

Chapter 14

The IT Sector and How to Improve the Legal Framework in Bosnia and Herzegovina

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BIT Alliance is the leading association of software companies in Bosnia and Herzegovina, comprised of the most prominent firms in the information technology sector. The members reached 40 million BAM worth of exports in 2015 alone, and are employing 700 highly qualified staff. There are currently an estimated 2,500 to 3,500 programmers in Bosnia and Herzegovina.

Occupational associations of IT companies, such as BIT Alliance, are a critical factor for the development of growing IT industries. In Croatia, there is the Association of Software Exporters CISEx and in Serbia, the ICT Cluster in Vojvodina. In Bulgaria, several organizations are engaged in specific activities contributing to the development of the IT industry. Some of them were founded as early as 2001.

The development of the software industry in Bosnia and Herzegovina did not result from strategic measures of governmental institutions, as is the case in Romania and Bulgaria. The IT sector in BiH, and primarily the software industry, developed as a consequence of private sector IT start-ups, with contributions from the international diaspora. Even though this sector has lacked institutional support, the aggregate of IT companies has succeeded to develop a respectable industrial branch.

IT companies are typically divided into hardware firms and companies involved in software. Bosnia and Herzegovina has not yet developed the production of hardware components. Existing companies, even though employing large numbers, are mainly engaged in the distribution of their products. There are two groups of software developers: those who develop and create their own software solutions, and those who are in outsourcing, commissioned by successful international companies to develop software applications. BIT Alliance members are both developers of software and companies who provide programming services for foreign companies (outsourcing), which is currently the most promising segment of IT activities.

Projection of economic benefits from software industry development in Bosnia and Herzegovina

According to a preliminary analysis of BIT Alliance, the annual income per software engineer ranges between 80,000 and 120,000 BAM. For example, the training of 1,000 new software engineers Bosnia and Herzegovina could generate—primarily from exports—more than 90 million BAM per year. With 12,000 software engineers, the BiH software industry could generate over one billion BAM of revenue and nearly equate its revenue with the strongest economic sector in BiH, the wood industry. For the sake of comparison, in the city of Timisoara (Romania), whose population size is similar to Sarajevo's (BiH), 7,000 software experts are trained every year through the Romanian educational system. By 2020, there will be about 300,000 IT experts in Romania. A shortage of software engineers in the world today amounts to 2 million and it is further increasing.

1 software engineer = 90,000 BAM annual revenue

12,000 software engineers x 90,000 BAM = 1,080,000,000 BAM annually (one billion and 80 million BAM)

25,000 software engineers x 90,000 BAM = 2,250,000 BAM annually (2 billion and 250 million BAM)

Bosnia and Herzegovina has the potential to train 25,000 software engineers. Thus, the software industry in Bosnia and Herzegovina, with an annual revenue of 2,250,000 BAM, would become the most powerful BiH industry and a driving engine for the country's economic development.

This chapter aims to offer strategic solutions for crucial shortcomings, challenges, and problems in the development of the software industry in BiH. This can be summarized as follows:

- A lack of trained IT staff and a lack of IT education;
- Underdeveloped IT infrastructure and lack of support for its development and;
- An unfavorable business and legislative environment.

Current State of Affairs

Shortage of IT staff

Despite the fact that existing BiH companies have almost limitless possibilities for opening new work places in terms of administrative costs and support, their long-term existence is uncertain due to an insufficient number of trained professionals. Even now, they often find themselves rejecting exceptionally lucrative business opportunities due to labor limitations. Hence, the country directly loses millions of BAM on an annual basis. Bosnia and Herzegovina shares the destiny of other countries in the region, who suffer from an increasingly pronounced trend of IT brain-drain.

However, the problem in Bosnia and Herzegovina is even more noticeable given the weaknesses of its educational infrastructure relative to the educational systems in neighboring countries who “produce” a larger number of IT professionals. In addition, there is a lack of practical work training for IT professionals in order to keep up with developments and exceptionally fast development of new technologies. This appears to be the largest problem for the software industry in Bosnia and Herzegovina. Not only can this prevent further growth, but it can also make the entire sector stagnate, or even backtrack. Replacements for trained staff cannot be found in the current domestic or regional labor markets. Skilled labor has to be “trained.” The weak infrastructure and an unfavorable legal framework have a direct and indirect effect on the shortage of domestic IT staff.

Weak IT Infrastructure and a Lack of Support for its Development

Bosnia and Herzegovina is positioned at the very bottom of the list when it comes to investments in research and development. As a whole, BiH spends a mere 0.04 percent of GDP on the IT sector, while the world average is 2.7 percent. Yet, software companies contribute significantly to the country’s GDP, annually allocating up to 10 percent of revenue for research and development of new products and services in addition to investing ample resources for the training and education of their employees. Nevertheless, Sarajevo, Banja Luka, and Mostar only have one technological park each.

In contrast, Germany had 32 technological parks back in 1992. As a result of planned development, Berlin alone has 10,000 IT companies generating an income that exceeds 26 billion BAM, almost equal to the overall GDP of Bosnia and Herzegovina. The German IT industry

employs over 100,000 people. Ljubljana and Zagreb also have highly developed technological parks, founded in the early 1990s. Today, the Technological Park in Ljubljana comprises over 300 companies with more than 1,500 employees, mainly in the IT sector.

There are no state funds set aside for the development of the IT sector. Previously, IT companies could not apply for development funds. The lack of support by domestic companies is evident (mainly with majority state ownership) by means of using domestic software solutions. On the other hand, examples of successful long standing cooperation can be found in relations between economy and IT sector, for example in financial services sector. In this sector, domestic IT companies design and implement specialized products. Until today a significant progress has not been made in introduction of e-service in public sector in BiH, hence domestic IT sector had no opportunity for its own development in this way.

Unfavorable Legislative Framework and Business Conditions

Government institutions and the wider public lack a general understanding of the IT sector. As a result, strategic support for the IT and software industry is lacking. This is particularly true compared to developed countries, but also relative to BiH's neighbors. Hence, BiH is lagging behind in terms of institutional support for the IT sector. Earlier government initiatives (policies, strategies and action plans for the development of the information society in BiH 2004–2010), even though outdated and inadequately implemented, have made progress in public awareness, but not in the context of support for the development of the software industry. In addition to lacking strategic documents, and most likely as a result of this, the country failed to adopt laws and regulations, establish an independent authorized institution, or implement financial measures. In short, the software industry has not been recognized as a strategic branch for the economy. The little public information available to attract foreign investment is outdated and provides erroneous guidelines to potential investors. It is encouraging that a new strategic document at the BiH level (Policy of information society development in BiH, Ministry of Communications and Transport BiH), even though not adopted, recognizes the software industry as a separate and important segment of the IT sector.

In a rapidly changing environment of technological development and market adjustment, the development of the software industry requires a concrete institutional approach. Strategic support for the software industry in other countries of the region have placed it ahead of BiH. For example,

concerning export of information technologies services in the context of overall export, Bosnia and Herzegovina is ranked 77th in the world, while Romania takes 18th place, Macedonia 37th, Bulgaria 41th, Montenegro 45th, and Croatia 50th place. Except in terms of internet usage, BiH is rated below all its neighboring countries. Bosnia and Herzegovina is falling behind mostly in the quality of IT education and training, as well as the lack of institutional support.

Similar trends are recorded in neighboring countries, with the exception of Romania (where the software industry takes third place of industries with the largest exports), has managed to advance its software industry to the most promising sector and the best business promoter for its country.

Advantages and Potential of the Software Industry, Examples in Other Countries

The software industry contributes significantly to the overall GDP in BiH. Even though the industry cannot be compared to other branches of the economy in terms of overall exports, most notably with the wood processing industry which records exports exceeding one billion BAM, it does offer significant advantages for the BiH economy and its citizens. Software companies provide high class working conditions, salaries that are often 50 percent higher than the average BiH salary, ecologically clean products, the industry with the fastest growing exports, limited imports, high revenues, limited initial investment and ease of opening up shop. It is also significant in terms of its role in reducing brain-drain and the fact that new work places in this industry do not undermine development and business operations of smaller firms, which is often the case in other industry branches.

In addition to the numerical advantages over other industries, IT companies and their software solutions are a critical leverage for the development of other industries. According to research results, small and medium size enterprises (SMEs) who use innovative technologies, increase their revenue by up to 15 percent faster and open new work places almost twice as fast compared to their competitors. Also, the value of software industry is reflected in the fact that 60–70 percent of its labor in BiH constitutes of young people under the age of 35.

The software industry in BiH, though not very large, is advanced and competitive on the world market for outsourcing). IT engineers in BiH

often have years of experience in the world's leading software corporations, so in terms of their knowledge, skills, experience and insights into modern trends, they are frequently ahead of their colleagues in other European countries. This is important to note, because the revenue growth from BiH software companies has ranged between 200 percent to as high as 1,400 percent, and new employees have been added by a rate of almost 600 percent.

In neighboring Serbia, software exports exceeded the exports of traditional products such as raspberries and corn, contributing more than 580 million euros in 2015. In Croatia, 1 percent of the overall labor force, or an estimated 12,000 employees, works in software production.

Course of Action

BIT Alliance has implemented a number of projects aimed as a response to the above-mentioned challenges of BiH's software industry. Among other things, a six-month professional education program "BIT Camp" was organized. As a result, 50 new programmers who completed their training received employment offers in BIT member companies. The "BIT Camp" has showed that intensive educational programs can effectively re-train people from diverse backgrounds such as political scientists, economists, or lawyers into IT specialists employable by the IT industry.

However, the high cost of education and training and the lack of subsidies and support halted the further implementation of this project. In order to have systematic solutions, the software sector needs participation of state institutions with a comprehensive and strategic approach.

BIT Alliance stresses the need for the software industry to have a separate development strategy, or to become a separate part of a strategic document for IT development at the national level due to specificities of its development, and in line with good practices of countries in the world and the region. A more specific approach on the national level would positively affect the IT sector's development at lower levels of government.

Even though the BiH Ministry for Communication and Transport is primarily responsible for the promotion and strategic development of the IT sector, it is necessary to involve other institutions as well, primarily the Ministry of Foreign Trade and Economic Relations, and the BiH Ministry of Foreign Affairs. Best practices from other countries in the region show a strong engagement of state agencies for the promotion of

their IT sectors.

After adopting a strategic document, all levels of government should adopt specified action plans. Such plans should specify support for start-ups, IT clusters, the setting up of IT parks, introducing tax reliefs and financial incentives for companies investing in research and development, subsidies for participation costs in foreign markets and fairs, improvement of the legislative framework, and most importantly, the improvement of education in the widest sense: revision of elementary and secondary school, and university curricula to better meet the needs of the IT industry, increase the number of students at technical faculties, re-training programs for the unemployed, improvement of scholarship policies, continued education and training of IT teaching staff according to the latest technological developments and changes in the market. It is also necessary to enhance development of informal education, spreading of informal IT education, online IT education and professional advancement.

The European Union is planning to invest almost 50 billion euros for the development of its digital infrastructure in the next four years. This could be an opportunity for Bosnia and Herzegovina as well.

Within this initiative, BIT Alliance does not merely identify problems and propose adequate solutions, but also offers cooperation with governmental institutions at all levels of government. It wishes to provide concrete contributions in implementing all plans and activities envisaged by future policies, strategies and action plans for the development of Bosnia and Herzegovina's software industry.

Appendix: A BiH IT Success Story

A success story in Bosnia and Herzegovina's IT sector is Lanaco, the largest private system integrator and one of the most successful family IT companies in the Western Balkans, based in Banja Luka. The company was founded in 1990 in Banja Luka by Nebojša Ninić, who applied years of experience from his work in companies of the former Yugoslavia, including Rade Končar, Incel, Čajavec, and Medicinska Elektronika.

Today, Lanaco's business operations consist of 10 departments with more than 280 employees. These young, highly educated specialists are on average 28 years old and own more than 1,000 vendor certifications. Lanaco customers come from a wide range of sectors, including health-

care, education, tourism and hospitality, media, construction, manufacturing, retail, NGOs, and government institutions.

Part of Lanaco's market success lies in the fact that 80 percent of the company's revenue comes from its own products and services. Due to the healthy business model, the company is in position to annually invest 3.2 million euros in software development and more than 1 million euros in the education and training of its employees. These investments provide Lanaco with competitiveness on the regional market and create conditions for sustainable growth.

Aside from establishing a healthy financial plan, the company pays much attention to corporate social responsibility. Lanaco dedicates most of its efforts to projects involving students, in both in secondary schools and in universities. The latest education project introduces programming in secondary schools, and is named *Kamp mladih programera* "Pitam DA" (*Programmers' Youth Camp "I'm asking, YES"*).

Last December, the company opened its new headquarters with work space for 500 employees. The Lanaco Technology Center includes two facilities with a total space of 10,000m², and is the biggest of its kind in Bosnia and Herzegovina. The heart of Lanaco Technology Center is its Tier 4 Data Center, which is part of Cisco Intercloud. Technology Center is also home of the biggest multi-vendor IT conference in Bosnia and Herzegovina, *Tech Hosted by LANACO*. This three-day conference has a regional multi-vendor matrix concept and is aims to connect global IT leaders with different segments of the public, including students.

Lanaco has received many vendor awards, most recently the Microsoft Country Partner 2016 in Toronto during the Microsoft Worldwide Partner Conference (now called *Microsoft Inspire*). Apart from this award, the company also received SAP silver and bronze awards for two consequent years, in 2016 and 2017, for the Central Eastern Europe in Business Transformation category. The Company's achievements in education were recognized by the Cambridge University publication in 2015 titled "Inspiring leadership and innovation," and in the 2014 edition titled "The Guide to Excellence."¹ In addition, Lanaco has been recognized by the public in Bosnia and Herzegovina as one of most sought-after employers, and has received several

¹ "LANACO in the Publication of the University of Cambridge." Lanaco. June 16, 2017. <https://www.lanaco.com/eng/News/Pages/LANACO-in-the-Publication-of-the-University-of-Cambridge.aspx>.

acknowledgements by Posao.ba, the leading job portal in the country, as the best employer² in Bosnia and Herzegovina's ICT sector.

Since April 2016, Lanaco is participating in the London Stock Exchange ELITE Program, yet another international confirmation of the company's business strategy validity, but also an opportunity to further develop its existing management approach, all the while having in mind the forthcoming requests of digital transformation on the global market.

² "LANACO most desirable employer in the ICT sector this year." Lanaco. April 28, 2017. <https://www.lanaco.com/eng/News/Pages/LANACO-most-desirable-employer-in-the-ICT-sector-this-year.aspx>.

