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A NEW KIND OF VIRTUAL REALITY: THE IMPACT OF INFORMATION TECHNOLOGY ON EURO-ATLANTIC INTEGRATION

It is an honour to be here and to participate in this forum on integrating Croatia into the nations of the Euro-Atlantic alliance. In this symposium, we will hear a lot about a key issue for the 21st century: globalisation.

Today, I'm going to talk about one of the most powerful forces driving globalisation in the 21st century: the digital revolution. Specifically, information technology and the Internet.

It's a cliché to say that the Internet is taking over the world. But sometimes clichés are true.

In fact, it's my opinion that Croatia must have an information technology strategy in order to achieve its goal of full integration into the Euro-Atlantic alliance.

Why? Because information technology, the Internet and knowledge-based industries are becoming indispensable parts of western economies, culture and even politics. These technologies are fast creating a global digital divide. Those without access to the digital tools necessary to plug into 21st century commerce and communications will be left behind. There's no reason why Croatia should be in this category. In fact, Croatia's position as a novice in this area may be an advantage – as other European countries in transition have discovered.

THE DIGITAL ECONOMY TAKES OFF

It's easy to underestimate the importance of the digital revolution because it's so recent and has developed at such remarkable speed. Radio was in existence for fifty years before 50 million Americans tuned in. It took television thirteen years to achieve an audience of this size. But it took the Internet just five years – from 1994 to 1999 – to grow from three million to 100 million users. That's right, today more than half of the entire U.S. adult population has access to and uses the Internet regularly.

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Individual users accessing the world wide web at home, school or work are just part of the reason for its importance in the U.S. economy. Information technology and the Internet have become critical tools for U.S. business growth and productivity, as well.

AN IMPORTANT BUSINESS TOOL

Today American companies invest 45 percent of their total equipment budgets in information technology – and for a good reason. The digital economy has done far more than create new products – such as ATM network banking, on-line stock trading and new forms of entertainment. Every major corporation uses computerized networks to form instant communication links between workers to enhance productivity. These networks also track procurement and inventory, cut costs and deliver goods more quickly to consumers. In fact, the savings generated by on-line inventory control has become so important that the two largest U.S. auto makers – Ford and General Motors – are in the process of moving their entire supply operations to the Internet. With this new system, Ford and GM can deliver customized products to consumers within days instead of weeks. Both companies believe an online supply operation will save them one billion dollars in the first 18 months alone.

Examples like these show why it will be increasingly difficult for U.S. business to partner overseas with companies lacking competence in information technology. Not only does information technology make the physical distance between a company and its subsidiaries irrelevant. But, it helps to ensure direct control in overseas environments where quality-control management techniques may lag behind. That's why Asian manufacturers working for U.S. clients are adding computerized networks to their operations. They're preparing for the day when their preeminence in the offshore labour market is challenged by the new WTO agreement with China. They plan to stay competitive by building in technology-based quality control and logistical support that will add tremendous value for their clients.

The spread of the Internet is creating another business revolution unheard of just five years ago: e-commerce, or the selling of goods and services over the Internet. This year the Internet economy, including e-commerce, generated $507 billion for the U.S. economy – up 68 percent from 1998. That means businesses related to the Internet generate more revenue in the U.S. than telecommunications and the airlines.

What's remarkable about e-commerce and the Internet economy is how much they've stimulated the growth of small businesses in the United States. It costs far less to put up a web page than it does to open a traditional store. With a web site, any business of any size can have the world as its market, instead of just the neighbourhood.

IMPACT ON THE U.S. ECONOMY

It's no surprise that the U.S. government reports that information technology was responsible for one-third of our economic growth during the last four years. In fact, the government tells us that information technology lowered our rate of inflation by one full percentage point in 1998.

It's even affected age-old immigration patterns. For the first time in our history, for example, Irish immigration to the United States has reversed itself – thanks, in part to information technology. That's because the economy of Ireland is experiencing the highest rate of growth in Europe, largely because of exported white-collar technology jobs and new technology businesses started by returnees. Now, more Irish return to Ireland each year than leave for other countries.

It's just one example of what many believe will be a new labour paradigm in the 21st century. Just as the late 20th century was characterized by the export of manufacturing jobs abroad, the 21st century will be characterized by the migration of white collar jobs abroad to more competitive, but technology-ready, labour markets. We're seeing it already. In the last several decades, large U.S. corporations have moved their back office functions such as payroll, accounting and credit card processing out of big cities to more competitive labour markets in the rural Midwestern and Southern United States. Now they're looking for venues in other countries for some of these processes.

REINVIGORATING PEOPLE-TO-PEOPLE DIPLOMACY

The importance of information technology and the Internet, however, goes beyond economics. It's having a profound impact on society and politics. The Internet allows individuals located at great distances from each other to interact with tremendous efficiency, speed and impact at relatively low cost. But it's real power is giving individuals access to mass audiences – something that only television could previously provide to the select few who made it onto the airwaves. Today, through the Internet, the words

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of non-celebrities can echo around the world and influence events with equal or greater force than television.

Let me give you two examples.

– The 1997 Nobel Peace Prize was awarded to an American woman who organized an international campaign to ban the use of land mines over the Internet from her cabin in Vermont. She had no office and no staff. Yet she managed to create a worldwide network of supporters, who influenced the decision of governments, solely through the use of e-mail and Internet-produced information.

Here's another example closer to home:

– When Kosovo was under siege by Yugoslav forces, the U.S. public got a look at what was happening inside that city from e-mail sent to a California high school student by a 16-year old Albanian girl. Her messages about the dangers of her everyday life, read by millions of Internet users and re-broadcast over CNN world news, helped galvanize American support for U.S. military action in Kosovo.

The impact of both of these efforts points to a new era of powerful, people-to-people digital diplomacy. Individuals can easily get around national boundaries to send written, voice and video communications anywhere in the world. If you can't get a telephone line connection to dial into the Internet, you can do it wirelessly through a cell phone or through a satellite uplink – outside your country, if necessary.

While some may worry about where this will lead, I believe this kind of connectedness is a good thing. It's a powerful integrating force. It's like moving in next door. Part of the reason the Albanian girl I mentioned above made such an impact is that she became a virtual next-door neighbour. Through her first-hand accounts, Americans got to know her personally, to befriend her, to care about her. For this reason, the Internet can be a powerful tool for developing mutual understanding, respect and concern between people in different countries and cultures. Through the Internet, Croatia can invite the people of the United States into its living rooms, classrooms and workplaces.

DIGITAL DEMAND RISES IN EUROPE

The digital revolution is important not only in the United States, but in Europe.

Studies report that one-fifth of Europeans use the Internet but that ratio is expected to grow significantly. In

fact, some analysts predict European Internet use will equal that of the United States by 2003 and that the European e-commerce will grow to \$430 billion by that year.

If these predictions are correct, the change won't happen by accident. Many European governments, aware that they are playing catch up to the Atlantic side of the Alliance, are creating policies to encourage Internet access. In September, the German government announced a national technology strategy aimed at giving 40 percent of the German population, or 32 million people, online access by the year 2005. Italian Internet use has jumped from 400,000 people to nearly three times that in the past year alone because of a concerted effort by telecommunications companies to offer free Internet access over mobile phones. And one quarter of the British population is regular Internet users. These are just a few examples of how pervasive the Internet is becoming in Europe.

NEW BREAKTHROUGHS MAY LOWER COSTS

Many people believe the Internet revolution is not for everyone because it requires the sophistication to operate a computer and the money to buy one. While it's true that the Internet is PC-based in the United States, in Europe it is fast becoming linked to the mobile, wireless phone. Europe is way ahead of the United States in mobile phone use because it adopted one standard – GSM technology that works everywhere. Voice activated technology is being developed so that mobile phone owners can dictate e-mail to send over the Internet without using a keyboard.

And soon there will be a third way to access the Internet – via a digital box on top of your television set. In fact, it's becoming clearer and clearer that in the 21st century access will not be the problem it is today. People will be able to access the Internet through whatever technology they can afford – television, telephone, or personal computer.

But the computer will always be important for complicated business uses. And soon even computers may cease to be cost prohibitive. Researchers in the U.S. are aggressively working to create digital computer circuits built around chemical reactions at the molecular level. It would be much less expensive to produce computers built around this concept than electronic circuits etched on silicon chips that have to be manufactured in billion-dollar clean rooms. This development alone could someday make the personal computer as cheap and commonplace as the telephone or the calculator. And this is not a

pie-in-the-sky projection. Major U.S. corporations in partnership with universities are funding this work, which is progressing faster than originally anticipated. The New York Times recently reported that experts predict such computers could become available within the first decade of the 21st century.

DIGITAL PROJECTS TO FURTHER INTEGRATION

Now that I've laid it all out and told you how important and pervasive the digital revolution is – what do we do with it? How can Croatia use these developments to its advantage? How can this technology help Croatia integrate itself into a closer alliance with Europe and the United States?

First of all, the fact that Croatia – like other European countries in transition – has a technology infrastructure gap has some advantages. Take the Y2K problem. The United States and Europe are faced with a huge technical remediation problem because of the inability of some computers to distinguish between the year 2000 and the year 1900. It's a problem that will take literally billions of dollars to fix.

Croatia and other countries without extensive high tech infrastructure can expect the problem to be much less severe. A recent report by Andersen Consulting, entitled "Reconnecting Europe", points to other benefits of the technology deficit in European countries in transition. Because information technology is more pervasive in the West, we are saddled with many older telecommunications infrastructures that are on the verge of becoming obsolete. For example, the streets and backyards of America are being dug up right now to add fiber optic wires to existing underground copper telephone cables. Telephone lines need this extra capacity to carry the huge amount of digital information required when telephones, televisions and computers merge. But Croatia is coming into the digital revolution at just the right time – at the birth of convergence technology. You can "leapfrog" over the West and acquire state-of-the-art infrastructure, ready for the 21st century, in the first instance. Andersen Consulting, in its excellent report on "Reconnecting Europe", surveys several eastern European countries in transition that are doing just that with great success.

Here are some suggestions for ways to use information technology to help Croatia integrate itself into the United States and Europe:

■ **Build closer ties to U.S. educational institutions through distance learning projects.** More than 800 American universities now offer for-credit college courses online. One Canadian University offers a full graduate degree in business administration online and others have plans to follow. Major corporations, such as Cisco, are creating online courses specifically designed to teach workers located anywhere on the globe information technology skills.

Online partnerships with universities and corporations could help Croatia in many ways. Most immediately, it could assist in the development of advanced information technology curriculums for Croat secondary schools and universities. Distance learning could make American university courses available to Croat students who could not otherwise afford to travel to the United States. And information technology could provide Croat universities with an opportunity to create and participate in joint research projects with western universities without actually leaving home.

■ **Build closer ties to U.S. information technology companies, the highest growth industry in the United States.** In particular, you should make it a goal to acquaint U.S. technology companies with the high level of academic standards, particularly in mathematics, in your schools. It is an unfortunate fact that many European children have far greater math skills than American students – particularly at the gymnasium level. It's not surprising to me that a team of Croat students who recently participated in a nationwide U.S. computer science competition nearly won – despite the difference in their technical resources. The high level of academic skills of your gymnasium and college students is a real advantage in the international competition for skilled knowledge industry workers.

■ **Participate aggressively in the lucrative market for information technology professionals.** As robust as the information technology sector is, its growth is being hampered worldwide by a shortage of professionals trained in information technology. The U.S. projects a shortage of 850,000 technology workers by 2002, and Europe will have a projected shortage of one million information technology professionals by that year. In fact, the number of U.S. students pursuing high technology degrees is declining, while our needs are increasing. Through corporate and academic partnerships, Croatia could help fill this gap in IT professionals by encouraging its students to study these subjects, which

offer the promise of immediate employment after graduation. Some of these graduates will go abroad to work in technology companies. But some will undoubtedly use their education to set up their own ventures here.

■ **Assist enterprises to reorganize production and modernize technology infrastructure.** As I mentioned above, American business invests in technology because it is crucial to remaining competitive and cutting costs of production. In "Technology as an Enabler of Transition", Andersen Consulting charts the success of businesses in Poland, Hungary, the Czech Republic, Slovenia and other transition economies that are using technology to reorganize production and become competitive. One of their case studies is the Polish ship building industry, which was on the verge of bankruptcy in 1990. By 1995 this industry had turned itself around, which management attributes to a qualified workforce and the acquisition of leading-edge technologies. I know that shipbuilding is an important industry to Croatia and information technology could help you establish a competitive edge in that field.

■ **Spur the growth of an information technology industry within your own borders by developing legal protections for intellectual property.** Many analysts believe the lack of such protection in many of Europe's transition economies is a major barrier to developing more homegrown software and hardware entrepreneurs.

■ **Encourage the growth of local Internet service providers**. Let me mention one example of how strong the market is for this kind of service, even in the most difficult of circumstances. The Boston Globe reported on a young Albanian man who opened an Internet cafe in Pristina, Yugoslavia just two months ago with the help of an American partner located in Douglas, Massachusetts. The American partner provided the capital and flew over the satellite uplink facilities to get the Pristina Internet connection up and running. Now – despite frequent power blackouts – this Internet cafe is thriving. I know from my own searches on the Internet that there are many Croats already on the worldwide web. But Croatia might consider following Germany's lead and develop a nationwide strategy to ensure even greater Internet access that encompasses rural, as well as urban, populations. This could be accomplished in many ways, including public access through libraries, kiosks in municipal buildings and many other venues. This is particularly important if you want to grow an e-commerce industry. A recent study by International

Data Corporation of 28,000 Internet users in 80 countries found that interest in the purchase of goods and services over the Internet is surprisingly widespread. Even in less developed countries like China and India, 25 percent of survey respondents had purchased something online in the three months surveyed. With its ability to cross national boundaries, e-commerce could help Croat businesses open up new markets in a cost-effective manner.

■ **Reinvigorate people-to-people diplomacy in a cost-effective manner through the Internet.** Student, athletic and cultural exchanges are a time-honoured way of promoting contact and understanding between nations. But they can be expensive and difficult to arrange. Internet exchanges, on the other hand, are relatively inexpensive to sponsor and have a multiplier effect because they can reach many people simultaneously. I envision, for example, Croat school children adopting classes of American e-pals and corresponding with them over the Internet on a regular basis. This dovetails with the U.S. government's strategy to put computers into every school in America. I might suggest, as a practical matter, that a state like West Virginia would be a good place to start this project. That state is well on its way to putting computers into every classroom and teaching every elementary school student how to use them.

CONNECTIVITY: A 21ST CENTURY GIFT

These are just a few practical suggestions on how to use information technology and the Internet to further the process of integrating Croatia into Europe and the United States. As I mentioned in the beginning of this paper, information technology is becoming an indispensable part of western economies, cultures and politics. It will be impossible to plan a strategy to integrate Croatia with the West without taking this force into consideration. In fact, digital information technology is already at work integrating our economies, cultures and politics – whether we like it or not. My recommendation is to acknowledge this process and get out in front of it, devising ways to use this technology to enhance productivity, create economic opportunities and encourage positive ties between our two countries.

President Tudjman implicitly recognized the importance of the digital information revolution when he noted in a 1997 economic report to the nation that, "We live in

a world where knowledge is increasingly playing a key role in every field. Therefore, investing in people becomes as important as investing in any other field, if not more so." That's what the digital information revolution is all about. At it's heart it's not about circuits, but about individuals. It removes the final barriers of distance between individuals and empowers them to communicate, teach, learn and engage in commerce with one another on a worldwide scale.

This new era of connectivity is a gift. It gives us a powerful new tool to learn about one another. I believe we should seize that opportunity. Over time, as we get to know each other better, I believe that our mutual understanding and respect will grow. I look forward with great enthusiasm to the deeper bonds that information technology will help forge between Croatia, the United States and Europe.

Thank you.

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