
Maria.Kowalska@mail.doc.gov

Portugal

Telecom

Data transmission services are fully liberalized in Portugal. Mobile telephone service was privatized in 2000 and fixed line telephone service at the beginning of 2001. Portugal Telecom, the former Government telecommunications monopoly and the largest market player, became a private entity. Nevertheless, two years after the full liberalization of the Portuguese telecommunications sector, most of the new fixed operators are now out of business and Portugal Telecom controls 92 percent of the market.

New private operators blame the failure to privatize the fixed net on GOP mismanagement, especially regarding the lack of access to the local loop, the last link in the fixed telecommunications net that permits access to the final customer. Some of these operators have suggested mergers to create new companies, which could compete with Portugal Telecom in the fixed telecommunications business. Many experts feel that only one strong competitor can exist with Portugal Telecom in this small market of 10 million people.

The Portuguese mobile telephone market keeps growing. In 2002, revenues generated by the three major Portuguese operators were over 2.9 billion dollars. Profits generated so far in 2003 are over 3 billion dollars. Actual mobile phone market penetration is incredibly over 80 percent of the population (roughly 8.5 million people).

The GOP planned to launch the Universal Mobile Telecommunications System (UMTS – 3rd Generation Mobile) through four licensed operators in early 2004. Nevertheless, ANACOM, the Portuguese Federal Communications Commission, concluded that not all technical components would be ready until 2003, and recommended the system's delay. This technology and the need for a large number of antennas leads to a such high investments that the four licensed operators are presently trying to reach an agreement in order to create a shared company in order to build infrastructure and minimize fixed costs. As soon as the UMTS starts, a boom in European data traffic will occur immediately. During the first phase of the UMTS usage, it is expected to explode from an initial usage of 2 per cent of the population to 50 per cent by 2005/2006. It is also estimated that "mobile" m-commerce across Europe will expand data traffic from $290 million in 1998 to $21.4 billion in 2005.

In 2001, Portugal also inaugurated the most ambitious and innovative television project on an international level. TV Cabo, part of Portugal Telecom, and the major television operator in Portugal, partnered with Microsoft Corporation to launch digital interactive TV. This revolutionary technology, which Microsoft is piloting in Portugal, will permit home TV shopping, home banking, TV Internet navigation, and even access to one's home utilities via remote Internet.

Despite the downturn in the global telecommunications market, the telecommunications market in Portugal is expected to continue to grow. Imports constitute 73% of the total market and the U.S. real share is much higher than the 3% reported because most U.S. exports to Portugal come through other European Union countries. There are many opportunities for American companies to expand their business in this area.

Software

Portuguese demand for computer software should present positive long-term prospects with the introduction of the latest generation of micro-computers, the development of telecommunications, the interconnection of heterogeneous systems and the creation of valued-added networks.

Portuguese demand for computer software, USD $482 million in 1999, should continue to experience a high growth rate reaching an 19% annual average over the next three years. Some 80% of Portuguese demand is met by imports. Last year, the U.S. import share was 39%, but the estimated real market share for U.S. trademarks, some of which are bought from U.S. companies with branch offices in Portugal or imported from European subsidiaries, is about 75%. Five U.S. companies are among the 20 largest computer software companies in Portugal.

Internet, E-Commerce and Services

Data Transmission Services (DTs), including Internet services, are fully liberalized in Portugal. Presently, there are 32 licensed operators offering services, such as; data transmission services, E-mail, EDI, fax storage and transmission and videotext. Internet linkage is an important DTS in Portugal, especially for large companies. The Internet has also become very popular and as a result, Internet-based services have expanded quickly. However, growth has been slower than experienced in other Western European countries, but since January 2000, this situation has been changing due to the great majority of Portuguese ISPs, which are offering free access to the Internet.

Telepac, a Portugal Telecom (PT)* -owned company, is chartered to provide all types of DTS (Data Transmission Services) and is the principal Internet service provider. DTS, excluding Internet services, accounted for 95% of Telepac's business in 1996. However, Telepac has started to face some competition from other operators offering DTS. The most important is Comnexo with a market share of 9%. Comnexo maintains a strategic agreement with British Telecom. Other operators are starting to offer a growing presence in DTS. They include AT&T, Global One, TMI, Eunet, and Compensa (100% owned by IBM).

Internet services are new to Portugal. In fact, there were only about 56,000 paying subscribers and 270,000 non-paying users in 1999. Approximately one quarter of the total investment contributed to this sector was made for the offering of Internet services. Presently, 25 companies offer Internet access. Telepac still controls more than 75% of the

market with 261 POPs (Points of Presence) throughout the country serving some 130,000 clients.

E-Commerce revenues are expected to grow from $200 million in 2001 to $2.5 billion in 2003, which would represent an increase of 125%. The GOP plans to invest about $500 million in the next two years to "close the digital divide" bringing Internet access to a goal of 25% of the Portuguese population. EU structural and cohesion funds should account for approximately $150 million of this investment. In 2001, only 7.1% of Portuguese Internet sites permitted commercial transactions. A majority of online traders use the Internet only to provide information regarding their products and services. The quality level of these sites, measured in terms of interactivity, personalization, and after sale support to clients is low.

U.S. companies are in an excellent position to take advantage of Portugal's entry in the "New Economy" because of their advanced technology. The GOP is looking at unbundling the local loop in favor of fixed wireless and broad band technologies. The EU seeks to reach 50% penetration of the Internet in all EU countries by 2002. Portuguese penetration is expected to reach 30% by 2004, but it will require more investment in personal computers and a major effort to encourage Portuguese companies to sell over the Internet. Currently, about 15 percent of the population have access to the Internet. Major U.S. companies such as Microsoft, Cisco Systems, IBM, Hewlett Packard, Sun Microsystems, and Oracle have educational programs with the government and private institutions to expand Internet penetration.

Contact Information:

Sergio Neves
Commercial Specialist
U.S. Embassy - FCS
Avenida das Forcas Armadas
1600 Lisbon, Portugal
Tel: + 351-21-770-2529
Fax: + 351-21-726-8914
Sergio.Neves@mail.doc.gov

Romania

Telecom

The ICT sector is probably the most dynamic component of Romania's economy, and definitely one that is receiving priority attention from the government. Over the last ten years, it has experienced impressive growth, offering Romania the latest technologies in most branches of telecommunications. According to industry sources, estimations for 2002 put the total size of the telecom services market at about $1.8 billion. The most significant recent development in the sector was the liberalization of the market for fixed telephony as of January 1, 2003. This is expected to increase competition in the whole sector, with positive effects on both the quality and the cost of services.

Although faced with strong competition coming mostly from Western European companies, U.S. firms are well represented on the Romanian ICT market, especially in the IT sub-sector and in wireless, cable, and mobile communications. Best prospects for U.S. exports include wireless communications equipment, cable communications equipment and services, 3G mobile communications (especially CDMA) equipment and services, and Internet services, VoIP included. Romanian imports of PCs, network interfaces and other communication interfaces, as well as of multimedia equipment, will continue to come mostly from U.S. suppliers. So will software for advanced IT applications.

Fixed telephony
The fixed telephony market was liberalized on January 1, 2003. This caused the national operator RomTelecom to lose its monopoly of basic voice services. RomTelecom, which is owned by the Romanian government (46%) and the Greek operator OTE (54%), will continue, however, to have a dominant position in the market for the foreseeable future. At mid-2002, RomTelecom had a total of about 4.4 million lines, of which 65% were digital. The length of its fiber optic backbone network was about 19,000 km. The average wire-based penetration was 20%.

Industry sources estimate that, over the short term, market liberalization will mainly affect RomTelecom's long distance (domestic and international) service margins. This will happen because new operators will find it less costly to interconnect to RomTelecom's backbone and provide long-distance services than to get access to the local loop or build last-mile infrastructure. However, as free market develops, RomTelecom will face increasingly stronger competition. To prepare for this, the company plans to emphasize further digitalization of its network, to provide better support for ISDN and Internet/VoIP, and to diversify its services. RomTelecom has created subsidiaries in mobile communications, CATV, and ISP, but their market share is small, and their fate uncertain in the event of a restructuring of RomTelecom's activities.

Wireless communications
The National Radio-communications Company (SNR) provides broadcasting and data transmission services through its microwave network (partially digital), its national radio and TV transmitters and transponders network, and its satellite earth stations (fully digital). It also provides transmission capacities for public and mobile telephony, paging, trunked radio, cable TV, and data transmissions. In 2001, SNR launched Romania's first pilot project for point-multipoint data transmission in the 26 GHz broadband. In January 2002, it inaugurated a new platform at Cheia satellite earth station to increase data transmission capacity and offer VoIP services via satellite. An U.S. Eximbank-supported project to modernize and expand SNR's broadcast infrastructure is underway. Under this project, the U.S. company Harris and its subcontractor Cisco will supply equipment worth $80 million.

According to its short-term strategy, SNR will emphasize diversification, trying to become an active player also on the market for fixed telephony and multimedia services. The company's privatization will likely start in 2004. In mid-2001, the U.S. Trade and Development Agency organized an orientation visit for Romanian Ministry of Communications and SNR officials to introduce SNR to U.S. companies potentially interested in SNR's privatization.

Mobile communications
This sub-sector has developed dramatically in Romania over the last five years. Mobile penetration has surpassed the fixed one, and is expected to reach 22% by the end of 2002. There are four providers of cell telephony, with a total of more than 5 million subscribers: Mobifon (GSM 900 MHz), Orange (GSM 900 MHz), Cosmorom (DCS 1800 MHz), and Telemobil (CDMA 450 MHz). Mobifon and Orange account for 95% of the mobile market.

The most revolutionary development on this market was the launching, in late 2001, of the CDMA digital 450 MHz network by Telemobil, an operator promoted by the U.S. firm Qualcomm. Romania became the first country to deploy CDMA 2000 in Europe and the first in the world to build a high-speed (153 kbs) mobile digital 450 MHz network using the CDMA technology.

The next three years will see the further development of broadband applications, as well as of such data transmission technologies as Terrestrial Trunked Radio and General Packet Radio Service (to become predominant at the end of 2003).

In late 2002, the Ministry of Communications and IT will organize an international tender to grant four 3G licenses valid for 15 years. Each license winner will pay a total of $35 million for the freeing of the frequency spectrum. Spectrum allotted to 3G communications will be in the range of 1900-1980 MHz (currently owned by the Ministry of National Defense) and in the range of 2110-2170 MHz. The $35 million fee will be paid in six installments: the first ($10.5 million) payable by January 30, 2003, and the other five ($4.9 million each) payable by January 30 of each year, starting with 2004.

Cable communications
Cable communications, too, have experienced fast development. According to industry sources, there are about 250 cable TV operators in Romania, with a total of about 3 million subscribers. The average penetration to homes is 45% (75% in urban areas and 15% in rural areas). Intensive consolidation has resulted in the top seven players having 80% of the market. Of the top seven operators, four (Astral, Romanian Cable Systems, UPC Romania, and Romsat Cable TV) are partially or wholly U.S.-owned.

Further development of the market will call for substantial investment because it implies upgrading all systems and completely rebuilding many of the old ones, so that they can carry large amounts of data (high-speed Internet). Following the deregulation of the telecom market, leading cable TV operators, which have also wireless access licenses, are very well placed to offer both switched and VoIP solutions.

Government role
The liberalization of the telecom market has called for the creation of a new set of pertinent legislation and of a new, independent, regulatory authority. The basic piece of legislation is Government Emergency Ordinance No. 79/2002 on regulating the communications sector. It was drafted in accordance with the E.U. Directive 2002/20/EC, and it is intended to ensure free access and strong competition on the electronic communications market.

On the basis of this Ordinance, a National Regulatory Authority for Communications (NRAC) has been created. Its functioning was approved by Government Decision No. 880/2002, and it became operational on September 25, 2002. NRAC is a public institution subordinated to the Romanian government. Its main mission is to implement the Government's policy in electronic communications and postal services. Specifically, NRAC will promote fair competition in all sectors of electronic communications and postal services, will ensure the interoperability of communication services by efficient interconnection contracts, and will prevent abuse by the significant operators in the market by setting specific obligations for them.

General authorizations.
One of the most important provisions of the Ordinance is that all operators of communications networks and all suppliers of related services are allowed access on the market on the basis of just a general authorization. To get an authorization, any entity interested in operating an electronic communications network or providing related services needs only to send NRAC a notification at least seven days before the commencement of its activity. Authorizations will be granted at no cost. Non-compliance with the quality standards stipulated in authorizations will cause their holders to lose their licenses.

Licenses for the use of numbering resources are issued by NRAC, for a fee.

Licenses for the use of frequencies are issued by the Ministry of Communications and IT, for a fee. Before issuing a license, the Ministry needs to get the technical approval of the General Inspectorate for Communications and IT, which monitors the frequency spectrum and assigns frequencies.

Type approvals for terminal equipment are issued by the General Inspectorate for Communications and IT. In agreement with E.U. legislation, such approvals will be granted based on the manufacturer's conformity statement.

Tariff and non-tariff barriers

The access of U.S. companies to the Romanian ICT market is not hindered by any tariff barriers, all telecommunications equipment (HS 8517) being exempt from customs duties.

Legislation regarding patents, trademarks, copyrights, and other types of intellectual property rights is in agreement with E.U. practices and ensures protection against IPR infringement. However, law enforcing is far from satisfactory, especially in the IT sector, where software piracy has caused foreign companies significant losses. Cyber crime is also a problem. The Romanian government is aware of this issues and is working with local and international enforcement bodies to identify solutions.

Market access strategies

Given the complexity of the ICT sector and the general difficulty of doing business in a transition economy, U.S. companies interested in exporting goods and services to Romania are strongly encouraged to start by developing a good knowledge of the market. This can be achieved easier by working with a reliable local partner that has extensive experience in doing business in Romania and in other CEE countries. The U.S. Commercial Service, through its International Partner Search program, can help new-to-market U.S. companies find experienced local companies willing to act as agents, distributors, or representatives.

Whenever feasible, communications and IT equipment manufacturers should take advantage of Romania's skilled labor to form joint ventures or to establish production facilities in Romania. A very positive example is offered by the U.S. company Solectron, whose facility in Timisoara (a greenfield investment) manufactures computer hardware for both the domestic market and for export.

In concluding a deal, product quality, price, and payment conditions are the most important factors for Romanian importers. The Romanian market is still cash poor. That is why a company's willingness to entertain long-term credit arrangements, co-production ventures, or, in some cases, barter transactions will give it a competitive edge over others interested in doing business in the same field.

Financing

Major ICT projects initiated by the Romanian government for infrastructure modernization are financed by the interested public entities, sometimes with the help of loans from international financial institutions (World Bank, EBRD, EIB), foreign government grants, supplier credits, and E.U. PHARE assistance. Contracts for such projects are awarded via international tender.

The Export-Import Bank of the United States (Eximbank) may grant short-term (180 days) coverage for U.S. exports to Romania, and medium-term and long-term coverage for public sector projects. A recent example is the Eximbank-supported $80 million project to modernize and expand SNR's broadcast infrastructure.

U.S. project financing and insurance can be provided by the Overseas Private Investment Corporation (OPIC), which offers direct loans, loan guarantees, and political risk insurance.

Romania became eligible for U.S. Trade and Development Agency (TDA) program funding in 1991. Since then, almost 50 grants have been provided for feasibility studies, many of which were for ICT projects. Some of the U.S. companies that have so far entered the Romanian ICT market have used the results of TDA-funded feasibility studies to build pilot projects and demonstrate the efficiency of their products and technologies. TDA has also financed Romanian participation in telecom conferences and training, as well as orientation visits to the United States for officials and experts in the ICT sector.

Hardware

In 2003, the Romanian Information Technology and Communications (ITC) market saw a continuation of its previous upward trend. Sales increased by 20% in comparison with 2002 sales, partially because of a large infrastructure project launched in the public sector which focused on hardware acquisition.

Market Players
The following companies are the main Romanian-based market players:

	Company	Turnover (in millions of dollars)
1	**Intrarom**	**56.7**
2	**Flamingo Computers**	**34.9**
3	**K Tech Electronics**	**21.6**
4	**Acerline International**	**20.8**
5	**Ultra Pro Computers**	**11.8**
6	**Universum Computers**	**10.5**
7	**Ager Business Tech**	**8.1**
8	**Eta-2u**	**7.7**
9	**Ager Business Solutions**	**7.4**
10	**Comrace Computers**	**6.2**
11	**Cisco?**	

About 45% of the computer hardware market is supplied by local system integrators, several of which have the status of original equipment manufacturers. Imports account for the remaining 55% of the market, and come mainly from traditional U.S. suppliers such as IBM, Hewlett-Packard/Compaq, Cisco and Dell. In 2003, several companies, following Dell's lead, increased their presence in the Romanian market.

Government Role
The Ministry of Communications and Information Technology is responsible for the Romanian ITC sector, its role being to develop Romanian governmental policy in this area.

Current governmental policies are being oriented toward the introduction and development of the so-called "Information Society" concept at the national level, establishing the institutional framework and paving the way for advanced technologies. Laws and regulations specific to the ITC sector are being drafted with an eye toward similar EU legislation, in an attempt to implement the EU "Aquis Communautaire".

Another important legislative body is the Romanian Parliament's IT Commission.

Infrastructure and Technology
The PC penetration rate in Romania was estimated at 10% for 2003. The Ministry of Communications and Information Technology estimates that in 2004, the PC penetration rate will total 15%, representing 146 million Euros in sales. It is expected that this positive trend will be maintained through 2006, at which time the penetration rate should total 25%.

The Internet was utilized by only about 9% of the population in 2003, but it is estimated that a positive growth rate will be realized, and that usage should reach 13% by 2006. The number of Internet providers in 2003 totaled 220, and it is expected that this level will be maintained throughout 2004.

Although faced with strong competition from Western European companies, US firms are well represented in the Romanian ITC market, most notably with exports including wireless communications equipment, cable communications equipment and services, 3G mobile communications (especially CDMA) equipment and services, and Internet services (VoIP included). Romanian imports of PCs, network and other communication interfaces, and multimedia equipment, will continue to come predominately from US suppliers.

Mobile Communications
This sub-sector has developed dramatically within Romania over the last five years, with mobile penetration now surpassing that of fixed. More than five million subscribers are serviced by four providers of cell telephony, those being Connex (GSM 900 MHz), Orange (GSM 900 MHz), Cosmorom (DCS 1800 MHz), and Telemobil (CDMA 450 MHz). Connex and Orange account for 95% of the mobile market.

The most revolutionary development in this market was the launching, in late 2001, of the CDMA digital 450 MHz network by Telemobil, a subsidiary of the U.S. firm Qualcomm. Romania became the first country to deploy CDMA in Europe, and the first in the world to build a high-speed (153 kbs) mobile digital 450 MHz network using the CDMA technology.

The next three years will see the further development of broadband applications, as well as data transmission technologies such as Terrestrial Trunked Radio and General Packet Radio services (to become predominant by the end of 2003).

Cable Communications
Cable communications, too, have experienced dramatic development. According to industry sources, there are nearly 250 cable television operators in Romania, comprising a total of about 3 million subscribers with an average penetration to homes of 45% (75% in urban areas and 15% in rural areas). Intensive consolidation has resulted in the top seven players having 80% of the market. Of the top seven operators, four (Astral, Romanian Cable Systems, UPC Romania, and Romsat Cable TV) are partially or wholly US-owned.

Further development of the market will call for substantial investment, because it implies upgrading all systems or in many cases, completely rebuilding the older ones, to ensure that they can accommodate larger amounts of data ie: high-speed Internet. Following the deregulation of the telecommunications market, the leading cable TV operators, many of which also have wireless access licenses, are very well placed to offer both switched and VoIP products.

Future Prospects and Opportunities

The Romanian ITC industry is in an early but constantly growing stage of development, with the prospects of reaching a favorable maturity stage being supported by observable trends, such as internal market orientation, development of complex projects and the growing interest of managers in IT products.

The growth of internal market sales is rapidly outpacing Romanian ITC product exports, and software sales are steadily gaining ground against hardware sales as clients become increasingly more interested in complex projects. IT managers, company executives and even marketing and development managers have begun to show a higher degree of trust and interest in equating IT solutions with viable business solutions.

The table below illustrates Romanian ITC growth trends, which remained positive even during the recession years of the world IT market.

IT Industry

	1998	1999	2000	2001	2002
Turnover (in millions of dollars)	295	280	324	450	798
Value Added (in millions of dollars)	56	57	90	144	232
Exports (in millions of dollars)	22	35	70	101	170
Number of Companies	3,160	3,632	4,257	5,152	6,484
Number of employees	11,000	11,710	14,842	18,308	22,089

The Romanian ITC market registered a growth of 12% between 2001 and 2002, representing a total of 680 Million €. (If the table is in USD, why express growth in Euros?) If the present rate of growth (which is greater than Eastern European regional averages) can be maintained, it will be superior to the rate of growth of most of the Eastern-European countries by the year 2005.

Hardware manufacturing, which suffered a strong collapse after 1989, regained its profitability when it began assembling equipment comprised predominately of imported components, mainly from Asian sources. Production quality, efficiency of the assembling processes, intelligent design and efficient management enabled the hardware segment to recapture 48-50% of the Romanian market, or about 50,000 PCs yearly, with many firms receiving ISO 9001 certification.

System configuration, hardware sales, installation, training and service are generally provided by a number of private integrator firms, which offer these services for software products as well. These firms average 10-15 employees and typically have a high turnover due to the fact that they also carry out services for successful international firms. Foreign firms in the field have an active presence in Romania by means of local distributors and integrators, and account for approximately 50% of the hardware equipment market.

Information Technology and Communication currently constitutes one of the most dynamic sectors in the Romanian economy.

Software

In 2003, the Romanian Information Technology and Communications (ITC) market saw a continuation of its previous upward trend. Sales increased by 20% in comparison with 2002, primarily due to a renewed focus in the hardware and integrated IT services area. The acquisition of RAV and GECAD technology by Microsoft also generated an increase in software production, while the communication sub-sector realized substantial growth, as well.

Local companies supply almost 60% of the computer software used in Romania, providing mainly specialized telecommunications programs and programs for industrial surveillance, control, and security. Of the country's more than 2,000 software development companies, many are exporting their services to the EU and North American markets. Imports cover the remaining 40% of the software market. Almost 75% of all foreign software products in Romania are American, and most of the larger U.S. software companies have a presence within the country, with Microsoft and Oracle leading the import market. Although faced with strong competition coming mostly from Western European companies, U.S. firms maintain a predominance in the Romanian ITC market.

For 2004, a growth rate similar to 2003 is estimated, with an increased potential for new applications with digital content.

Market Players
The following companies are the main market players:

	Company	**Sales** (in millions of dollars)
1	**IBM Romania**	**25.4**
2	**Romsys**	**23.9**
3	**Forte Company**	**20.3**
4	**C.N.D.P.I. (Romsoft)**	**14.4**
5	**Asbis Romania**	**14.0**
6	**Asesoft International**	**12.4**
7	**Siemens Automotive**	**11.5**
8	**S & T Romania**	**9.6**
9	**Siveco Romania**	**8.7**
10	**Ager Distribution**	**8.4**

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Software and Services Industry

		1998	1999	2000	2001	2002
Sales	(in millions of dollars)	160	163	233	350	533
Value Added	(in millions of dollars)	42	46	79	132	192
5Exports	(in millions of dollars)	19	31	68	98	150
Number of Companies		2,955	3,408	4,025	4,864	6,071
Number of Employees		9,213	9,988	13,096	16,530	17,900

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Last year, Romanian software exports grew to almost 200 million US dollars. The software association ANIS estimates for this year predict continued growth to almost 230 million US dollars.

When considering piracy reduction as an engine for significant growth within the IT sector, the Romanian ITC market could reach $660 million by 2006, an increase of 76% contingent upon software piracy being reduced by 10 % per year. In Romania, software piracy has dropped from 86 % in 1996 to 75 % in 2001.

System configuration, hardware sales, installation, training and service are generally provided by a number of private integrator firms, which offer these services for software products as well. These firms average 10-15 employees and typically have a high turnover due to the fact that they also carry out services for successful international firms.

Information Technology and Communications constitutes one of the most dynamic sectors in Romania, and presents many opportunities to increase the efficiency of the economy, as well as to develop value-added to the export industry.

Contact information

Adriana Mircea
Commercial Assistant
U.S. Embassy - FCS
7-9 Tudor Arghezi Str, Sector 1
Bucharest, Romania
Tel:+40-21-210-40-42 (x342)
Fax: + 40-21-210-06-90
Adriana.Mircea@mail.doc.gov

Russia

Telecom

Market Players

The major Russian telecommunications holding company, Svyazinvest, was founded in 1994 to consolidate the government-owned shares in Russia's regional operators. It remains 75 percent state-owned, although the government plans to sell all or part of its share in the near future. Svyazinvest has recently restructured its holdings, consolidating 70 regional phone companies into seven 'super regional' telecom providers, and increased its capitalization from $1 billion at the initial phase of the reform in January 2001 to $1.8 billion. Svyazinvest's subsidiaries make up the universe of Incumbent Local Exchange Carriers (ILECs). In addition to its controlling interest in 7 super regional telecommunications service, Svyazinvest controls Rostelecom, the major nation-wide backbone operator. Recently the Russian government approved a plan for next year that involves the sale of the state's interests in four interregional companies, including Southern Telecom, in which 0.09% of the charter capital will be privatized, CenterTelecom (7.2%), VolgaTelecom (0.6%), and Ural Svyazinform (4.37%).

Rostelecom, controlled by Svyazinvest, is Russia's national backbone operator, servicing around 75% of Russia's international traffic. However, the company has lost an estimated 20% of international and 10% of domestic long-distance market to competitors. Despite the difficulty that new market entrants meet in obtaining licenses, Rostelecom is facing current competitive threats from the CLECs that provide long-distance services, such as Golden Telecom, Sistema Telecom, Global One, and Combellga.

Three huge enterprises, not primarily involved in telecommunications, have built long-distance telecommunications infrastructure along their rights of way, may in time emerge as major competitors in the sector. Gazprom, the giant gas utility created a telecommunications subsidiary, Gazsvyaz. Similarly the electric utility, UES, created UES Telecom. The most advanced project, however is the Ministry of Railways' Transtelecom, which owns 45,000 km fiber optic line throughout the country.

Vimpelcom, MTS (controlled by Sistema) and Megafon have emerged as the dominant companies in the fast growing mobile telephone market. This year the fourth GSM operator TELE2 began its operations in Russia. Sweden's Tele2 is investing $80 million in construction of GSM-standard mobile networks in Russia. Tele2 holds controlling stakes in eleven mobile operators, and currently owns 4 GSM networks in Irkutsk, Rostov, Kemerovo and St. Petersburg.

Government Role

On July 7, President Putin signed Russia's new Law on Communications, which will go into effect on January 1, 2004. Authored by the Ministry of Telecommunications(Minsvyaz), the Law outlines and reinforces the regulatory authority of Minsvyaz and sets the legal basis for the telecommunications industry.

It is the first major overhaul of telecommunications legislation in Russia in over eight years. While the government has widely publicized the consumer benefits written into the Law - the provision of universal services and price controls in the form of the choice of billing methods - the Law still fails to clarify such issues as transparency in the licensing and frequency allocation processes.

Infrastructure and Technology

Based on the Ministry of Economic Development and Trade's report, the volume of services provided by communications companies in Russia could grow to USD 22 billion in 2006, from USD 15 billion forecasted in 2004.

The telecommunications infrastructure is of inconsistent quality and accessibility throughout Russia. While major population centers are quite well served, large areas of this vast country have extremely poor access, or none at all. In rural areas there are an estimated 54,000 small communities with no telephone access whatsoever. In the country as a whole, there are a mere 22 phone lines per 100 people, and the waiting list for basic services currently has 5 million names.

At the beginning of 2003, Russia had over 32 million telephone numbers, up from 29.7 million on January 1, 2002. However, over the course of the past few years, telecommunication industry has become one of the most dynamic sectors. The number of telephones installed by traditional Russian networks increased 4.6% year-on-year to 32.856 million units in the first half of 2003. The number of payphones of all types decreased by 7.4% year-on-year to 167,038 in the first half of 2003. However, the number of card payphones rose by 9.7% to 118,365. The number of long-distance payphones decreased from 10,000 to 7,600. The number of public Internet access stations rose 71% in the first half to 5,746, and the number of telematic and data transmission sets jumped 97% to 1.226 million.

According to forecasts from RTKomm.RU, the total market for Internet services in Russia in 2003 will increase to $350 million from $280 million in 2002. This includes the share of RTKomm.RU of $35 million ($26 million in 2002); Transtelecom - $20 million ($16 million), Golden Telecom - $31 million ($25 million), MTU-Intel - $24 million ($18 million), large Svyazinvest inter-regional companies - $190 million ($150 million), and other operators - $50 million ($45 million).

Wireless communications

There were some 27.01 million mobile phone subscribers in Russia at the beginning of August 2003, as compared with 18 million by the beginning of the year. According to a J'Son & Partners research report mobile services penetration was 18.6% across Russia in August 2003, but as high as 56% in Moscow and 45% in St. Petersburg.

Mobile TeleSystems (MTS) is the leading cellular operator, with a client base of 9.91 million, 4.3 million of whom live in its Moscow zone. VimpelCom has 7.95 million customers, including 4.65 million in the Moscow zone. MegaFon had 4.65 million clients by the end of July 2003, including 513,000 in the Moscow zone. The top ten Russian cellular operators also include the group SMARTS - 860,000 subscribers,

Uralsvyazinform - 837,000 (including subscribers to Uralwestcom, Ermak RMS and South Urals Cellular Communications), Nizhny Novgorod Cellular Communications - 268,000, Tomsk Cellular Communications - 170,000, Yekaterinburg Cellular Communications - 156,000 and Sibchallenge (Krasnoyarsk) - 138,000 subscribers.

GSM standard dominated the market (82% share) while ADMPS/TDMA and NMT-450 operators respectively had 11.6% and 6% of the market.

Broadband

Based on research by RosBusinessConsulting (RBC) on developments of the broadband wireless access (BWA) market in Russia, the annual BWA market size is estimated at $12 million. The lion's share of this market (47%) is concentrated in Moscow. However, to date, there are an estimated 171 BWA networks in over 80 Russian cities. According to the analysis, in 2003 equipment sales may grow 100-150% in the heretofore undeveloped regional markets, and 50% in the more mature Moscow market. Existing BWA operators estimate that over the next 2 years the annual Russian broadband fixed wireless market size may reach $40 million.

There is a growing need for BWA solutions in Russia, especially as an effective means for "last mile" connection. The wireless network improves connection quality in numerous locations throughout Russia's sparsely populated provinces where other solutions are not cost-effective. The 2.4, 3.4-3.6, 5.2, 5.8-6.4, 11 and 28 Ghz frequencies are used in Russia to provide BWA access. As 2.4 Ghz frequency band, heavily used for Wi-Fi systems, has reached its saturation point, the majority of existing broadband wireless deployments in Russia are considering a shift to the 3.5 and 5.3 Ghz bands. Many analysts consider these bands as a major network opportunity, however cumbersome frequency regulations impede development.

While the BWA market in Russian is rapidly growing, there are still a number of barriers hampering further developments. These include a lack of frequency resources and cumbersome frequency regulation procedures, high equipment costs, lack of noise immunity and a large number of non-authorized users, especially in the large cities.

Future Prospects/Opportunities

Continued growth in the Russian telecommunications services market will yield business opportunities for competitive U.S. telecommunications equipment suppliers. The broadband fixed wireless (BFW) market represents a range of opportunities for US companies. With the introduction of Wi-Fi technology in Russia, sales of Wireless Local Area Networks (WLAN) grew significantly. As the 2.4 Ghz frequencies band has almost reached its saturation point, the majority of existing broadband wireless deployments in Russia are based on the 3.5 and 5.3 Ghz bands. Many analysts consider these bands as a key to network opportunities. Development of xDSL, cable and digital TV will present lucrative opportunities for US vendors. The cellular services market is expected to continue its steady growth expanding further into the Russian regions. Analysts predict that the overall ICT market will reach $20 billion by 2005. The best sales prospects also

include digital switching equipment, high-speed, broadband Internet access technologies, multi-service and multimedia solutions, including SDH, xDSL, ISDN, DWDM, BWA, and call center equipment.

Hardware

The Russian Information Technology sector represents a growing market for U.S. suppliers. Receptivity to U.S. products is high. Sales of computer hardware, software, services and value added services are estimated at around $4.5 billion for 2003 (approx. 1.2-1.5 percent of Russian GDP), an increase of around 15 percent over 2002. Although IT penetration in Russia is still relatively low, the Russian IT market is expected to grow at an annual rate of 14-16 percent over the next 10 years, making it one of the fastest growing markets in the world. This growth is due to favorable economic conditions and high demand in the corporate sector, especially from industries with healthy cash flows such as oil and gas, metallurgy, finance and insurance, telecommunications and retail.

Hardware is the major IT segment and accounts for 80 percent of the whole Russian market. The main trends of the hardware market in 2002-2003 were strong growth in laptop and portable PCs sales with an increase of 50 percent, rapid growth of sales in the Russian regions and sizable increases in corporate purchases. Imports accounts for 15-18 percent of Russia's computer market while most of the demand for PCs was met by domestic brands incorporating foreign-made components. Peripherals, networking and larger system hardware are dominated by imports. According to the Russian Ministry of Communications, the total number of computers (PCs, laptops and servers) in Russia exceeded 13 million in 2003, an increase of 2.5 million (24 percent) over the previous year. The penetration rate of around 9 percent is still low for a country with such a highly educated population as Russia's, a result of low (but rising) income levels. However, many Russians have updated their equipment over the last few years in order to gain better Internet access. This trend is likely to accelerate as income levels continue to rise.

Market Players
The Russian market is dominated by locally assembled PCs using mainly foreign-made components due to price sensitivity. These local producers, who emerged after the 1998 devaluation of the Russian ruble, compete successfully against imports in the low end of the market and have forced importers to keep prices low. According to industry sources, the demand for PCs is growing 20 percent year on year. The major Russian computer producers currently are Aquarius, K-Systems, Kraftway, Formoza, R&K, R-Style, ISM.

Industry sources report that foreign brands account for a mere 18 percent of total PC sales in Russia. The import duties on electronic components are low and it is profitable to import components and assemble the hardware at site. However, major Russian corporations and foreign multinationals often prefer to purchase well-known brands such as Hewlett Packard, IBM and Dell. According to the research firm IT Research, in 2003 notebook sales accounted for 170,000 units as compared to 109,000 units in 2002. The considerable growth in sales was due to a worldwide drop in PC prices, competition from a wider range of brands becoming available on the market and rising incomes. The main suppliers of portable PCs in Russia are: Rover, Toshiba, Hewlett-Packards, ASYSTek, Fujitsu Siemens and iRU (a new Russian brand of NK Group).

Government Role
State orders have become an important demand driver for IT products. In May 2003, the Russian government launched the second stage of its "E-Russia" program by awarding 10 pilot projects to 6 companies as an early part of the $2.4 billion, eight-year initiative to make many government services available online and combat bureaucratic inefficiencies. The projects tendered were worth of $3.6 million over the next two years.

Government priorities for the next few years are as follows:

- To provide better Internet access to more Russian citizens and public sector organizations.
- To stimulate investment in the development of Internet technologies, including support to domestic developers.

To build a legislative and regulatory framework for the sector - a new Law on Telecommunications comes into force on January 1, 2004 and the Law on Electronic Signature should be adapted by new legislation

Market Driving Forces
The main trends, which characterized the Russian IT market in 2002-2003 included: Internet services market growth; increased IT spending by industrial enterprises, retail and wholesale companies as well as telecommunication service providers; IT distributors expansion from their traditional markets in Moscow and St. Petersburg into Russia's regions (36 percent growth of sales in the regions); increase in Government procurement; laptop and server markets grew faster than the desktop market; Demand for Enterprise Management Software increased

The major groups of IT end-users included: multinational companies; government agencies and institutions (participants of E-Russia program); local exporters of basic commodities (oil and gas industry, metallurgy, energy and construction industry); Russian companies, with progressive management seeking to increasing operational efficiency (telecom companies, freight and automotive industry, food processors); small and medium sized Russian firms, which are growing in number and becoming an economic force in the country.

Future Prospects/Opportunities
Approximately 11 percent of the Russian population use PC's at home. Despite the generally low-income levels, Russians tend to look for versatile, high-end computers that can perform multimedia functions, and in 2003 a growing number were prepared to pay more for high quality. Moscow and St. Petersburg have been the most important computer markets to date. However, other large population centers in Russia's regions have been attracting the interest of suppliers and distributors. The longer-term opportunities for expansion in the regions are, under the right economic conditions, almost limitless. Good opportunities and best immediate sales prospects for U.S. companies in the Russian IT market exist in the following market segments: Hardware: computer peripherals, laptops, servers and Internet technology devices.

Software

Market Players
Software Outsourcing represents a fast-growing sector, in which Russia has a cost advantage. Growing by as much as 50 percent per annum, it is estimated that Russian offshore software development (OSD) revenues could be in the range of $240-300 million for 2003. Global leaders such as Intel, Motorola, Sun Microsystems, Boeing, Northern Telecom and others have opened their own R&D, design and software development centers in Russia. Anti-virus security and Internet security consulting are the most rapidly growing segments in Russia. There are about 20 Russian developers of Information Security Solutions: Informzaschita, Kaspersky Labs, Jet Infosystems, NPP Gamma, OKB SAPR, among others. Anti-virus protection in one sector where Russian software companies are very competitive and have had export successes. Kaspersky Labs is one of the top-ten global sellers of anti-virus software, and is seeking to capture 5 percent of the global anti-virus market. The distribution network of Kaspersky Lab extends to over 40 countries.

Government Role
The Russian IT security market is fully regulated by the state and in 2003 there were crucial changes in the regulations. The Federal Agency for Government Communications (FAPSI), which had responsibility for the sector, was abolished and many of its functions were taken over by the Federal Security Service (FSB). On the other hand, changes in the required product standards should make it easier and quicker for foreign manufacturers to certify their products for use in Russia.

Currently the market is not fully open to foreign IT security products and some observers believe that should it become so, it will be difficult for local producers to compete with such leaders as Microsoft, Cisco and Checkpoint. However, industry experts believe that the information security industry is flexible and ready to respond to any demand increases.

Technology In Use
According to investment firm Brunswick Warburg, Russian enterprise solutions account for 55 % of the market, with Galaktika being a market leader. Since Russian software houses do not currently compete in the market for large ERP systems (23% of the total software market) there is a demand for imported software in this and mid-range segment. The following EMS prevail in Russia: SAP R/3, Oracle, BAAN, J.D.Edwards, Navision, SunSystems, Scala, Platinum, Galaktika, 1C and Parus.

Market Driving Forces
Despite export growth in recent years and as projected, the Russian software product industry has potential to rise further and faster. The major groups of IT end-users included: multinational companies; government agencies and institutions (participants of E-Russia program); local exporters of basic commodities (oil and gas industry, metallurgy, energy and construction industry); Russian companies, with progressive management seeking to increasing operational efficiency (telecom companies, freight and automotive industry, food processors); small and medium sized Russian firms, which are growing in number and becoming an economic force in the country.

Future Prospects/Opportunities
It is difficult to estimate the true size of Russia's rapidly expanding software market due to high level of pirated software, which is sold openly and could account for as much as 87 percent of all software sold. In legitimate sales of software, the best prospects are in corporate software including Enterprise Resource Planning products, which earned Russian companies $80 million in 2003. While local software producers are quite successful, they often lack the resources necessary for continued growth on their own. U.S. software firms hold a significant share of the Russian market. Good opportunities and best immediate sales prospects for U.S. companies in the Russian IT market exist in database management systems including ERP systems as a result of growing interest in office automation, growth in the number of medium-scale businesses and rising number of individual end-users.

Contact Information
Andrey Gidaspov
Commercial Specialist
U.S. Embassy - FCS
23/38 Bolshaya Molchanovka Street
121099 Moscow, Russia
Tel: + 7-095-737-50-36
Fax: + 7-095-737-50-33
Andrey.Gidaspov@mail.doc.gov

Serbia and Montenegro

Introduction

The union of Serbia and Montenegro (SAM), formerly known as the Federal Republic of Yugoslavia, was established in February 2003. The union consists of two constituent republics: the Republic of Serbia and the Republic of Montenegro. Serbia, the larger of the two republics accounts for 95 percent of SAM's GDP. Serbia has approximately 10 million inhabitants while Montenegro has around 600,000. Under the new state's new constitutional charter, each republic has full responsibility for the development of its telecommunications sector including the legal/regulatory framework.

Like other transition economies, there is great potential for SAM's telecommunications sector. The country as a whole suffered from the international sanctions during the 1990s that resulted in a deterioration of key infrastructure including telecommunications. Both republics are now focusing attention on the restructuring, privatization, and liberalization of telecom.

Telecom

There are two dominant telecom companies in the two republics: Telecom Serbia and Telecom Montenegro. The most current statistics (2002) indicate that Telecom Serbia has 2,380,000 fixed line subscribers while Telecom Montenegro has 195,000 subscribers. This amounts to a total of 2,577,000 fixed-line users in the country. Only 60 percent of the fixed line telephone networks have been digitalized. SAM's telephone penetration has reached an average 32.92 lines per 100 inhabitants. Serbia is recording a lower level of telepenetration than Montenegro reaching 31.15 and 35.7 respectively.

During the last five years, mobile telephone services have developed rapidly in both republics. The average annual increase in mobile subscribers is 50 percent. At the end of 2002, the country's total number of subscribers exceeded 3 million subscribers. Now, there are at least 318.47 mobile telephone subscribers per 1,000 people.

The Republic of Serbia

Telecom Serbia

Telecom Serbia is the monopoly provider of telecom services in Serbia. In 1997, Telecom Serbia was "unbundled" from the state-owned Post, Telephone & Telegraph Company (PTT Serbia) and privatized with 49 percent of the shares being sold to OTE (Greece) and Stet (Italy). In early 2003, PTT Serbia repurchased the 29 percent held by Stet (Telecom Italia), thereby increasing the state ownership to 80 percent. The Serbian government is now focusing on the restructuring of Telecom Serbia and has yet to take a decision regarding future privatization. In the meantime, the company is moving forward with "unbundling" by developing three separate, independent cost centers: fixed, mobile and internet. Telecom Serbia maintains a monopoly in voice until June 2005. TS's main activities are:

All types of fixed telecommunications services within and outside the borders of the Republic of Serbia;

Other fixed voice services;

Data transmission, telematic services, value added services, ISDN, intelligent network, fixed satellite services, fixed services for using DECT standards, Internet, multimedia;
Mobile telephony (Mobilna Telefonija Srbije MTS)
Other activities (planning, design, construction, maintenance, repairs etc.)

During the last two years, Telecom Serbia has focused its attention on improving the backbone infrastructure. It is expected that more than 90 percent of the backbone will be digitalized by 2005. Additionally, Telekom Serbia is emphasizing the development of new technology and services that will position the company to better compete when the market is liberalized.

Legal/Regulatory Framework
Until this year, Serbia's telecom sector has suffered restrictive regulation that protected Telecom Serbia from competition. In May 2003, the government of Serbia enacted a new Telecommunications Law. This law was an enormous improvement over previous legislation. The law is consistent with WTO and EU standards/requirements. The new law will, for the first time, establish an independent regulatory body. The U.S. Trade & Development Agency, through the European Bank for Reconstruction & Development, is financing technical assistance to establish the new regulatory body. The law also squarely tackles liberalization of the sector, limiting statutorily Telecom Serbia's monopoly position to June 2005.

Mobile Telephony
There are two mobile telephone operators in Serbia: Telecom Serbia and Mobtel. The latter is 51 percent owned by a private company and 49 percent owned by PTT Serbia. Following is a breakdown of mobile telephony statistics for Serbia:

Mobile Telephone Subscribers:

Mobile Telephone Penetration	Serbia	
Operator	Mobtel (063)	MTS (064)
Data Provided by The Operator in	June 2002	April 2002
Territory Coverage (%)	87%	46%
Population Coverage (%)	94%	84%
Number of Mobile Telephone Subscribers	Over 1.500.000	1.150.000
Number of Mobile Telephone Subscribers per 1000 People	176.47	135.29
Per Republic (Total, 2 operators)	311.76	

*Estimation

The demand for mobile services continues to increase annually. Mobile telephony penetration, while popular, is still relatively low with room for substantial growth. Like other transition countries, mobile telephones often replace fixed-line telephones in areas/regions where telephone penetration is low and there is a long wait for installation of fixed lines.
Future plans for Serbia's mobile telephone sector are still unclear. The government is currently involved in an argument over the ownership structure of Mobtel. It is expected that the government will increase its ownership and Mobtel will be taken out for privatization to a strategic foreign investor in 2004. Telecom Serbia's mobile unit could be sold-off separately as well or be retained as part of the company in order to enhance to the value of Telecom Serbia should a new foreign strategic partner be identified. From time to time, there has been discussion regarding the issuance of a third mobile license. But this is unlikely to occur until the ownership issue is resolved with Mobtel.

Internet Service
Serbia has approximately eight major ISPs and more than 40 local ISP subcontractors. Roughly 8,000 telephone lines (nodes) are distributed among them for dial-up connections. The number increases literally on a daily basis and cannot satisfy the rising connectivity demand. Several major ISPs have a standard of establishing the connection with less then 3 tries, except during peak hours.
There has been a proliferation of internet access through cafes and home usage. Still, home PC use is relatively low and a internet usage at a low level compared to other elsewhere in Central Europe.

Cable Services
In the late 1980s, national broadcasting company Radio-Television Serbia (RTS) received the exclusive rights for cable TV development/distribution. RTS entered into an agreement with a Canadian company that stopped its investment during the war period. Subsequently, the rights were legally transferred to PTT Serbia.
Since 2001, the demand for cable TV resulted in the establishment of several private service providers. According to the Association of YU Cable Providers, there are 22 operators of which 10 are outside Belgrade. Unofficial information indicates that there may be actually 33 service providers.
PTT Serbia, through its independent subsidiary KDS, is presently planning its own republic-wide cable development project. KDS is building a fiber optic network that will be used for multi-media services in the future (internet, data transfer, home banking, VOD, entertainment). Current plans call for the initial installation of 600,000 connections in Belgrade, 1,200 in Petrovaradin, 30,000 in Jagodina, and additionally in the cities of Nis, Kragujevac Smederevo, Soko Banja, Vranje, Vladicin Han, Paracin, Ub and others.
Serbia Broadband (SBB) is a local venture with U.S. investment from OPIC's regional equity investment fund. SBB is now examining the feasibility of building out its own fiber backbone (with U.S. TDA assistance).

The Republic of Montenegro

Telecom Montenegro

Telecom Montenegro is legal successor to Montenegro's Post, Telephone & Telegraph company (PTT Montenegro) and is the monopoly operator in the republic. The government of Montenegro holds 89 percent of the shares with the remainder held by workers. In 2002, the government attempted to privatize the company through an international tendering process geared to attract a foreign strategic partner. While operators from Austria and Greece expressed interest, neither submitted bids. The company's monopoly rights expire at the end of 2003 but might be subject to extension. Telecom Montenegro has his company has stakes in both the republic's mobile operators: 9 percent in Pro Monte and 100 percent of Monet. Services continue to improve and expand and the current level of market penetration for fixed telephony is 28 per every 100 people.

Significant investment has been made in the telecom infrastructure. Nearly 95 percent of Telecom equipment is modern digital (Stored Program Control) technology, and the transmitting network has been converted from analog to digital with optical fiber and digital radio relay links, for every purpose. During 2002, Telecom Montenegro further developed its fiber-optic transmission network and protection via ring configuration. The total capacity of SDH network was 2.5 Gbp/s and 622 Mbp/s at the end of 2002. Installed fiber-optic network capacity further increased reaching a total capacity of 1231km cable. Telekom Montenegro initiated its own international traffic routing in 1999, by establishing a Podgorica International Switch. In 2001 a second International Switch was installed increasing capacity for traffic routing and providing more quality service to the customers. The number of connected phone lines grew by 2.3% in 2002 on 2001 and came close to 195,000. Eighty-nine percent of the connected lines are used by residential consumers, while businesses use the rest. In March 2003, Telecom Montenegro started a project, called MIPnet (Montenegrin IP Network) to implement a new multi-service transmission network. The main goal of this project is to realize reliable, scalable IP network based on MPLS protocol that will provide implementation of a wide range of services such as: VPN, VoIP, Video on Demand and Remote Learning. An international bid invitation was announced in June 2002. Telecom Montenegro has elected for the partner consortium Cisco System & MDS & SAGA.

The core of the network consists of four CISCO Core Routers GSR 12406 Core Routers that will be located in Podgorica, Bijelo Polje and Bar. The initial capacity of the core network is 622 Mb/s with the possibility for upgrading to 10Gbit by changing the interface in Core Routers. The following access types are foreseen in each one of the future network's access nodes: Wireless, Serial, Ethernet, xDSL, and Dial-up. The global Internet access will be effected via two CISCO GSR 12406 MIPNet networks.

Legal/Regulatory Framework
Montenegro has its own Telecommunications Law that was passed in 2001. Regulatory oversight is provided through the Ministry of Transportation and Telecommunications but more directly through the independent regulatory body, the Telecommunications Agency. While the law maintains the monopoly rights of Telecom Montenegro for a limited period of time, like Serbia the new legislation was a vast improvement in terms of providing for future liberalization.

Priorities in the telecom sector in 2003, pursuant to law, are the following:

Resolution of the key regulatory issues necessary for full liberalization of the telecommunications sector and allowing competition in all telecommunication services.
Design of the Telecommunications development plan of both governments, by which a strategy for further development of this sector should be defined
Realization and financing of universal service
Overview of the regulatory framework for licensing, revision of issued licenses and preparation for issuing new telecommunications licenses (for international services, VOIP, callback, leased lines, and others)
Monitoring and supervision of the radio spectrum and respecting the needs of all civil users of the spectrum (functional systems, aviation, maritime, broadcasting,..) and also exclusive users (army, police) and organization of radio spectrum monitoring service.

Mobile Telephony
There are two mobile operators in Montenegro: Pro Monte and Monet.

ProMonte GSM: a Greek-Norwegian consortium ETL (European Telecom Luxembourg). ETL is a joint venture company formed by Telenor Mobile Communications AS, Wcom Investments, West South Tel., and TopStar Shipping.
Monet d.o.o: a 100 percent owned subsidiary of Telecom Montenegro. Today Monet registers around 150,000 subscribers and has 22.3 percent market penetration.

Together, ProMonte GSM and Monet cover 97 percent of the republic's territory with ProMonte covering 81 percent and Monet 64 percent. At the end of 2002, the number of active customers (SIM cards) was 445,040. This corresponds to 67 percent of customers using mobile phones. This level of penetration is one of the highest in this region and is slightly under the average in EU member states. The number of mobile phone users in 2002 increased by 88,846 in comparison to the previous year. A significant increase of mobile phone users followed the establishment of the second mobile operator in 2000.

The introduction of competition on the market has not only resulted in an increase in the number of users, but also in a range of new services made available to customers. Domestic traffic prevails with both operators (over 90%). With regard to number of roaming partners, ProMonte GSM is in a more favorable position as it has signed 134 commercial agreements in 67 countries, while Monet has only 80 commercial agreements signed in 53 countries.

Internet Services
Two companies have received licenses for rendering Internet services:
Internet Montenegro, operational since 1997 with 15% of state participation and 25% Telekom's participation. At the moment, Internet CG has over 32.000 dial-up users and intends to further increase this number. The number of commercial users of leased lines exceeds a figure of 70 large companies.
Informatics Montenegro, a Podgorica based company was awarded a license in November 2002.

Broadband services have started to encroach on dial-up services among businesses/domestic users although dial –up continues to be the dominant Internet access method for consumers. This is still the cheapest form of access. Available subscription fees and pre-paid dial up services increased 49.1 percent in 2002. Internet Montenegro offers a direct line to Internet in various forms: 64Kbps, 128Kbps, 192Kbps, 256Kbps, 512Kbps, 1Mbps, 2Mbps. In 2002, there were 66 leased lines of different capacities. The number of leased lines in 2002 increased by 34.7 percent on the previous year.

FCS Contact Information Serbia & Montenegro:
Zorica Mihajlovi
Senior Commercial Specialist
U.S. Embassy - FCS
Kneza Milosa 50
11000 Belgrade, Serbia & Montenegro
Tel: + 381-11-306-4910
Fax: + 381-11-361-7582
Zorica.Mihajlovic@mail.doc.gov

Contact Information: Serbia

Serbian Ministry of Transport and Telecommunications
Ms. Marija Raseta-Vukosavljvic, Minister
Mr. Andrija Bednarik, Assistant Minister
Address: Nemanjina 22
11000 Belgrade
Tel: +381 11 3616 273
Fax: +381 11 3616 273
E-mail: info@msotel.sr.gov.yu
Web site: www.msaotel.sr.go.v.yu

Telecom Serbia
Mr. Drasko Petrovic, General Manager
Address: Takovska 2
11000 Belgrade
Tel: +381 11 3616 273

Fax: +381 11 3616 273
E-mail: mjojic@ptt.yu
Web site: www.ptt.yu

Contact Information: Montenegro

Agency for Telecommunications
Mr. Zoran Sekulic, Director
Address: Bulevar Revolucije br 1.
81000 Podgorica
Tel: +381 81 241 786
Fax: +381 81 241 805
E-mail: agentel@cg.yu
Web site: www.agentel.cg.yu
TELEKOM CRNE GORE, A.D.
Mr. Oleg Obradovic, General Manager
Address: Braće Zlatičanina 2
81000 Podgorica
Montenegro
Tel: +381 81 432-400
Fax. sekretar@telekomcg.com
E-mail: office@telekomcg.com

Ministarstvo ekonomije
Mr. Darko Uskokovic, Minister
Address: Cetinjski put bb, PC "Vektra"
81000 Podgorica
Tel: +381 81/482-157 234 012
Fax: +381 81/242-028
E-mail: aleksb@mn.yu; bogdanovic@cg.yu

Slovakia

Telecom

Market Players

Hard Line Operators:

Slovak Telecom (ST) www.telecom.sk is the major provider of hard line telecommunications services in the Slovak Republic. ST owns and operates a nationwide telecommunications network, and provides local, national and international telephone services, leased line services, data network services, telex and telegraph services, distribution and broadcasting of radio and television signals and other telecommunication services.

Pursuant to the Slovak government resolution of July 2000, the strategic investor Deutsche Telecom acquired 51 % stake in ST. Besides professional managerial and technical know-how enabling increase of performance in competitive environment, the strategic partner also provides access to global information markets.

Mobile Operators:

Since 1997, open competition helped the mobile phone sector become the most dynamic growth sector in the Slovak telecommunications market.

There are two GSM 1800 MHz cellular operators, Eurotel a.s. www.eurotel.sk and Orange a.s. www.orange.sk. Slovak Telecom owns 60 percent of Eurotel a.s. with the remaining 40 percent is owned by Atlantic West B.V. Orange a.s. has a more diverse ownership with 64 percent held by France Telecom Mobiles International and the remaining portion held by six Slovak enterprises and the European Bank for Reconstruction and Development (EBRD.)

In 2002, Eurotel a.s. provided services to 1,298,462 clients and Orange a.s. served 1,713,370 clients. In December of 2002, Slovak cellular networks reached around 54.35 percent, roughly 3,011,832 users. The total estimated turnover for the mobile telecommunications market was $ 501.5 million in 2002 and the industry predicts that this figure will triple in four years.

Mobile communications will change drastically, following the trends in the rest of Europe. We can expect development of mobile Internet services based on the Wireless Application Protocol (WAP), and implementation and supply of General Packet Radio Service (GPRS) followed by EDGE technology. The Slovak Government has sold three Universal Mobile Telephone Service (UMTS) that will significantly increase the range of mobile communication services. (In some countries, UMTS is known as International Mobile Services, or IMS 2000.)

Government Role
In 1998, the Slovak government liberalized all telecommunication services except the public voice monopoly, which was not liberalized until December 31, 2002.

On May 19, 2000, the Slovak Parliament approved a new telecommunications law that began since July 1, 2000. This law lists the general conditions for the operation of the telecommunications networks, accessibility of universal service and the creation of a competitive environment in telecom services. In 2002, total expenditures on telecommunication services amounted to $418 million.

Even though Slovakia is currently getting used to liberalization, we feel the liberalization process is creating major business opportunities for American telecommunications service providers. Slovakia's liberalization of increased services has increased the number of clients generating an even greater demand for services. The strongest growth has been in mobile, data communications and Internet services which we expect to increase when the public voice telephones is liberalized in 2003 - 2004.

Broadband
DSL
High Speed Internet Access is already a reality in certain regions of Slovakia. The main telecommunication operator ST and eight alternate operators launched DSL service on June 2003, and offers high-speed services through the Asymmetric Digital Subscriber Line (ADSL).

Future prospects
U.S. companies have already succeeded in the market with mobile services, and we feel there is still potential in these services such as pre-paid cards or wi-fi services. We also feel there are opportunities for alternate hard line operators and other new services such as call centers, homework services, and tele-education and distance learning services. For more information please contact Marian Volent.

Hardware

Market Players
In 2002, computer hardware sales in Slovakia represented USD 283 million, office equipment sales were USD 30 million, datacom and network equipment reached USD 423 million, and IT services were USD 197 million. A number of local firms are already making the transition to more value-added services, such as networking and solution development. U.S. companies represent approximately 40 percent of the total hardware market, Germany represents 15 percent, and local production represents approximately 10 percent of the market. The key US companies are IBM, HP/Compaq, DELL and Apple. In 1998,ON Semiconductor, formerly a division of Motorola, bought the state owned company Tesla Piestany, and established a company that produces semiconductors which employs 500 workers.

The largest company currently assembling computers in Slovakia is a French/Slovak company registered by the name Bull, while Sony-Slovakia produces and assembles monitors.

Technology In Use
There is growing demand for portable computers, handheld and PDAs. U.S. companies have been successful in exporting telecommunications equipment such as ATMs, routers, bridges, PABXs, structured capacity cable systems, encryption technologies for data and voice transmission, ISDN cards, data Multiplexors, mobile phones and equipment for satellite communication.

Market Driving Forces
The development of Slovakia's Hardware market reflects spending from the banking, financial service institutions and public sector. Growth from the implementation, networking and hardware maintenance continues with the main end-users of hardware equipment coming from the financial sectors such as banks, insurance companies, government ministries, and from Parliament and state administrations. Local industries such as automotive producers, engineering companies, energy production and distribution companies are also contributing to the growth.

Future Prospects/Opportunities
Server systems
Work stations and personal computers
NT and UNIX servers
Data communications equipment
Packet switching & routing equipment
PBX
Key systems and circuit switching equipment
Data com and network equipment
Switched data and leased line services

Software

Market Players
While the Slovak ICT market is hardware-oriented, demand for software services has risen since 2000. The hardware market is currently saturated, particularly in key sectors. A number of local firms are making the transition to more value-added services, such as networking and solution development. In 2003, software sales represented USD 136 million. The biggest local software companies are Asset Soft, PosAm, Novitech and Logica Slovakia. The leading company is France's Alcatel.

Market Driving Forces
Growth from implementation and software maintenance continues with the main end-users of hardware equipment coming from the financial sectors such as banks, insurance companies, government ministries, and from parliament and state administrations.

Local industries such as automotive producers, engineering companies, energy production and distribution companies are important software services users. Growth continues with distribution networks, retail chains and food markets, alternate telecommunications and data transmission service providers.

Many Slovak companies are resisting change and aren't investing in modern solutions. Customer service is not included in business development plans for a many Slovak companies. Nevertheless, the Slovak software market continues to increase its share of the overall ICT spending.

Future Prospects/Opportunities
System and application software
Customized software
Client-oriented multi-currency banking information system
Software for electronic distribution channels providing all basic retail functions
Complex information system for card services
Decision-supporting information systems
Information system for management staff
Complex information system for insurance companies
Complex insurance information system for health insurance companies

Contact Information:

Marian Volent
Senior Commercial Specialist
U.S. Embassy - FCS
Panska 14, P.O. Box 309
814 99 Bratislava 1, Slovak Republic
Tel: + 421-2-5920-5318
Fax: + 421-2-5920-5333
Marian.Volent@mail.doc.gov

Slovenia

Market overview

The telecommunication market in Slovenia, totaling 615 mil EUR in 2002, is of middle size among EU. Market growth of 8%, was driven by the mobile segment which represents a 52% share. Mobile penetration in Slovenia is the second highest among EU (83% as of 30 June 2003). The fixed segment is relatively stable (this is represented by 51 % inhabitant penetration and an increasing household penetration – 85% the end of 2001 and 96% as of June 2003). The usage of advanced technologies (ISDN, ADSL) is widespread in Slovenia (65% of business lines and 20 % of residential lines are ISDN-based, which is by far the highest ratio among EUCCs). The fixed voice telephony amounts to about 41% of the total telecommunication market. The telecommunication market in Slovenia has been liberalized since mid 2001 but no alternative fixed operator is operating in the country. Telecom Slovenia (TS) is facing competition only in the market of international calls where 12 alternative (VoIP) operators are present throughout the market.

Government Role

The Ministry for Information Society, established two years ago, is responsible for all aspects of information technology, telecommunications and postal services. The Ministry has put a strong emphasis on the construction of public switched telecommunication network (PSTN) and on the introduction of state-of-the-art techniques and technologies. Its final goals are to install the latest technology, apply state-of-the-art techniques of data processing and transmission, and introduce new services in both fixed and mobile telecommunication networks.

The Telecommunication Act, adopted in 2001, has enabled the opening of a relatively closed telecommunication market in Slovenia to all kinds of telecommunication services. The act defines the application of telecommunication networks, radio stations, telecommunication equipment and the management of the radio frequency spectrum.

The Slovenian Telecommunications, Broadcasting and Post Agency (ATRP) was established in 2001, and is financed through fees for numbering, radio frequencies, and licenses. Its responsibilities includes licenses, notifications, interconnection, local access, rights of way, tariffs, and numbering. ATRP has 65 employees (17 of them handling directly the telecommunications regulatory tasks).

Licensing in Slovenia is defined as notification for the operation of public network and provision of network services. Licenses are required for fixed public telephone services, broadcasting services or mobile public radio services on a self-operated network. For notification there is only a fixed one-off fee of 361 EUR, and there are annual fees for licensees (108,190 EUR for SMP operator and 72,127 EUR for other operators). It is necessary to obtain a license prior to launching telecommunication services. As of 30 June 2003, the fixed incumbent is the sole licensee for fixed public telephony providing service; two other operators have licenses but they do not yet provide service.

Slovenia is one of EU member states where UMTS license has already been assigned to Mobitel.
Slovenia ranks very close to the current 15 EU members ratio of personal computers per 100 inhabitants. It is ahead of Portugal, Italy, Greece and Spain. For Internet use, Slovenia ranks close to the EU 15 average. Along with Estonia it is ahead of the other candidate countries as well as six current EU members. However, it lags by 2-3 years behind Scandinavian countries and USA in internet usage. With respect to Internet host per 100 inhabitants, Slovenia in 2001 reached 42% of the EU average. Slovenia is ahead of the EU for the number of mobile phone subscribers.

Ownership structure
67% of the fixed incumbent operator is owned by the state (62,53 % Republic of Slovenia and National Property Fund 4,25 %) and the remaining 33,5% shares are publicly owned. The largest mobile operator (Mobitel) is a fully owned subsidiary of Telekom Slovenia. The second largest, Simobil, is 75% owned by Mobilkom Group of Austria. The smallest one, Debitel, mobile operator has private owners.

Wireless communications
Mobile services in Slovenia are among the most developed; three licenses for DCS and two for GSM networks ensure good competition. The penetration rate is the second highest among EU candidate countries and still is growing rapidly (83% as of 30 June 2003 in comparison with 70% previously). The two largest biggest operators provide GPRS services. There are 77,510 GPRS users as of 30 June 2003, which is about 4,67% of all mobile subscribers. 3G services are currently available and provided by Mobitel.

Slovenia is very well developed in terms of high Internet penetration (45%, the highest among EU candidate countries), household Internet access penetration (38%), number of ISPs and number of hosts per inhabitant (20 hosts per 1000 inhabitants). Cost for dial-up Internet access is high for residential users since ISP charges are above the EU maximum, but ADSL technology is relatively inexpensive.

Contact Information:

Marko Mlakar
Commercial Specialist
U.S. Embassy - FCS
Presernova 31
1000 Ljubljana, Slovenia
Tel: + 386-1-200-55-28
Fax: + 386-1-200-55-29
Marko.Mlakar@mail.doc.gov

Dr. Pavel Gantar
Minister
Ministry for Information Society
Trzaska cesta 21, 1000 Ljubljana
Slovenia
Tel: 386-1-4788347
Fax: 386-1-4788348

Nikolaj Simic
Director
Telecommunications, Broadcasting and Post Agency
Kotnikova 19a, 1000 Ljubljana
Slovenia
Tel: 386-1-4734900
Fax: 386-1-4328036

Peter Grasek
President of the Board
Telekom Slovenia d.d.
Cigaletova 15, 1000 Ljubljana
Slovenia
Tel: 386-1-2341200
Mail: info@telekom.si

Dremelj Bojan
Chairman of the Board
SIMOBIL d.d.
Šmartinska cesta 134B, 1000 Ljubljana
Slovenia
Tel: 386-1-544 00 00
Fax: 386-1-544 00 99
http://www.simobil.si

Julien Costaury, General Manager
WESTERN WIRELESS INTERNATIONAL d.o.o.
Brnciceva ulica 49, 1231 Ljubljana - Crnuce
Slovenia
Tel: 386-1-580 10 00
Fax: 386-1- 580 10 09
Director: Julien Coustaury
http://www.vega070.com

Spain

Telecom

Spain has the fifth largest market for telecommunications equipment and services in the European Union, with an approximate value of USD 23 billion in 2002. The market for telecommunications services continues to grow, but at a decelerating rate. Mobile Telephony and Broadband development have been the key areas of growth.

Market players / market overview
Telefonica Group is the dominant player in all market segments, but there will be increased pressure on the company to provide breathing space to other carriers.

In fixed telephony, Telefonica is the dominant player, but competitors have been able to achieve a 16 percent of market-share. Retevision and Lince (Uni2) are the runner-ups. Additionally, more than 70 companies were licensed fixed-telecom service providers in 2002. There are over 17.5 million lines in service directed to end-users, and market penetration is estimated at 42 lines per 100 inhabitants.

Table 1: Revenue by telecom operators *(All figures in USD millions)*

	2001	2002	2003*
Fixed telephony	7,779	8,054	9,460
Mobile communications	8,656	10,550	13,335
Broadcast operators	3,457	3,640	4,445
Other operators	709	851	1,185
TOTAL	20,602	23,095	28,425
Exchange Rate $1:	1.1171	1.0578	0.8774

** Exchange rates applied for future periods.*
**The above statistics are unofficial estimates.*

Three companies control the Spanish wireless market. GSM and GPRS services are available, and infrastructure for UMTS is in place. The major cellular operator in Spain is Telefonica's GSM service Movistar with 18.7 million subscribers. Vodafone has 9.1 million subscribers and Amena (part of the Auna group) has reached 6.8 million clients. The three operators combined have 34.6 million users. A new development in this area has been the recent opening of the market to Mobile Virtual Network Operators (MVNO). As well, I-mode has been launched in Spain.

In 2000, the Ministry of Science and Technology granted six licenses to provide access via WLL technology. After mergers and restructuring, five companies are now active in the market servicing an estimated two thousand business clients.

More than 1,150,000 clients are currently connected to ADSL services in Spain, a growth fueled by strong investment from Telefonica and other companies. This strategy is expected to reach 1,500,000 clients by year-end 2003.

There are two main cable companies in the market, the Ono Group and Auna Telecomunicaciones. Together they have over 500,000 residential clients. Wi-Fi is growing steadily and is expected that the Spanish Government will increase the spectrum available for this technology in the near future.

Government Role
Many opportunities for U.S. telecommunications exports and investment in Spain result from the liberalization of the Spanish regulatory regime for telecommunications services. To safeguard competition in the sector, the government established the Comisión del Mercado de las Telecomunicaciones (the Telecommunications Market Commission) in 1997. The CMT is the principal telecommunications regulatory authority in Spain, but the Spanish Ministry of Science and Technology has its own powers for regulation of the telecommunications sector, such as frequency allocation, spectrum management, regulatory policy for rights of way and planning of telephone number allocation.

The Spanish Government recently announced as well plans to approve in 2003 a new telecommunications law that will significantly change current legislation governing the telecom sector. The stated purpose of the law is to reduce the intervention of the public administration on market initiatives and thereby facilitate the launching of new companies.

Future Prospects/Opportunities
There is perception in the market of growing investment by the service providers. Expected areas of growth are: software and solutions that will provide content to broadband services for customers, mobility devices both for businesses and consumers, TV over ADSL, Wi-Fi expansion and CATV.

Hardware

The Market
The total market for Information Technology (IT), which includes hardware, software, services, supplies and value added services, was estimated at USD 10.8 billion for 2002. This was a 0.4 percent decrease over 2001, however the level for 2003 and indications for 2004 show positive growth trends (2.8 percent and 5 percent respectively). The Spanish IT market represents 5 percent of the whole European market and 1.75 percent of the Spanish GDP. The Spanish IT industry still maintains its potential and significant opportunities for U.S. companies. The U.S. is the source of 20 percent of total imports of computer and peripherals.

The market for computer hardware represents 34 percent of the whole IT market in Spain, growing to USD 3.72 billion in 2002, and showing a small dollar increase over

2001 (network equipment is not included). Of the total hardware market, microcomputers (PCs, laptops and desktops) accounted for 53 percent of the market, server systems represented 25 percent, printing systems represented 15 percent, and other peripherals the remaining 7 percent.

While sales of portable devices are increasing substantially (an expected 74% increase in 2003), sales of desktops are limited to 12 % increase in the same year.

Data (All figures in USD millions)

	2001*	**2002***	**2003 ****
A. Total Market Size	3,707	3,720	4,472
B. Local Production	2,306	2,326	2,785
C. Total Exports	909	926	1,094
D. Total Imports	2,310	2,321	2,781
E. Imports from US	485	488	584
Exchange Rate USD1: Euro	1.1171	1.0578	0.8774

(The above statistics are based on EITO, European Information Technology Observatory figures and industry sources).

* 2001/2002 rate =actual exchange rate
** 2003 rate = assumed exchange rate

Market Players
Although the leaders of the market are U.S. firms (HP, Dell and IBM), 25 percent of the computers installed in Spain are locally assembled clones. Sixty percent of the hardware market and 50 percent of the software products are imported.
Although official statistics indicate that 82 percent of IT products come from other European countries and only a low percentage comes from the U.S., most of the imported computer hardware is either sourced from the U.S. or manufactured locally by U.S. subsidiaries.

The number of IT firms owned by Spanish capital is approximately 30 percent, obviously concentrated in small and medium firms. Foreign investment comes primarily from the U.S. (30 percent of the total), Germany (15 percent), Japan (12 percent) and the U.K. (5 percent).

According to recent figures by IDC, market shares of the top five manufacturers in the hardware market for the year 2003 are:

Market shares for the total market of PCs, laptops and servers:
HP 19.2 %; Acer 10.3 %; Dell 8.6 %; Airis (local firm) 6.5 %; Fujitsu Siemens 4.5 %

Market shares for desktops:
HP 18.4 %; Dell: 10.3 %; Fujitsu Siemens 5 %; Cofiman (local): 4.8 %; IBM: 4.8 %

Market shares for laptops:
Acer 25.1 %; HP 18.6 %; Airis (local) 11.2 %; Toshiba 11.2 %; Dell 4.8 %

Market shares for servers:
HP 48.1 %; Dell 17.6 %; IBM 17.4 %; Fujitsu Siemens 8.93 % Investronica (local) 1.6 %

Future prospects / Opportunities
Best prospects are found in servers and portable equipment for SMEs, new requirements for E-commerce, business integration and consulting and implementation services. Another area is all peripherals and hardware with wireless applications and wifi.

Best opportunities are found in the business/industry segment, primarily in workstations and servers for small and medium sized industries (HS 8471). The home sector is also expected to experience large growth thanks to the impressive development of the Internet and the market for CD-ROM readers for private use (HS 8471), modems (HS 8517), and multimedia PCs (HS 8471). There are also good opportunities in other segments such as laser printers, plotters, laptops and Palm-PCs (HS 8471).

Market access for U.S. firms
Commercial Service Spain offers a wide range of products and services for U.S. companies seeking business partners in Spain. These services include up-to-date market information, assessment of a U.S. firm's product sales potential, identification of potential representatives, individual counseling, trade missions, setting up appointments with screened firms, etc.

For additional information on the products and services provided by CS Spain, we invite you to contact our website www.buyusa.gov/spain.

Software

The Market
The total market in Spain for Information Technology (IT) includes hardware, software and services, and represents 5 percent of the total European market and 1.75 percent of the Spanish GDP. The Spanish IT market had an estimated value of USD 10.8 billion for 2002 and is now going through a period of lower growth rates and even negative figures in some of the sub sectors. Although the overall information technology sector was nearly flat in 2002, the projected levels for 2003 and 2004 show again positive growth trends (2.8 percent and 5 percent respectively). The Spanish IT industry still maintains its strength, potential and significant opportunities for U.S. companies.

The specific market for computer software represented 16 percent of the total Spanish IT market, with a 0.4 percent increase in 2002, for a total of USD 1.75 billion, of which system software represented 51 percent and application software 49 percent. In system software, best prospects are found in software for databases, operative systems, and

software for communications, while in applications multimedia software and vertical applications show the best potential. Spain has a relatively high level of software piracy but its enforcement is improving.

The software market in Spain is very closely connected to services, especially in software development and custom-tailored installations. The market for computer services was estimated at 4.26 billion Euros for 2002 (USD 4.03 billion), a 2.8 percent increase over 2001, following an 8.6 percent increase in 2001 over the previous year. In the services market, larger increases were concentrated in consulting services (with an increase of 2.1 percent in 2002), and software implementation (which increased by 2.1 percent in 2002, to USD 1.73 billion). Although the IT services market offers good potential, local firms, or foreign subsidiaries located in the local marketplace, provided most of the services. Industry estimates indicate that foreign firms (import of services) directly provided only 7 percent of the IT services.

Data (All figures in USD millions)

	2001*	**2002***	**2003****
A. Total Market Size	1,661	1,762	2,198
B. Local Production	1,240	1,231	1,557
C. Total Exports	280	339	407
D. Total Imports	701	870	1,048
E. Imports from US	147	183	220
Exchange Rate USD 1: Euro	1.1171	1.0578	0.8774

(The above statistics are based on EITO, European Information Technology Observatory figures and industry sources).
* 2001/2002 rate =actual exchange rate
** 2003 rate = assumed exchange rate

Market Players
Although imports in the IT sector are mainly concentrated in hardware, imported software represents 48 percent of total sales in the software market. Computer software represents a small proportion of foreign trade figures in the sector (only 15 percent of imports and 17 percent of exports). Although 80 percent of IT products and services come from other European countries and only 7 percent from the U.S., the majority of the imported computer software either comes from the U.S. or from an European country through a U.S. subsidiary.

Future Prospects / Opportunities
Best opportunities are found in the business/industry segment, primarily in software business applications, database software and sectorial packages. In the household

market, there is also good potential for software associated with increased use of Internet and multimedia PCs.

As of January 1, 2000, under the Information Technology Agreement (to which the EU is a signatory), the EU tariff on computer equipment is zero (HS code used is HS 85.24).

Market access for U.S. firms
Commercial Service Spain offers a wide range of products and services for U.S. companies seeking business partners in Spain. These services include up-to-date market information, assessment of a U.S. firm's product sales potential, identification of potential representatives, individual counseling, trade missions, setting up appointments with screened firms, etc.

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Contact information:

Emilio Arranz
ICT Trade Specialist (Hardware, Software)
American Consulate General
Paseo Reina Elisenda, 23
08034 Barcelona, Spain
Tel: 34- 93-280 2227, ext. 289
Fax: 34- 93-205 7705
emilio.arranz@mail.doc.gov

Jesus Garcia
ICT Trade Specialist (Telecom. & E-Commerce)
American Embassy – FCS
Serrano 75
28006 Madrid, Spain
Tel: 34-91-564 8976, ext. 2619
Fax: 34-91-563 0859
Jesus.Garcia@mail.doc.gov

Sweden

Telecom

The Swedish telecommunications market has been liberalized since 1993 when Televerket (the Swedish incumbent) lost its de-facto monopoly status. Through a various reforms, competition has since increased gradually in the Swedish market. The goal for Sweden's telecom policy is that everyone throughout Sweden should have access to effective telecommunications. Telecommunications services should be fairly distributed regionally within the country, should be open and flexible and also contribute to the efficient use of resources in the society. A new electronic communication act came into effect on July 25, 2003, which comprises all types of electronic communications, i.e. telecommunications, cable TV and the Internet. More information on the act can be found at www.pts.se.

The Swedish government plans to spend around USD 890 million in infrastructure development during the next four years, providing that equal share matching commercial investors can be found. The goal is to provide consumers and corporate users in all parts of Sweden with broad band connections by 2005. The market will handle the expansion of the infrastructure while the government takes overall responsibility for completion of the goals through budget and policy means.

The high level of IT maturity and easy entry into the market have attracted a broad spectrum of players, including multinational telecom operators, computer companies, systems integrators and niche companies. The largest investments last year were in networks, switches and other equipment for fixed line telecom traffic representing 51% of total investments while the equivalent figure for mobile equipment was 42%. Total investments in network management were USD 1.4 billion. Almost 72% of the investments went toward 3G expansion.

Market Players

There are five major networks throughout Sweden; TeliaSonera, the National Rail Administration, the Swedish National Grid, Teracom, and Song Networks. In addition there are several regional networks, which are mostly owned by energy companies and municipalities. TeliaSonera is the largest provider of fixed telephony with a 41% market share in the national call segment, Tele2 is the second largest with 18%, other service providers are Telenordia, ACN and Song. TeliaSonera is dominant in the international call segment as well, with 57% of the market followed by Tele2 (14%) and MCI (10%). TeliaSonera is Sweden's largest GSM operator with around 45% of the market, followed by Tele2 (38%) and Vodafone (15%). There are also several service providers that buy capacity and serve customers under their own brands. In December 2000, the Swedish regulator PTS issued licenses for 3G services to four companies; Tele2, 3, Vodafone, and Orange (Orange has since given its license back). At year end 2002, 89% of the Swedish population had mobile subscriptions. Penetration has increased steadily between 1998 and 2002. During this time, subscriptions for mobile services have doubled.

Prepaid subscriptions have quadrupled during 1998 to 2002 and accounted for 54% of all subscriptions in 2002. The market for GPRS services has not taken off in Sweden. GPRS is available wherever there is a GSM network. Almost 2 million users have access to GPRS via their phones, but only around 100,000 use it. Use of W-LAN (WiFi) is expanding in Sweden. The largest operator, Telia Homerun, has more than 15,000 hotspots throughout the country. Only one company has introduced 3G services in Sweden. The company, called 3, launched its services on May 5, 2003. Demand was not very high in the beginning as both service as well as phones were considered too expensive by consumers. The other two license holders, Tele2 and Vodafone, have not stated exactly when they will roll out services.

Internet

Internet penetration in Sweden is very high. In the age group 15 to 75, 69% have access to the Internet at home and 35% have access through broadband. By the end of 2003 and beginning of 2004 it is forecast that broadband connections will outnumber dial-up access, which will mean that more than 30% of Sweden's households will be online all the time. ADSL is the dominating form of broadband access with 21% of the market. Others are CaTV (6%) and Ethernet-LAN (8%). TeliaSonera is the dominant ISP with 36% of the market, followed by Tele2 (26%), Telenordia (10%) and Spray (9%) for dial-up access. For broadband access, the dominant players are TeliaSonera (55%), Bredbandsbolaget (13%) and Bostream (9%) and UPC (8%). Altogether, there are some 100 ISPs throughout Sweden.

Future Prospects/Opportunities

The wireless market will continue to grow in Sweden. Users will migrate from GSM to 3G services when full services are rolled out and offerings are more attractive in terms of price and content. Broadband will continue to grow strongly as prices for access drop and the infrastructure expands. Competition will increase when the number of operator-neutral networks increase in multi-family dwellings. Users will be looking for new applications in this segment. LLUB is still an issue in Sweden, therefore, IP telephony will see stronger growth as the broadband market continues to spread among users. Wireless broadband is another area where growth is expected, as mobility will be key for users.

Hardware

Market Players

Sweden is one of the most computerized countries in the world. Around 9% of GDP is invested in ICT and as many as 71% of the Swedish population between the ages of 7 and 79 have PCs at home. The Swedish hardware market experienced negative growth in 2002 (-3.9%) and the same is expected for 2003 while 2004 is forecast to show growth around 3% to reach a value of around USD 4.3 billion. The mid-range server market is expected to show substantial growth (10%) while the workstation market may see a steep decline around 10%. In the PC segment, the laptop market is forecast to grow by 8% while the desktop market sill see a slight downturn. E-commerce will continue to grow.

In 2003, Swedes shopped online for around USD 1 billion, which represents 2% of total retail sales. B2B commerce is expected to double in 2004.. Swedes will continue to buy new computers that can download music, films, etc. New products will be launched on the market; tablet PCs, MP3 players, etc. All major U.S. supplier are active and successful in the market. HP dominates currently, followed by Dell, Fujitsu Siemens and IBM.

Government Role

According to the 2003 IDC global survey Sweden tops the list as the nation with the best government policy leadership in information technology development. As much as 9.3% of GDP is invested in IT. In March 2000, the Swedish government presented a new basis for its IT policy, laid out in an IT bill. The government will spend around USD 890 million in infrastructure development with the provision that commercial interests invest an equal amount. The goal is that consumers and corporate users in all parts of Sweden during the next few years have access to an IT network with high-speed connections. The market will handle the expansion of the infrastructure while the government takes overall responsibility. The Swedish government has assigned the Swedish Post and Telecom Agency (PTS) the task of following up the expansion of infrastructure in collaboration with the Swedish Business Development Agency (NUTEK). The Ministry of Industry, Employment and Communications recently presented the government's continued efforts to advance IT in Sweden. An IT policy group has been established that will function as an advisory board to the government and to be a driving force to reach the goal that Sweden be an information society for all. The government has also established an IT commission that will be responsible for the development for the "24/7 agency" and public e-services. The goal is to have all principal government agencies available online for forms and information around the clock. The new commission will include representatives from government, municipalities, county councils, academia and the business community. The policy group and the commission will be active until November 1, 2006.

Technology in Use

The Swedish market is a Windows-based society using an increasing number of Web-based solutions via high speed communications infrastructure.

Market Driving Forces

Internet penetration in Sweden is very high. In the age group 15 to 75, 69% have access to the Internet at home, 35% of those have access through broadband. By early 2004 broadband Internet connections will outnumber dial-up access and more than 30% of Swedish households will be online all the time. More users will be able to take advantage of a wider selection of services online. Most large Swedish multinational companies are heavily involved in B2B on the Internet, seeking new tools for communications and transactions, which will serve as a heavy market driver. Industrial users, the public sector as well the consumer market are also driving forces for the development of the Swedish IT market.

Future Prospects/Opportunities
The Swedish market will continue to look for for high quality technology solutions. U.S. suppliers are very successful in the Swedish market, and with Sweden's IT maturity, there will continue to be opportunities for U.S. companies that offer the latest technology.

Software

Market Players
Swedish users are early adopters of new technology, which makes Sweden a great test market for new IT products. Swedish industry, with its small domestic market, has recognized the importance of utilizing the newest technologies in order to be able to compete successfully on the international scene. A number of U.S. companies have set up research centers in Sweden as a result of the country's prominent position as an IT nation. The Swedish software market grew marginally in 2002. It is estimated that growth was around 3% in 2003. In 2004, it is forecast that growth will be around 4% to reach a value of USD 3.2 billion. The drivers behind the growth in the application software segment include CRM that support sales, marketing and customers services; adoption of supply chain automation, continued globalization of business, wireless applications and e-business. There are around 1,200 software companies in Sweden that are primarily focused on the market for enterprise resources, data security and encryption software as well as wireless applications. Security solutions will continue to be in demand, as will software for customer relationship management, supply chain management, analytics as well as mobile applications. All major U.S. software suppliers are active in the Swedish market and U.S. products are considered to be of high quality and reliable, which makes Sweden an excellent market for U.S. products. Swedish software companies are successful in business applications, security solutions, and communications systems and applications. The largest players in the market are Microsoft, SAP, Oracle, Ascom Tateco and Agilent Technologies.

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Technology in Use
The Swedish market is a Windows-based society using an increasing number of Web-based solutions via high speed communications infrastructure.

Market Driving Forces
The delivery of software applications will change over time. Web services, managed IT and hosted applications will shape the software market in the future as the industry on a larger scale migrates to Web-based applications. Industrial users, the public sector as well as the consumer market are also driving forces for the development of the Swedish IT market.

Future Prospects/Opportunities
U.S. exporters of software enjoy a very good reputation on the Swedish market. Suppliers of high quality state-of-the-art solutions will have good opportunities in the market.

Contact Information

Gunilla LaRoche
Commercial Specialist
U.S. Embassy – FCS
Dag Hammarskjolds vag 31
SE-115 89 Stockholm, Sweden
Tel: +46 8 783 5353
Fax: +46 8 660 9181
Glaroche@mail.doc.gov

Switzerland

Telecom

If Switzerland were in the European Union, its $8 billion-plus telecommunications market (2002) would rank 7th in size, on a par with Sweden, Belgium/Luxemburg, and Austria. Fixed-line services make up 52% of the market size, mobile over one-third, cable TV 9% while data and messaging services account for the remaining 6%. The telecommunications equipment and services market in 2002 grew by a mere 1.0% however some industry analysts forecast a light recovery for 2003. Mobile services and broadband Internet access continue to drive the market, though most investment is in voice.

E-commerce is riding the tide of ever-greater broadband penetration. In 2002, e-commerce web server sales were up by 13% and Switzerland trailed only the U.S. and Canada in the number of secure web servers per 100 inhabitants (22). B2C e-commerce should generate nearly $4 billion in 2003, or some 7% of total retail sales. The country's German-speaking region (70% of Switzerland's total population) alone counts 2.3 million Internet users, over 60% of whom have been shopping online. Despite a slight drop in the number of companies procuring online, the total value of B2B e-commerce in 2002 grew by 77%, to some $16 billion. Swiss companies use online procurement to accelerate and streamline business processes and to optimize their supply chain and internal processes.

Market Players

The major telecommunications service providers in Switzerland are Swisscom (the incumbent), TDC Switzerland (sunrise), and Orange Communications. The former two offer both wire-line and wireless services, while Orange is strictly a mobile operator. The field comprises some 360 service providers, of which four-fifths are fixed-line operators. The Swiss market is very open to foreign providers; in addition to TDC and Orange, non-Swiss providers dominate the country's top ten list, including Tele2 and Colt but also two U.S. companies, MCI and AT&T. Colt and MCI own and operate extensive fiber backbones and networks; T-Systems sold their network to domestic B-Com. Cablecom, owned by UK-based NTL and the country's largest and only nationwide cable TV and broadband Internet provider, has been publicly testing Internet telephony services since March 2003; other (regional) cable operators are also pursuing this market.

Government Role

The Federal Office of Communication, Bakom, is the executive agency for telecommunications and broadcasting (radio and television) and prepares the decisions of the Swiss government, including the Swiss Federal Communications Commission (ComCom). Bakom prepares the commercial transactions of ComCom, makes the necessary applications and carries out its decisions. In the telecommunications sector, Bakom licenses all providers of fixed network services, without a tender procedure. Licenses are required for service providers who operate their own network infrastructure in Switzerland, but not for those who operate exclusively via interconnection.

By contrast, ComCom awards the basic provision license and licenses for the provision of mobile telephone and other radio services based on invitations to tender. It also rules on interconnection disputes and approves frequency and numbering plans.

Switzerland's telecommunications market saw partial deregulation in 1998 and has since enjoyed competitive prices and service, especially in the wire-line segment. However, the local loop has remained in the hands of the incumbent, effectively leaving Swisscom in control of pricing and technology. Striving to level the playing field for all operators, the Swiss federal government in April 2003 decreed full unbundling and, in parallel, submitted a draft revision of the Swiss telecommunications law to parliament to include the unbundled "Last Mile" in the new interconnection regime. However, Swisscom has been legally contesting full unbundling ("full access") of the local loop, which its present and future competitors are now unlikely to see before 2005 or 2007.

The Swiss government is committed to promoting school access to the Internet and the "Internet society" in general, voting via the Internet and broadband Internet access.

Mobile Communications

Switzerland's three GSM (900 and 1800 MHz) network operators are Swisscom Mobile, TDC Switzerland (sunrise), and Orange Communication. In December 2002, they controlled 63%, 20%, and 17% of the market, respectively. A fourth provider, Tele2 offers its services as a Mobile Virtual Network Operator (MVNO) via Swisscom Mobile's network. The high average monthly revenue (ARPU) of over $50 is partly due to a smaller share of prepaid customers (40-42%), generally higher prices in Switzerland, and on average longer calls. Mobile subscriptions have outnumbered fixed lines since 2001, and SIM card statistics suggest that 79% of the population own a cell phone. Mobile telephony infrastructure since the end of 2001 has covered 80% of the terrain, and 99% of the population; Ericsson, Nokia, Siemens, Alcatel and Ascom are the main suppliers of infrastructure equipment.

Blaming lack of competition for the highest per-minute rates in Europe, ComCom tendered a fourth mobile operator's license and additional spectrum in July 2003, explicitly barring the existing providers. However, public resistance to additional mobile antennas is high and unlike in the EU, mobile licenses in Switzerland do not require existing providers to open up their networks to competitors and MVNOs.

Short Messaging Service (SMS) continues to lead the mobile data services segment, which has shown modest growth from 6% of total sales in 2000. Three billion messages were sent in 2001, more than half of all the connections made from mobile handsets, and more than 11 million short text messages are sent daily. Wireless Application Protocol (WAP) services were used 13 million times in 2001 and users spent 45 million minutes. General Packet Radio Service (GPRS, 2.5G) is offered by all three operators, while High-Speed Circuit Switched Data (HSCSD) service is available from Swisscom and Orange only. Multi Media Services (MMS), launched in October 2002, are driving the sale of camera handsets; users still pay four to five times the rates of SMS to exchange or download color photos and audio files, and to play online games.

Four third-generation (3G or Universal Mobile Telecommunications Services, UMTS) mobile licenses were auctioned in late 2000 at just over $31 million each, an average of $17 per user. One license is back on the market as its holder, 3G Mobile of Spain's Telefónica, withdrew in 2002. Swisscom, Orange and Sunrise plan to launch UMTS service in 2004. Until then, they will each invest over $666 million into their respective WCDMA-standard networks. Data traffic pricing should compare to today's MMS rates. With few UMTS handsets and applications available in 2003, ComCom has relaxed the original licensing requirements to 50% country coverage per network operator by year-end 2004. For the remaining coverage, compliant operators are then eligible for interconnection via competitors' networks.

Broadband

PC penetration at year-end 2002 was at 71 per 100 population (+4%), or over 5 million units; regular Internet use at 45%, or 2.56 million users. Former monopolist Swisscom still owns the last mile in fixed-line telecommunications, controlling pricing and technology for broadband Internet access via land phone lines. ADSL service is available to 95% of the country's 3.8 million subscribers (of a total population of 7.2 million), though only 20% of lines are digital. By year-end 2002, there were 195,000 ADSL and 260,000 cable Internet access subscriptions, totaling more than 12% growth over the previous year. ISP leader Bluewin (Swisscom) has cornered more than 55% of the market. For businesses, only a few ISPs offer fixed IP addresses. Since January 2003, Swisscom has been offering symmetric 512 Kbit/s broadband service, albeit via ADSL. Also since 2003, 1- and 2 Mbit/s connections have been limited to business customers for file upload and download, in-house VoIP telephony, and video conferencing. By contrast, 60% of home users are happy with 256 kbit/s, another 35% settle for 512 kbit/s. ADSL's fast rise puts the pressure on less widely available cable Internet access; NTL-owned Cablecom is the largest and only nationwide cable Internet provider in a market of 2.3 million potential users (among 2.7 million cable TV subscribers).

Swisscom's new Eurospot company launched Public Wireless Local Area Network (PWLAN) services in December 2002. Ranking fourth among PWLAN providers worldwide, Swisscom Eurospot by year-end 2003 will control a combined 1,000 hotspots in Europe, of which some 350 are in Switzerland. Sunrise very recently signed an agreement to cooperate with Monzoon, a local PWLAN provider, while Orange offers WLAN services for enterprises only. The profitability of PWLAN business models remains uncertain, whereas Wi-Fi networks are used more and more in private homes and businesses alike, though security awareness is often inadequate. The regulator has made additional frequency bands available in the 5 GHz range to accommodate growing demand and enable higher throughput.

Prospects/Opportunities

E-business, web services, broadband, mobile multimedia and location-based services are all expected to contribute to a light recovery in Switzerland's telecommunications market, along with networking security products and services. In general, Switzerland is a popular test market for U.S. companies who plan to enter Europe, and some 600 of them maintain country or regional offices here.

The country's leading financial services, pharmaceutical and other industries rely heavily on ubiquitous, fast, reliable and secure telecommunications services, as do hospitals as well as research and educational institutions. High labor costs and the constant need to increase productivity sustain a strong demand for new technologies; quality U.S. products are well-respected and many are local leaders in their market segments.

For more information on Switzerland's telecommunications market and opportunities for U.S. companies, please contact:

Hardware

Market Players
The largest market players are Hewlett-Packard, Sun Microsystems, Dell, EMC, Cisco Systems Borther, NCR, Fujistu Siemens, StorageTek and Panatronic. The total hardware market is estimated at $ 6,75 billion in 2003 and is expected to grow 1,5 to 2 % in 2004.

Government Role
There are no market restrictions enforced by the Swiss Government – aside from the exporting restrictions also applicable to U.S. exports. The Swiss Government is a major buyer of IT infrastructure, both, for its federal, state and local governments as well as the public school sector.

Technology In Use
Switzerland's market quickly invests in the latest available technology. High growth rates are being reported in the communication backbone infrastructure, mobile computing and WIFI equipment.

Market Driving Forces
Switzerland continues to be the number one address of U.S. companies establishing European or even worldwide headquarters. It is also home to many international organizations and some of the largest multinational companies. Their needs and the affluence of the general population is a major factor in continuing investments in IT technology.

Future Prospects/Opportunities
Main opportunities are for latest cutting edge technologies in all areas of communication and IT hardware.

Software

Market Players
The largest market players are SAP, Elca, Bedag Informatik AG, Oracle, Bison, Wilken, Microsoft, Abacus Research, Sunbay Software, Compuware and Simultan The total software market is estimated at $ 6,4 billion in 2003 and is expected to grow 1 % in 2004.

Government Role
There are no market restrictions enforced by the Swiss Government – aside from the exporting restrictions also applicable to U.S. exports. The Swiss Government is a major buyer of IT software and services, both, for its federal, state and local governments as well as the public school sector.

Technology In Use
Switzerland's market has high demands on latest software products and applications. Technology in use includes Grid, Java, Linux, Windows, Technology Network and AppsNet.

Market Driving Forces
The software requirements of a multinational business community and high end home and small office users dominate the demand for both, customized and standard software.

Future Prospects/Opportunities
Main opportunities remain in the areas of Customer Relationship Management (CRM), Finance and controlling, Enterprise Resource Planning, Supply Chain Management, Security, document management, content management, enterprise application integration, application service providing and e-procurement

Contact Information

Ernst (Aschi) Hegg
IT Programs Manager Europe
U.S. Embassy - FCS
Bern, Switzerland
Phone: +41 31 357 7343
Fax: +41 31 357 7336
GSM: +41 79 300 5554
Aschi.Hegg@mail.doc.gov

Turkey

Telecom

Market Players
In the Turkish Telecommunications Market, major players are Turk Telekom, Turkcell, Telsim, Aria and Aycell.

Government Role
An independent regulatory body under the name of Telecom Authority (www.tk.gov.tr) regulates the market and issues licenses for telecommunication services. Telecom Authority also approves telecommunications equipment to be imported into the country. Turkish Government has committed by law to fully liberalize the telecommunications services in 2004.

Infrastructure and Technology
Turk Telekom (www.telekom.gov.tr), as the incumbent fixed line operator, has over 19 million subscribers. It has a high digitalization rate (digitalization is 96 percent of its transmission lines). The fixed line density is approximately 29 percent. Turk Telekom has the only Internet backbone structure of Turkey named as TTnet. More than 50 private Internet service providers are using this backbone. Turk Telecom also owns three satellites and satellite earth stations. Major cities are connected with fiber optic networks and international connections are provided via submarine cables and satellite communication.

Wireless communications
The GSM cellular service providers, Turkcell, Telsim, Aria and Aycell each have a network expanding the whole country currently. Turkcell (www.turkcell.com.tr) currently has over 17 million subscribers. Telsim's subscriber estimate is approximately 8 million as of the end of 2002. Aria has approximately one million subscribers. Aycell's subscriber estimate is 400,000 as of the end of 2002. Turkcell and Telsim (www.telsim.com.tr) operate at 900 MHz GSM system. Aria (www.aria.com.tr) and Aycell (www.aycell.com.tr) operates at 1800 MHz GSM frequency. Aria and Aycell will soon merge. In addition, A Turkish company owns the mobile satellite communications company, Global Star.

Broadband
Any broadband fixed wireless (BFW) service operator has to have a license. Telecom Authority is currently developing license terms and conditions by also considering EU directives on these regulations. Telecom Authority will issue licenses for LMDS for the frequency band 24.5 to 26.5 GHz in 2003 or 2004. The frequency band 3.5 to 3.7 GHz has been assigned to the incumbent operator Turk Telekom, which uses this band to provide wireless telephony in rural areas. There is no special tariff for BFW interconnection.

However, all telecommunications operators are subject to the newly published access and interconnection ordinance, which makes all determined operators, be obliged to interconnect, based on cost-based charging.

Future Prospects/Opportunities
The liberalization of the Turkish telecommunications market in 2004 may force the market for the establishment of several other fiber optic networks as an alternative to Turk Telekom's network to provide traffic to the private sector. Best prospects will be voice and data transmission services through fiber optic networks and VoIP. High-speed data and leased line services have a promising future in Turkey. Over 40 private sector companies have already obtained a license. Additional opportunities also exist for the Turkish market in international traffic either originating or terminating in the country. Due to the widely dispersed Turkish population around the world, there is considerable amount of international calls being placed, primarily from Western Europe and the United States to Turkey. In addition, Turkey will play an important role in providing telecommunications traffic access to Iraq. Networks in Turkey can tie Iraq to the Internet world and participate in establishment of Internet backbones.

Hardware

The Turkish information technologies market is dominated by hardware sales. The market has experienced double-digit growth over the past five years except during 2001 when the economic crises affected IT purchases across the board. The following table provides an overview of hardware sales volume over the past five years.

Key players in the hardware market of Turkey are Beko, Vestel, Escort, Dell, Hewlett Packer, Compaq, Epson and Lenux.

Computer Hardware Sales Revenues 2001-2004

Year	Sales Revenue ('000 USD)	Percent Change
2001	995,538	-49.3
2002	1,435,970	44.2
2003	1,865,000	29.1.
2004 (est.)	2,424,000	30.0

Personal Computers and Notebooks
There are an estimated 750,000 personal computers and 50,000 notebooks sold annually in Turkey. Turkey's population of 65 million is relatively young, and given the current demographics of computer and Internet users, it is evident that the computer market is far from reaching the saturation level. With increasing Internet speeds, enhancements should boost PC sales further.

DVD Burners
DVD burners are far from reaching the expected market entry as expected previously in 2003. More so, USB 1.1, 2.0 and Firewire external data media are surprisingly preferred by the technical savvy Turkish consumer as well as the IT directors of corporations for backup and data storage.

Printer Cartridges
Turkey experienced a boom in sales of generic printer cartridges in 2002-2003. With HP ink jet printer cartridges selling at USD 30-40 retail; most consumers opted for the generic substitutes. The original ink cartridges coming mainly from the U.S. continue to be very costly and new startups have been active concentrating on generic refills.

Software

The major software suppliers to the Turkish market include companies like Microsoft, IBM, Oracle, SUN Microsystems, Business Solutions, Likom and Havelsan.

The following table provides an overview of software sales volume over the past five years.

Software Market Revenue 2001-2004

Year	Revenue ('000 USD)	Change (%)
2001	**270,940**	**-25.9**
2002	**423,215**	**56.2**
2003	**517,860**	**22.4**
2004	**672,000**	**30.0**

Technology
ADSL (Asymmetric Digital Subscriber Line) – the one million-subscriber breakthrough
ADSL's wide planned usage is to impact on the Turkish IT market as Internet speed grows 50 times, whereby the existing copper telephone lines are to be used allowing the shift to be quick and relatively hassle free. The latest project by the Ministry of Education is to connect at 40,000 schools throughout Turkey to the internet at a speeds of 512k using ADSL technology. Within the project there will be 650,000 email accounts issued to teachers. Turkish Telecom wishes to reach 1 million users by the end of 2004 who will be signed up for ADSL.
At the moment there is capacity of 75,000 ports in use and another 300,000 ports are to be tendered out in the upcoming months of 2004. By the end of 2004 the CEO of Turkish Telecom, Mr. Mehmet Ekinalan expects to reach a capacity of 2 million ports and have 1 million users. ADSL's other strategic aspect will be its role as a locomotive for the Turkish Government's E-Government initiative. All Government agencies are expected to move onto the new ADSL technology in 2004.

Once the enhanced connection speed is demographically spread out, the next step in Turkish Telecomm plans is to include IP telephony (also known widely as Voice Over IP) to its users. Turkish Telecomm states that its national connection level will be increased 3 times in February of 2004 from 544 megabytes per second to 1.709 megabytes per second. By April 2004, with the increase of ADSL memberships there are plans to further increase the national connectivity to 1.4 terabyte levels.
Since Turkish Telecomm provides the backbone for the ADSL, it does however leave the modem purchase decision to the consumer. ADSL modems sell at the moment around 100-150 USD and the expected market for the modems is estimated at 1 billion USD in the upcoming 2 years.

Cost Of ADSL Usage
The rates announced by Turkish Telecom are priced very competitively as follows:
128 k connection at $ 30 per month / 256 k connection at $ 50 per month / 512 k connection at $ 80 per month

Market access
The U.S. IT hardware and software manufacturer will find that due to time commitment, cost, and complexity of the regulatory and commercial environment, it would be critical to select local representation. Although many people in the larger urban commercial centers understand English language may be a serious barrier in rural areas.

It is therefore imperative that marketing information and user guides be written to the consumers' own language. To win over the local customer, a Turkish language web site would be extremely useful. Having a local representative or partner could help in translating your advertising so as to catch the eye and interest of the Turkish consumer.

For companies seeking to gauge market receptivity, exhibitions and conferences are excellent product launch vehicles. Reconfiguring the user interface and software would not be necessary in the initial market fact finding stages and that once market interest is determined and confirmed can the U.S. company and its local partner look at packaging the hardware and software to meet the needs of the Turkish consumer.

Exhibitions and Marketing Opportunities
Cebit Bilisim Eurasia, 31 August- 5 September, 2004. (www.cebitbilisim.com)
Venue: Tuyap Exhibition Center**, Istanbul**, Turkey
Turkey's largest IT trade show is an excellent venue to enter the Eastern Mediterranean, Caspian and Middle-East markets. For further information on exhibiting at the USA pavilion in Istanbul please contact the US Commercial Service Ankara-details below.

Contact Information:

Ihsan Muderrisoglu
Information Technologies Specialist
U.S. Embassy - Commercial Service
110, Ataturk Bulvari, Kavaklidere
06100 Ankara, Turkey
Tel: + 90-312-467-0949
Fax: + 90-312-467-1366
Ihsan.Muderrisoglu@mail.doc.gov

Ukraine

Telecom

Market Players

Telecommunications and information technology are important infrastructure sectors for Ukraine. The revival of Ukrainian economy after 2000, as well as foreign and domestic investments in telecommunications made over the last 10 years, have brought marked changes in the Ukrainian telecom industry. In 2002 telecom industry revenues grew 20% and reached $1.79 billion. Average level of teledensity was 22.3% . Long distance and international calls accounted for 43% of total industry revenues. Two state-owned wire-line operators Utel and Ukrtelecom processed 95% of long distance and international calls. Local loop generated only 25% of industry revenues. Industry data for the first six months of 2003 shows that total telecom industry revenues grew 21.4%. Long distance and international communications showed 7% growth, while local loop grew 25%. However, mobile communications (38% growth) and data transfer & internet (82.6% growth) are the real industry leaders. Private wire line telecom providers such as Optima, Farlep, Golden Telecom, etc., are slowly overcoming existing Ukrtelecom's monopoly, although their market share is still too small to trigger major changes that would reshape the market. Delay with privatization of Ukrtelecom and ongoing disputes between this company and private telecom operators seriously hurt the development of the whole telecom industry.

Government Role

A new law "On telecommunications" was adopted by the Ukrainian Parliament in July 2003 after three years of debates. Experts believe that the main value of the new law is in separating regulatory authority and industry management by delegating these two roles to two different government agencies, and in establishing a clear definition and distinction of different services and technologies applied in telecommunications. As the old legislation lacked norms and definitions necessary to establish the legal status of many modern services and technologies such as IP Telephony, wireless local loop, etc., regulatory entities ruled the industry at their full discretion. However, as the Ukrainian President did not sign the new law, old legislation is in force that will have a very negative impact on the industry.

Infrastructure and Technology

Ukrtelecom and its subsidiary Utel are the main operators of Ukrainian networks of the international, national, regional level and local loop. Ukrtelecom services 10 million local loop customers through 44 automatic long-distance exchanges (including 18 analogue and 26 digital switches EWSD or 5 ESS type) and 4 international gateways (ISC). The backbone network owned and operated by Ukrtelecom includes 75,000 km of channels and transmission paths. There are 30,000 km of trunk lines in this network connecting country regions, large cities and international channel gateways. The other 40,000 km belongs to regional lines. Transmission paths account for 5,000 km.

Less than 10% of backbone network lines (6,874 km) are fiber optic lines. A substantial part of backbone network consists of analog equipment and cables installed more than 30 years ago. Ukrtelecom builds its development strategy under the assumption that fiber optic and other networks currently built by Ukrtelecom will be used as multi-service carrier for data and voice traffic generated by other operators including mobile operators, ISPs, cable TV companies, etc.

Wireless communications

Obsolete analog networks are circumvented by a growing number of wireless mobile and fixed "overlay" networks. Five Ukrainian operators - UMC, Kyivstar GSM, Golden Telecom GSM, DCC, and Wellcom - offer wireless mobile services in Ukraine in the following standards: GSM900/1800 (UMC, Kyivstar GSM, Wellcom, DCC), DCS 1800 (Golden Telecom GSM), and D-AMPS (DCC). Late in 2002 and early 2003 four out of five Ukrainian mobile operators changed their shareholders. Wireless mobile communications (MC) is the most active sub sector of the telecom industry in Ukraine. MC revenues grew 32.4% in 2002 amounting to $500 million. MC's revenues in 2003 may reach $ 650 million. These revenues represent 28% of the total telecom industry revenues. This successful financial performance ranks MC as the second communications sub sector in terms of revenue after the long-distance and international wire line communications that historically led other industry sub sectors. The number of MC customers may reach 4 million by the end of 2003(compare to 10 million customers of wire line telecom services). Unfortunately, the Ukrainian authorities limit the development of CDMA based MC, allowing this technology to be used only in wireless local loop networks.

Internet and data transfer

Internet services are one of the leading albeit small sub sectors of the Ukrainian telecom industry. As internet service provider's (ISP) business is not subject to licensing, the only credible source of information on this market sector is the size of data traffic processed by Ukrainian telecom networks, especially since internet services account for most of data transfer in Ukraine. Analysis of industry growth in 2003(approximately 80%)and 2002(64%) indicates that customer base for internet services, which was earlier limited to a small number of business professionals and a big but low revenue audience of ad hoc users, has expanded at the expense of the growing number and activity of large and medium size corporate customers, and the general upgrade of the national IT infrastructure. Forthcoming implementation of several major internet related projects financed by the World Bank and Ukrainian Government will give an additional impetus to this telecom industry sub sector. However, further increase of the internet customer base is limited by several factors, and the poor condition of the Ukrainian local loop plays a predominant role.

Hardware

The Ukrainian IT market demonstrates a steady 30-40% annual growth for three years in a row. Experts estimate that the local market was worth $1 billion in 2003. The exact size and structure of the Ukrainian computer hardware market is difficult to measure, since official statistics ignore such key factors as local production and shadow imports of components. Industry insiders estimated the capacity of the local computer market in 2003 at 780,000 units for PCs, 30,000 for notebooks, 20,000 for servers, and anticipated that almost 930,000 PCs, 60,000 notebooks and 25,000 servers will be sold in 2004. All experts underline a trend for decreasing share of desktop systems, and increasing sales of portable systems and servers.

Due to a higher rate of customs duties for imported finished PC's, as opposed to imported components, local production from imported components determines market structure. The exact number of local companies engaged in computer assembly is unknown. There are dozens of small local assemblers of PCs however, only a small number of companies determine the profile of the local computer manufacturing industry. The list of leaders includes among others the following firms: Kvazar-Micro, Everest, Incom, AMY, MKS, Spetsvuzavtomatyka. Except for Kvazar-Micro, an average annual output of PC assemblers doesn't exceed 10,000-20,000 units. The growing success of local manufacturers motivated European Bank for Reconstruction and Development to invest $8 million into the construction of the biggest private computer factory in Ukraine built by Kvazar-Micro Corp. The factory was launched on April 22, 2003. Its capacity allows for manufacturing 200,000 computers a year. Computer manufacturers represent less than 10% of approximately 700 companies currently operating on the local computer market. PCs assembled in Ukraine currently account for more than 90% of the total PC market. This ratio is different with notebooks where international brands account for 70% of the market, and servers, where local manufacturers and importers claim equal share of the market.

The cost structure of the Ukrainian PC market reflects limitations imposed on the market by a cash hungry economy. The most popular PC's that account for 35% of the market cost $300-350 (monitor not included). Approximately 26% of the market belongs to the cheapest models ($200-300) based on Celeron 1100-1200 MHZ or Duron 1200-1300 MHz processors. Models that cost $350-400 account for 17% of the market. The rest of the local market is shared between models that cost $400-500 (6%),$500-600 (15%), and more than $600 (1%).

Government procurement (including education programs funded through state budget) and corporate sector (including banking) account for 65% of the total computer market. The government and corporate markets are dominated by major suppliers of computer equipment. The market share of international brands is much higher in this market sector than on the overall market. The other 35% belong to small and medium businesses, and individuals. This sector although smaller than government and corporate is much more dynamic and is growing quickly. This is also the main market for dozens of small local assemblers of PCs.

For detailed information, please contact: Ruben Beliaev, CS Kiev Commercial Specialist, e-mail: Ruben.Beliaev@mail.doc.gov; The Commercial Service, U.S. Embassy Kiev, 4, Hlybochytska St., Kiev, Ukraine 04050, Tel: (380-44) 490-4058, fax: (380-44) 490-4046.

Software

Steady growth of the Ukrainian economy in 2000-2003, resurrection of local manufacturing industries, solid growth in mobile communications and wireless local loop network development has generated a substantial increase in demand for computer software for industrial and business needs. Additionally, LANs and Internet resources are becoming more and more popular, thus stimulating demand for new software for networking, data storage and browsing. However, the presence of many talented programmers, in an environment with weak International Property Rights (IPR) legislation and enforcement, has earlier encouraged piracy and the flagrant misuse of software. The United States Government, international bodies and business associations cooperated with Ukrainian authorities on improving and enforcing Ukrainian IPR protection legislation. As a result of this activity and of a marked effort by the Ukrainian authorities to fight software piracy, a more legitimate and transparent market for computer software is quickly taking shape. Thus, Microsoft representative in NIS (former Soviet Union) countries announced that company sales in Ukraine grew 81% from October 2002 to October 2003. Microsoft analysts especially underlined substantial growth in sales of corporate software and Microsoft Project product line.

On the other hand, Ukraine is slowly emerging as a low cost site for high quality software development. Industry insiders believe that this sub sector of Ukrainian economy is growing 15%-20% annually with revenues reaching $45-55 million. Some experts estimate that annual revenues generated by software development industry may be as high as $100 million. Unofficial estimates indicate that this industry employs 10,000-15,000 people. The above differences are explained by the fact that the producers work mostly alone or in small groups on outsourced projects ordered from abroad. These export-oriented activities are usually not reflected in official statistics.

There is a growing interest among Ukrainian computer companies to organize software production centers that could participate in international software development projects. Unfortunately, high levels of emigration among qualified programmers as well as controversial Ukrainian legislation and oppressive taxes have delayed development of legitimate software technoparks in Ukraine. Industry experts believe that Ukrainian software development industry offers good opportunities for U.S. firms willing to operate on this market.

For detailed information, please contact: Ruben Beliaev, CS Kiev Commercial Specialist, e-mail: Ruben.Beliaev@mail.doc.gov; The Commercial Service, U.S. Embassy Kiev, 4, Hlybochytska St., Kiev, Ukraine 04050, Tel: (380-44) 490-4058, fax: (380-44) 490-4046.

Contact Information

Ruben Beliaev
Commercial Specialist
U.S. Embassy - FCS
4, Hlybochytska St.,
04050 Kiev, Ukraine
Tel: + 38-044-490-4018 (x4058)
Fax: + 38-044-490-4046
Ruben.Beliaev@mail.doc.gov

United Kingdom

Telecom

Market players
The UK was one of the first countries in Europe to open its market to competition, back in the mid-1980s. Since then, new entrants have flooded in, including many large American and European firms. Even so, British Telecom (BT) is still the largest fixed link operator, though it now faces stiff competition in most market segments. Cable operators NTL and TeleWest are both well established in the consumer segment, and in the business arena, companies such as Colt, Energis and Worldcom compete aggressively for corporate customers. In many cases BT circuitry will still be used at some point during end-to-end transmission of voice and data traffic, regardless of the name at the top of the customer's bill. BT also proved to be in a stronger position than most during the recent slump in the market and it is now well positioned to exploit the opportunities that lie beyond.

The UK also acts as a manufacturing base for many of the world's largest equipment suppliers. Marconi is one of the largest indigenous suppliers, though its future has looked rather shaky recently. Overseas companies operating in the sector include Motorola, Nortel Networks, Ericsson, Hewlett-Packard and Lucent Technologies. All have established centers of excellence in country. But as well as these global players, there are also many smaller firms with big reputations, particularly operating in areas such as chip design and software engineering.

Government role
Licenses to operate telecommunications services are issued by the British government and regulated by OFCOM the newly formed telecoms regulator (from the amalgamation of a number of separate regulators, including OFTEL – the old telecoms regulator). The government is committed to creating a competitive telecommunications environment, and one that favors no one technology class above another. One of the main tasks of OFCOM is to ensure that customers get a fair deal from the industry. In this respect, it has powers to command operators to cut prices and desist from activities it considers not in the consumer's interest.

Infrastructure and Technology
The UK has an advanced telecommunications infrastructure, and acts as a major routing point for data and voice traffic. As well as BT, a number of companies have significant fiber networks connecting major cities with London and beyond. The call center industry is a major UK employer, and data hotels and hosting facilities are a prominent feature of the telecoms landscape, particularly in the London area.

Wireless communications
The mobile communications sector continues to be a big success. Billions of dollars were raised for the exchequer through license auctions, and Vodafone has grown rapidly to become one of that largest mobile phone companies in the world, with operations across the globe. The four main service providers (T Mobile, Orange, O2 and Vodafone) have roughly the same number of subscribers. With penetration rates close to saturation and voice traffic close to peaking, each is keen to boost revenues by encourage data traffic. All are close to launching next generation – 3G – services. But somewhat surprisingly, the first to launch a 3G service was not one of these big four but new entrant '3' – a Hutchison Whampoa company.

Broadband
In many respects, local-loop unbundling failed to produce the expected outcome. Instead of the exercise spawning dozens of start-up broadband providers, BT weathered the storm and came out firmly on top. It still controls most of the consumer broadband market, either as a retailer of its own services or as a wholesaler of services to new entrants. In the consumer area, cable modems, from TeleWest or NTL, provided the alternative for those seeking broadband access. Though broadband prices have fallen, they have fallen from a high starting point. Consequently, significant consumer interest has only recently been ignited.

Future prospects / opportunities
There are few areas of the telecommunications industry that are not fully serviced by exiting established firms or by indigenous start-ups. Opportunities are likely to exist in areas such as mobile data communications and application development and call center technology, etc., however, most large operators are unreceptive to ad-hoc approaches from small suppliers. In which case, identifying a local partner with the right in-country connections can often be the best route to market.

Hardware

Market Players
The UK market for computer hardware is shrinking slightly, with the market estimated to be worth $17 billion in 2003. There are no British companies among the big league of computer manufacturers, though a significant number of the major players operate production and R&D facilities in the UK. Also, over half of the world's top 20 electronics companies have manufacturing plants in country, making it the fifth largest electronics industry in the world in terms of production. Unfortunately, many jobs in the sector were lost during the IT downturn and many others have since slipped away to countries with lower wage rates and less stringent employment laws.

Government Role
The British government takes a hands-off approach to industry in general. It does not support national champions or favor indigenous suppliers over foreign investors in its own procurement processes. It sees its role as one of helping to foster and maintain a

commercial environment in which entrepreneurship and research and development can flourish regardless of its country of origin.

Technology in use

With such a large U.S. presence in the market (suppliers and customers), there is little to distinguish the UK market from that of North America - whatever happens in the U.S. inevitably happens over here, albeit after a short time lag. One area where a small difference may be detected is in mobile communications, where the UK and Europe may be a little in advance of the U.S. in some respects.

Market Driving Forces

The industry is currently undergoing a major change in terms of how IT is used and also how suppliers are marketing products. Increased bandwidth and connectivity in the Internet age is once again leading to a degree of centralization and to a greater use of off-site storage facilities, often for security reasons. Large organizations are taking a hard-nosed look at the value of new hardware and demanding greater functionality at lower price points. Issues surrounding return on investment seems to take precedence over new features and a desire to empower the user. In addition, both businesses and consumers are keen to extend the life of hardware by, for example, upgrading memory and storage rather than purchasing entirely new systems.

Future prospects / Opportunities

The concentration of processing power is leading to greater demand for high-end servers and centralized storage systems, and also slim/cheaper desktop systems and low cost printer options. Storage solutions are always in demand with storage-area networks (SANs) a hot topic within the industry.

With enterprise budgets showing few signs of growth, major vendors are now focusing on small and medium-sized enterprises (SMEs), whose budgets are generally still growing. In the past, this sector has often been ignored in favor of larger enterprises and the consumer, but this is now changing. Vendors are targeting this segment by introducing lower-cost servers and storage systems that are aimed specifically at the SME market.

Software

Market players

The software and services sector is one of the most vibrant and fastest growing areas in the economy, with sales estimated to be worth $40.5 billion in 2004. The software market, including interactive leisure software but excluding services, is currently worth $16bn and growing. Approximately 60 per cent of the total is spent on application software and 40 per cent on system software.

In the UK, 350,000 people are employed in the software industry and over 600,000 in total in computer-related fields. There are almost 100,000 software and IT companies

currently operating in the UK, though most are small enterprises focusing on niche sectors or servicing the requirements of nearby businesses

According to Ernst & Young's European Investment Monitor, software is the largest single sector for inward investment across Europe, and the UK is the prime recipient of such projects with 28 per cent market share. All the major international software companies are represented in the UK, and many use the UK as the regional headquarters of their European, Middle East and Africa operations (EMEA). In many cases, these companies were first drawn to the UK by the language, the country's reputation for world-class academic talent and its highly rated R&D environment

Centers of excellence abound. Cambridge, in the East of England, is home to Microsoft's first research and development center outside the U.S. In Bristol, in the South West, Hewlett Packard has a substantial research facility, and IBM has an impressive R&D presence in the South East of England. The Thames Valley, stretching from Swindon in the West to London in the East, is home to hundreds of high-tech businesses, many of which are household names on both sides of the Atlantic (Computer Associates, Oracle, EDS, etc).

Homegrown software companies also shine on the international stage. Autonomy, based in Cambridge, pioneered the use of sophisticated algorithms to search and categorize information. Its software is used around the world by large organizations, including the U.S. Government. Symbian, born out of the electronics pioneer, Psion, is a leading player in the market for mobile phone operating system software. Sage, based in the North of England, is a major force in the world of accountancy software. Games software has long been a strength. Companies such as Eidos, with its Tomb Raider series of games, has conquered the world, and firms such as Digital Bridges have enjoyed international renown for their games products.

British universities have played a key role in nurturing young talent. Many universities now have strong links to nearby science parks. These are low cost locations where promising research can be developed to the point where additional commercial funding can be found. The best example is the Science Park in Cambridge, though many others exist through out the country.

Government Role

The UK government is very pro-business and is keen to create an environment attractive to both inward investors and indigenous companies alike. At the forefront of the government's efforts in this regard are the Department of Trade and Industry (DTI) and the Office of the e-Envoy. The e-Envoy's office takes the lead on promoting the use of the Internet within government and across the private sector. Though its activities are many and varied, a key component of its remit is to encourage everyone to get online and to promote the take up of broadband technology using whatever technology seems appropriate in the circumstances. The DTI aims to promote enterprise, innovation and increased productivity by encouraging successful business start-ups, and by increasing the capacity of business, including SMEs, to grow, develop skills and exploit

opportunities. Companies wishing to export encryption products to the UK for commercial use should be aware that there are no restrictions other than those set by the U.S. Bureau of Industry and Security. The government is a major purchaser of software in its own right. For instance, the Department of Health is finalizing the last few contracts for a multi-billion dollar IT modernization program.

Technology in use

The technological climate in the UK is very similar to that of the U.S. All the big American software and services firms are well established in the market, as are all the major equipment vendors. One area worthy of particular mention is the growing use of Open Systems Software (OSS), particularly in the public sector. This trend seems likely to continue while government departments remain convinced that OSS can reduce the total cost of ownership of IT systems. Published estimates vary on the savings to be made from adopting OSS ($300 - $1000 per PC), but with approximately one million PCs in use in the public sector, any significant shift to OSS is likely to have a profound impact on suppliers to the sector.

Market Driving Forces

One significant development is the shift aware from an economy built on manufacturing to one dominated by services industries - financial services, insurance, etc. As a consequence, more people are now employed in call centers or back office operations than in traditional heavy industries such as ship building and mining. A key driver of the new service economy is cost reduction through automation and the removal of the human element at the interface with the customer. Using the Internet for B2C commerce has entered the mainstream in a number of markets, namely travel, entertainment and to some extent grocery shopping. In the B2B world, trading portals have disappeared off the agenda for the time being. Instead, firms are concentrating on making the Internet the backbone of their internal and external communication strategies. Outsourcing and off shoring, often to India, also continue to grow, as firms tighten their focus on core activities only.

Internet penetration rates continue to climb, particularly the take up of broadband services by consumers. Benchmarking studies, undertaken on behalf of the UK government, indicate that take up rates now compare favorably with other developed economies and that the services on offer are competitively priced.

ADSL and cable modem technologies are the most popular with consumers, though most other broadband technologies, including fixed wireless and satellite, are available for use in appropriate geographic environments.

Future Prospects /Opportunities

Opportunities exist in all areas for enterprising U.S. companies. Significant growth areas include the implementation and customization of 'out-of-the-box' software and turnkey projects. Outsourcing is also a strong growth area with an average annual growth rate of over 15 per cent. Other areas forecast to grow: are mobile communications, e-business, Internet enabled applications, VoIP and voice recognition systems. U.S. firms should be

aware, however, that with so many well-established firms already active in the market, finding customers or market representation can be very difficult.

Contact information:

Richard Stanbridge
Head of Industry Team
U.S. Commercial Service
U.S. Embassy
24 Grosvenor Square
London W1A 1AE
Tel: +44 20 7408 8037
Fax: +44 20 7408 8020
rstanbri@mail.doc.gov