

# Building competitiveness on IT industry: the case of Osijek Software City

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# **BUILDING COMPETITIVENESS ON IT INDUSTRY: THE CASE OF OSIJEK SOFTWARE CITY\***

## **ABSTRACT**

Although eastern Croatia, due to its natural resources and very good geographic location, used to be industrially highly developed, nowadays it is one of the least developed regions in the Republic of Croatia. Driven by a war situation, the disappearance of traditional industries (textile industry, furniture, food-processing, metal working) contributed to weak development. With market opening and disappearance of labour-intensive industries, the need for change in thinking became obvious, together with education and encouraging of self-employment.

Rapid development of ICT in the world on the one hand and the involvement of numerous highly educated and enthusiastic IT experts on the other has increased the development of IT industry in Osijek. This is an industry where market has no limits, entry costs are low and revenues are relatively high. Since numerous IT start-ups were founded in the area of Osijek, several people, mostly owners of those enterprises, decided in 2012 to initiate the project named Osijek Software City (later abbreviated to OSC).

In this paper, the case study of OSC will be shown in detail, as well as its influence on the region's competitiveness. The key point of OSC initiative is employment of IT related and educated young people since there is a deficit of quality staff in the regional IT industry.

For the purpose of this paper, the interview with the OSC Association secretary has been conducted, which showcases their achievements from the initial stages to the present. In addition, future trends of local IT industry will be assessed.

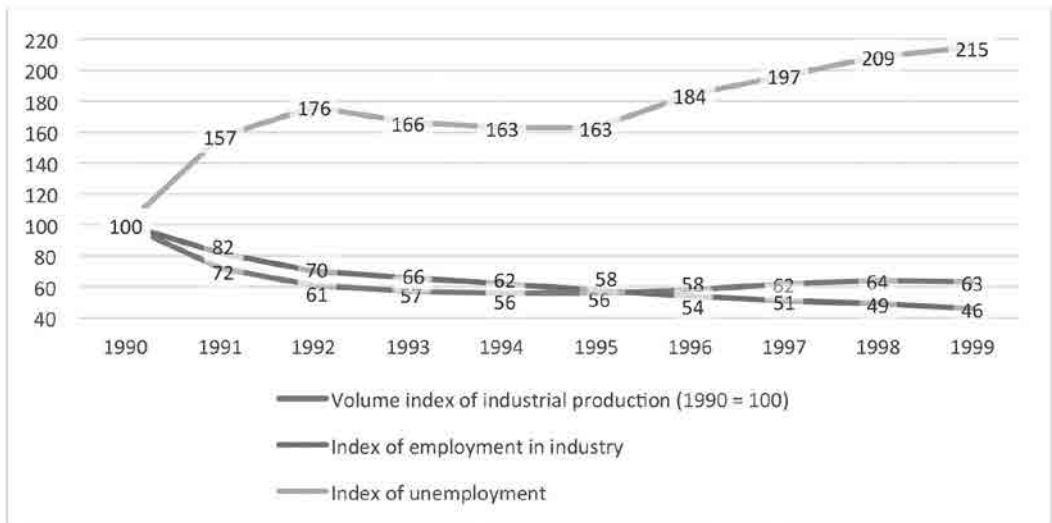
**Keywords:** IT industry, Osijek Software City, employment

## 1. Introduction

Even during the Austro-Hungarian Empire, alongside Zagreb, Rijeka, Karlovac and Sisak, Osijek became an industrial centre in development, as the capital of East Croatia with an excellent geographical location. In that period, natural resources such as fertile land and forests were mainly used in manufacturing. The industrial development became stronger during former Yugoslavia wherein Croatia, together with Slovenia, was the most developed region (The Miroslav Krleža Institute of Lexicography, 2014).

In their analysis of the position of Croatian economy in Yugoslavia, Druzic and Sirotkovic (2002:114) argue that Croatia in the period from 1945 to 1990 recorded significant economic growth. According to The Miroslav Krleža Institute of Lexicography (2014), in 1990 Croatia was, with Slovenia and the Czech Republic, among the most developed Central European transition countries and the level of pre-war GDP (1990) was only reached again in 2004.

**Graph 1** Indexes in the industry and unemployment in the 1990's



Source: adapted from Družić, G. (2001). *Kriza hrvatskoga gospodarstva i ekonomska politika*. Zagreb: Golden marketing, pp. 21, based on Croatian Bureau of Statistics, *Statistical Yearbook 2000 and monthly statistical report 12/2000*

Export of Croatian products was reduced to former Yugoslav countries, significant market of loyal consumers, protected by customs duties and lost during the war and disintegration of Yugoslavia. On the other hand, new Western European markets were opened, which Croatia was yet to win, as a small Balkan country and a former member of the Federal Republic of Yugoslavia. With opening up the market, there were also new competitors who had not been present in the closed domestic market, and whose size, strength and experience of business on the open market were a great advantage compared to the unprepared and war-devastated Croatian companies whose adaptation was very slow.

The transition to an open market economy especially related to industrial production, but unfortunately, it had „many negative social and economic effects: the impoverishment of the population, a rise in corruption and economic crime, the devastation of industry and an increase of unemployment rate“ (The Miroslav Krleža Institute of Lexicography, 2014).

The increase in the unemployment rate during the 1990s is shown in Graph 1, as well as indexes of the volume of industrial production and employment in the industry.

**Table 1 Enterprises in the ICT sector**

Item	2009	2010	2011	2012	2013
No. of enterprises	4,474	4,886	4,966	5,386	6,057
No. of employees	31,287	31,660	32,851	33,168	33,510

Source: created by the authors (according to the Croatian Bureau of Statistics)

It can be concluded that poor indexes in the industry affected greatly the rapid growth of unemployment.

With gradual disappearance of traditional industrial branches and large (mainly manufacturing) companies, there was an appearance and intense growth of private initiative in many areas, particularly in the commercial sector.

An identical phenomenon occurred also in the IT sector. As Lovrek and Frkovic state, "at the beginning of the twentieth century, with the disintegration and disappearance of then relatively large IT companies as well as computer centers of a number of big companies that disappeared in the privatization process, the IT industry disintegrated. Enterprising IT professionals, former employees of these companies, created hundreds of new small IT companies, so that in 1999, out of a total of 1,141 registered IT companies, only three had a little more than 100 employees, while 958 had less than 10" (Lovrek, Frkovic, 2012:15).

Initially, these companies were mainly involved in the sale of computer equipment and final configurations, and there was virtually a negligible number of those who were engaged in creating software solutions, in other words, selling their own knowledge. Even these companies were doing simple business applications for small and medium enterprises. The same authors (Lovrek and Frkovic, 2012:16) argue that the reason was the inability of the company to reach a critical mass in terms of technical expertise, financial strength, and management and marketing skills necessary to work on larger and more complex IT projects. With time, the enterprising and successful among them established partnerships with international IT companies. By doing so, they gained necessary expertise, began to realize faster growth and expand business in the whole country, and then to neighboring countries.

This gradually set aside about thirty IT companies, primarily local, and some of them became regionally significant, both in the distribution and sales of IT equipment, as well as in the areas of system integration, software production and implementation of software solutions.

However, economic activities that were slowed down during the war, inadequate privatization with severe consequences, lack of industrial strategy and appropriate incentive policies, relatively modest economic growth, overvalued Kuna, along with the limitations of a relatively small market, have resulted in the Croatian IT losing the race with neighboring countries (Lovrek, Frkovic, 2012:16).

## 2. Trends in ICT industry in Croatia

The predominant part of the ICT sector nowadays are small enterprises, so that in 2013 the number of companies with 1-9 employees amounted up to 92.1% of the total number of enterprises in the sector. The following (Table 1) will show the number of firms, number of employees and turnover in the ICT sector (Group J - Information and communication according to NACE<sup>1</sup> in 2007) for the period 2009-2013.

Compared to 2009, the number of firms in the ICT sector in 2013 increased by slightly more than 35%. According to unofficial data, the growth has continued in 2014. At the same time in the whole economy (according to data of the Central Bureau of Statistics) the number of companies increased by 18%, which means that the number of companies in the ICT sector grew twice as much as in the whole economy. Kovacevic and Vukovic (2007) find that higher rates of inputs in the ICT sector compared to the Croatian average are the result of the fact that this is a young industry, and that there is a growing market demand for their products. The fastest created were new companies involved in ICT services, as opposed to those that deal with assembling computer equipment (57 companies in 1999 and only 9 in 2009). (Lovrek, Frkovic, 2012:18)

Table 2 shows the number of enterprises by number of employees. Number of employees is divided into four grades – 1 to 9, 10 to 49, 50 to 249 and more than 250 employees.

**Table 2 Number of enterprises by class size of employees**

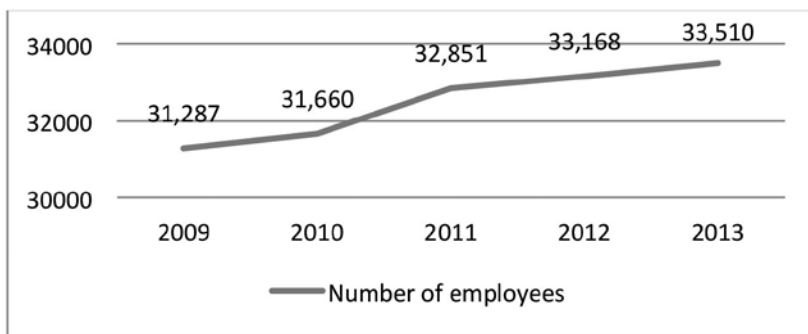
No. of employees	2009		2010		2011		2012		2013	
	Count	%	Count	%	Count	%	Count	%	Count	%
1-9	4,037	90.2 %	4,450	91.1 %	4,485	90.3 %	4,907	91.1 %	5,577	92.1 %
10-49	375	8.4 %	377	7.7 %	409	8.2 %	407	7.6 %	408	6.7 %
50-249	49	1.1 %	47	1.0 %	59	1.2 %	59	1.1 %	60	1.0 %
> 250	13	0.3 %	12	0.2 %	13	0.3 %	13	0.2 %	12	0.2 %
Total	4,474	100.0 %	4,886	100.0 %	4,966	100.0 %	5,386	100.0 %	6,057	100.0 %

Source: created by the authors (according to the Croatian Bureau of Statistics)

Table 2 indicates that every year the number of large enterprises with more than 250 employees almost does not change. In 2013, these companies were only 0.2% of the total number of enterprises in the ICT sector. The number of companies that have from 1 to 9 employees ranges between 90% and 91%, with tendency of further growth, so that in 2013 such enterprises made up 92.1% of total enterprises in the sector.

Graph 2 shows the number of employees in the ICT sector for the period 2009 to 2013.

**Graph 2 Number of employees in ICT sector**



Source: created by the authors (according to the Croatian Bureau of Statistics)

From Graph 2 it can be concluded that the number of employees in the ICT sector continues to increase (in 2013 there were 7% more than in 2009), unlike the industrial production as a whole and the economy in general.

The biggest growth in the IT industry in 2013 was noted in the area of packaged software (4.7%). Hold-

ers of the development are small domestic producers of ERP, such as PIS, Laus, Spin Informatics and Login on the one hand, and the rise of Microsoft on the other hand. Growth of 1.4% in 2013 compared to 2012, to 1.93 billion Croatian kunas, captures the IT services market, ruled by HT's Combis. The only area in which the IT market continues to decline is the hardware area, which was reduced by one percent, to 3.24 billion (Ivezic, 2014a).

However, trends in the local IT scene are changing, and so according to Ivezic (2014b) and recent surveys of Business Journal, the number of large IT companies with over 200 employees has doubled, and now there are seven of them.

These seven companies in 2013 employed a total of 2100 workers. Nevertheless, smaller IT companies, especially software start-ups, are still the highest total generator of new jobs in the industry.

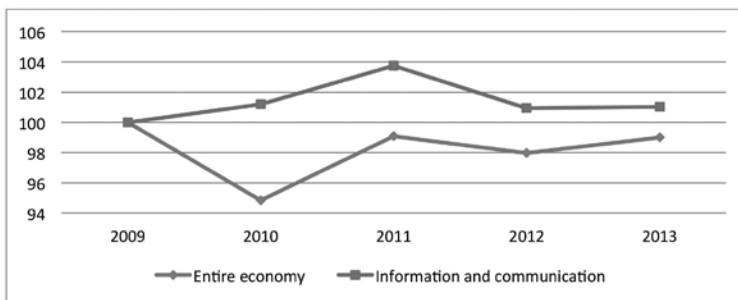
It should be noted that the study only deals with the IT sector, which means that companies that are engaged in communication activities are not included.

Croatian accession to the European Union should open new major IT projects related to EU funds and regulatory and statutory adjustments, especially in telecommunications, finance, public administration, healthcare, as well as the arrival of major new international business to Croatia. The European market will, in turn, bring in new foreign ICT companies in Croatia and they will become equal competitors in the domestic market. There will also be a significant growth in potential market for Croatian companies, which will bring local ICT companies into brand new conditions that will require a higher level of knowledge, skills, expertise, competencies and resources (Lovrek, Erkovic, 2012:29).

According to Kovacevic and Vukovic (2006:237), young companies developing and implementing new products and technologies often depend on highly educated workforce and managerial talents. This demand for quality labour force depends on the education system. Good programs in schools and universities could lead to the necessary fund of knowledge, skills and talents the economy could draw from for their needs.

The importance of studies that support the ICT sector has been recognized by the Josip Juraj Strossmayer University of Osijek where Economics, Electrical Engineering and the Faculty of Humanities and Social Sciences in the past few years have been offering their students study programs related to information and computer science.

**Graph 3 Index of the number of employees in the ICT sector and the overall economy, base = 2009**



Source: created by the authors (according to the Croatian Bureau of Statistics)

Interest in enrolling in such courses is increasing each year for the simple reason that the ICT sector is currently not aware of the crisis on the labor market.

In order to better understand the importance of the ICT sector for competitiveness and development of the entire Croatia as well as its eastern region, presented below is a comparative analysis of the total turnover in terms of number of employees in overall economy and in the ICT sector.

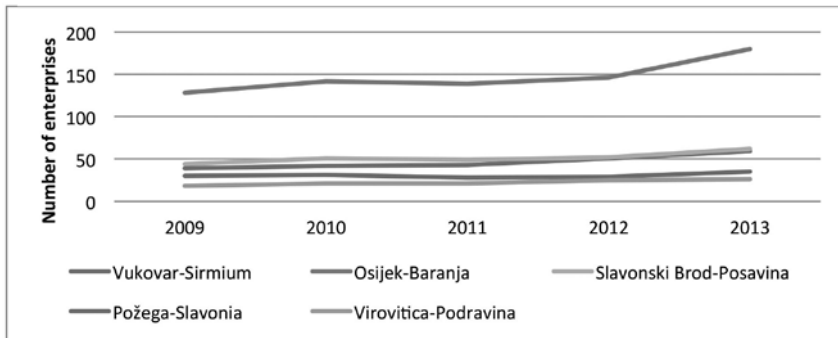
Graph 3 shows the trend in the number of employees in the ICT sector and in the overall economy.

It is visible in Graph 3 that the ICT sector records a somewhat higher level of employment growth, but the difference is still decreasing. According to research conducted by Kovacevic and Vukovic (2007:108), who showed the trend in the number of employees in the ICT sector and the overall economy for the period from 2001 to 2004, the trend in the number of employees was below the average of the Croatian economy.

If the aforementioned research and the current state shown in Graph 3 are taken into account, it can be concluded that the ICT sector in the last few years, however, reaches higher level of growth of employees than the total economy.

This study takes into account only legal entities engaged in the activity from the group J - Information and communication according to NACE 2007. However, an entirely different side exists there, and it is gray economy. One often enters the ICT sector quite early in life (14-18 years) and there are relatively numerous young talents who are not recorded in official statistics and they handle their affairs at home without any special contracts, often without financial control.

**Graph 4** Number of companies in the ICT sector in the eastern Croatian counties

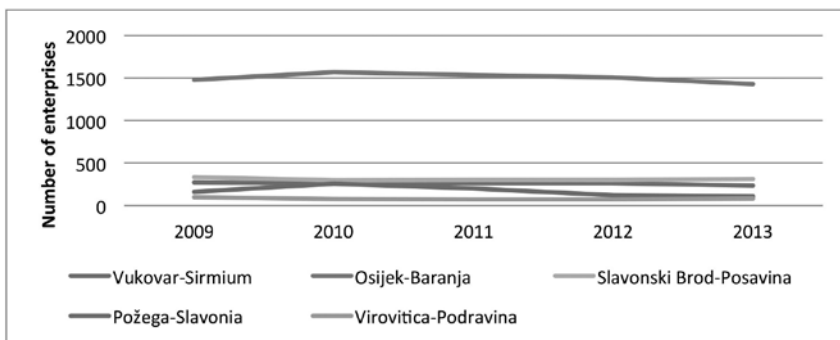


Source: created by the authors (according to the Croatian Bureau of Statistics)

In addition to these individuals, there are freelancers<sup>2</sup> who are also not included in these statistics, and because of the insecure situation in the labor market, there are more and more of them.

Based on previous research, the research objective of this paper is to identify the key factors of change in the economic system and the socio-economic environment that led to the emergence and strengthening of the ICT sector in regional development of eastern Croatia and to assess the possible directions of development of regional ICT sector. It is assumed that the strengthening of the ICT sector in eastern Croatia had a positive impact on the competitiveness and development of the region.

**Graph 5** Number of employees in the ICT sector in the eastern Croatian counties



Source: created by the authors (according to the Croatian Bureau of Statistics)

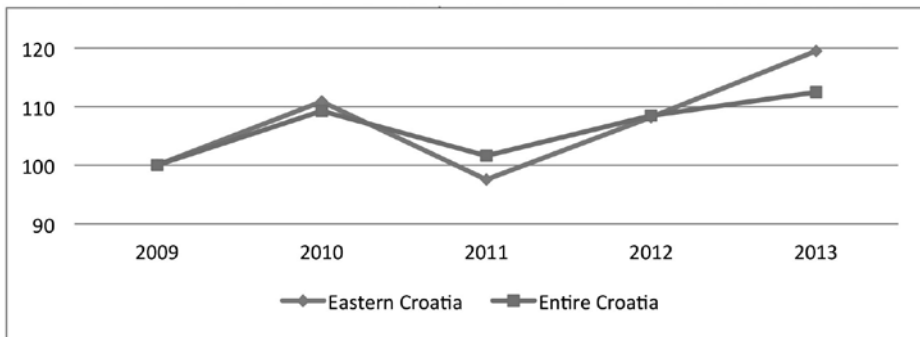
The paper will also explore how growth and development of this sector can be accelerated through the establishment of the association for promoting the ICT sector at the local level.

### 3. ICT industry in the narrow area of Osijek

The following text will present the analyzed statistical data on the situation in the ICT sector of eastern Croatian or 5 counties: Vukovar-Sirmium, Osijek-Baranja, Slavonki Brod-Posavina, Požega-Slavonia and Virovitica-Podravina, for the period from 2009 to 2013.

Graph 4 shows that the counties in eastern Croatia have a growth in companies in the ICT sector, especially Osijek-Baranja County in which the growth was the greatest, especially in 2013.

**Graph 6 Index of trends in the number of enterprises in the ICT sector in the eastern Croatia and overall economy, base = 2009**

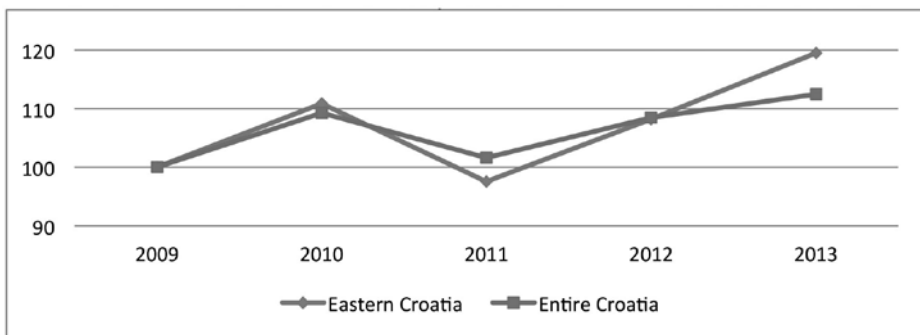


Source: created by the authors (according to the Croatian Bureau of Statistics)

The total growth of companies in this sector throughout eastern Croatia for a period of 5 years, amounted to almost 40% (259 enterprises in 2009 compared to 362 companies in 2013). At the same time, as mentioned previously, throughout the Republic of Croatia, the number of enterprises in the ICT sector grew by slightly more than 35%, so it can be concluded that in eastern Croatia, there has been a large increase compared to the national level.

However, the situation with the number of employees in the ICT sector is different. As can be seen in Graph 5, the number of employees in eastern Croatia, in almost all counties, is in decline.

**Graph 7 Index of trends in the number of employees in the ICT sector in the eastern Croatian and overall economy, base = 2009**



Source: created by the authors (according to the Croatian Bureau of Statistics)

If these data are compared with data in the sector at the national level, it can be concluded that the number of employees in eastern Croatia in comparison to 2009 dropped by 8%, while at the national level it has increased by 7%. This difference of 15% is very concerning due to the already poor economic situation in eastern Croatia.

Due to the volume of this paper, a thorough analysis of the causes of these discrepancies will not be carried out. However, based on available information, it can be assumed that most of the growth of this sector in the last 3-5 years (until 2013) for the most part takes place in and around Zagreb, where the most of the revenue from these activities is brought in. In the largest IT projects, whether public or private, where the system of public procurement requires references, fragmented ICT sector of eastern Croatia had a lot less chance of getting jobs.



In addition, the companies from Zagreb that opened their branches in eastern Croatia in times of crisis first started closing branches in less developed areas, and then those in developed areas. In addition, the number of products and services of the ICT sector (legal and physical) has been falling or stagnating more emphatically than in developed areas.

Taking into account the indexes of employment growth and the number of companies in the ICT sector at the level of eastern Croatia and the entire Croatia, as shown in Graphs 6 and 7, the growth indexes of companies are almost equal, while in 2013 a greater increase at the level of eastern Croatia was established, and it tends to increase, while the growth at the national level is somewhat lower. Indexes of employment growth in the last 3 years have had nearly the same path, but the growth was more pronounced at the state level.

Similar research was conducted by the association Osijek Software City (Kadić, 2014) in September this year. In their study they took into account only companies with limited liability from the Osijek-Baranja County with the activities from the group J 62 - Computer programming, consulting and related activities (NACE 2007). They came to the conclusion that the companies engaged in software development recorded during 2012 and 2013 excellent results and business growth, unlike most industries that have struggled with the recession. According to the same survey, in 2013, 30% more companies were opened than in the previous year. Furthermore, the number of employees increased by 16%. When comparing the period from 2008 to 2013, the number of enterprises engaged in software development was increased by 48% and the number of employees by 37%. In addition to new companies and employees, there was an increase in revenue (15%), export (4%) and profit (3%).

According to previous research from 2013 (Bilić, 2013), revenues from foreign sales for the period from 2008 to 2011 increased by as much as 460%. In the early years of the economic crisis, 2008 and 2009, most businesses and jobs were lost. Precisely because the only positive shifts were observed in export, companies began to direct the sale of their products and services abroad. Thus exports tripled in 2010 compared to the previous year, and in 2011 they increased by 460%, which is an excellent indicator, since export in this class grew by 64% in the entire Croatia.

#### 4. Osijek Software City project

According to the information available on the website (accessed on: September 10, 2014), Osijek Software City (OSC), started in 2012, is a project through which Osijek IT companies act towards the local community. In order to gather more detailed information on the initiation of the project, as well as the current situation, the interview was conducted with Nandino Lončar, the secretary of the association, as outlined below.

Osijek is a home to a number of IT companies operating successfully in the international market and companies that have managed to establish themselves as authorities in their business niches or are well on the way to becoming such. These companies hire experts, create high-quality software and export to many markets around the world. Just because some of them are oriented mainly or entirely on exports, they are largely unknown to the domestic market, although their performance is better than most other companies in our area.

The idea of starting the OSC initiative has been prompted by CISEx association<sup>3</sup>. Before launching the initiative, companies in Osijek were relatively independent; there was no mutual networking or cooperation. However, CISEx regularly gathered companies exporting software and in that way they mutually connected. The former members of CISEx from Osijek wanted to start a similar project in their city with IT companies from Osijek, and thus take the first steps. Although OSC is not designed as a cluster and from the very beginning an agreement has been reached between the initiator that companies will not jointly enter the market, the big advantage of this joint action is to create a positive atmosphere and to spread the story of the city of Osijek as a city with an enabling environment for IT companies.

A year after the launch and beginning of the activities, interest in joining the initiative grew, so the initiators of the project decided that the establishment of the association was the most practical way to make this possible. The initiative was started by four companies, while establishing the association there were seven, and today the association has 20 legal corporate members.

The objectives of the association are:

1. To increase the attractiveness of the first developer profession in Osijek
2. To increase the competitiveness of programmers on the market
3. To boost entrepreneurship in the ICT sector.

The greatest recognition of the association for the time being is still in Croatia, where the association has successfully established cooperation with companies from Zagreb, Rijeka and Metkovic. In the last few years, several major companies in Zagreb have opened their branches in Osijek, for instance, companies like "Five Minutes" and "Span" in November 2013, where they employed young Osijek IT experts. That Osijek is recognized in the wider region as the city of the IT industry has recently been proven by the established contacts with the IT profession in Mostar and Belgrade, where there is great interest for exercising a sort of a *spin-off*<sup>a</sup>. In Mostar, for example, the identical problem as it existed in Osijek before the founding of the association was noticed. Companies are mutually almost unfamiliar with each other, there is no cooperation and there is high unemployment of younger people, especially highly educated. For these reasons, the need to transfer knowledge and experience of colleagues has been developed in Mostar in order to initiate an identical project. Also, for small, new, unknown companies such IT environment is a good springboard at home and abroad, because experience has shown that business is more easily won by companies arising from well-known developer environments and positive competitive conditions.

Concerning the fact that in the Republic of Croatia a mismatch problem has been noticed between Croatian educational curricula, actual competencies and Croatian qualifications framework and the real needs of the labor market, the secretary of the association was asked about the collaboration with the academic community in Osijek. This cooperation is still in its early stages and currently it is reduced to certain common projects and support in using the premises of the faculties for various events and workshops. But the real, fundamental changes are taking place very slowly due to heavy bureaucracy in changing educational curricula and various state regulations. Since the very Faculty of Electrical Engineering in its Self-Evaluation (Galić R. et al., 2012)

states that "it is necessary to continue with the previous practice of continuous adaptation of existing programs within the 20% of allowed amendments, which applies especially to elective courses of graduates, and the legal provisions enabling flexible and faster changes in the program should be considered, because the current system of accreditation cannot respond to market needs in areas with such rapid changes, such as electrical engineering, and computer science in particular." However, the faculties of Osijek are determined to change and modernize the curricula to become regionally competitive and more attractive among prospective students. Within the cooperation, the introduction of student practice has taken place, and the aim is to give students a perspective of their potential (self)employment. The current implementation of academic programs and examples of technologically developed countries lead to the conclusion that it is necessary to (re)define learning, knowledge, skills and abilities of young people entering the labor market in all sectors that are required for (regional) development, including the IT sector.

Activities of the Association are reflected also in the organization of numerous free web design workshops, community management, programming, etc. One of the interesting projects is "Svašta-nešto o IT-u!"; during which a series of lectures for the high-school students was held, and the lecturers in this project (Puvaca, 2014) conclude that "the overall impression of lectures "Svašta-nešto o IT-u!" is that they found a fertile ground of highschool students who think about their future."

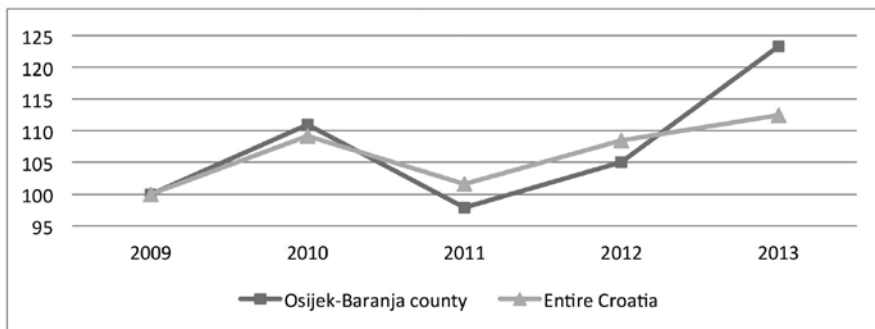
#### 4.1. Firms - members of the Osijek Software City

Current convocation of the Board of Directors consists of representatives from companies Adcon, BetaWare, Escape, Farmeron, Inchoo, Mono and Poslovanje 2, however, there is a total of 20 legal entities registered as members. Each of the companies in the current session of the Board of Directors has announced their starter kit, and thus any potential employee, but also all those who want to pursue IT business, can access information about knowledge, tools and technologies required for a career in the IT sector.

All companies on the list are engaged in creating software solutions for various activities (economics, agriculture, medicine, etc.) and web design, except for the company Escape that specializes in the field of web advertising with Google Adwords.

In almost all companies which are members of the Association there was an increase in the number of employees so it could be concluded that the association OSC had an impact on increasing the number of employees in IT companies, especially over the last two years during which the association has been active. However, this may be the result of a better overall business climate in the market, the obtained investments (e.g. Farmeron<sup>5</sup>) that enable companies to hire additional workers or expand the business to other IT activities. To confirm the hypothesis that the association Osijek Software City had an effect on these positive changes, it is necessary to make a more thorough research. It would be necessary to analyze the financial indicators of all companies, to talk to the directors of these companies, as well as employees who can answer the question of whether the association OSC in any way affected their employment in the IT sector.

**Graph 8** Index of trend in the number of enterprises in the ICT sector of Osijek-Baranja county and of the entire economy, base = 2009



Source: created by the authors (according to the Croatian Bureau of Statistics)

### 5. Assumptions for the future development of the local IT sector

Local IT sector is experiencing a growing recognition outside Osijek-Baranja county, but outside the Croatian borders as well. Creation of a positive business climate brought by the establishment of Business Incubator BIOS and by active role of the association Osijek Software City certainly favours the fact. Better financial indicators of enterprises in the ICT sector in the Osijek area and employment of young, educated people give a strong impulse to all those who are thinking of becoming entrepreneurs. This gives a hint that in the next few years the number of companies in the ICT sector will grow, so the employment will grow accordingly. The assumption is that domination of small businesses with up to 10 employees will continue. Institutions for education such as Josip Juraj Strossmayer University, will very soon have to improve the curriculum in courses related to information science and computing, as well as through programs of lifelong education, in order to adjust knowledge at faculties to the necessary/desirable skills in the labor market in the IT sector. It can be assumed that most businesses in the coming period will be mainly export-oriented, and given that export is one of the key elements of GDP<sup>6</sup>, it will have a positive impact on the development of this region. New challenges arise from the needs of the ICT sector within the European Union where there is a chronic shortage of ICT personnel. According to estimates from the end of 2013, the European Union by the end of 2015 will lack as many as 900,000 ICT professionals<sup>7</sup>.

From all of the above it can be clearly concluded that the establishment of the association Osijek Software City in a way contributed the recognition of IT companies from Osijek, but could it be credited for the increase in the number of companies in Osijek-Baranja County? From Graph 8 it is evident that companies in the ICT sector in Croatia, as well as those in Osijek-Baranja County, grew with almost equal intensity, but more significant change occurred just between 2012 and 2013. If it is known that the association OSC was launched as an initiative in 2012, and was formally established in 2013, there are indications that this particular event contributed to the growing number of businesses in the county.

## 6. Conclusion

This research shows that the disappearance of traditional labor-intensive industries after the war in 1990s, especially in eastern Croatia, caused a decline in GDP, closure of large enterprises with more than 250 employees, and an increase in unemployment. It resulted with opening of a large number of small, private businesses. In 2000s, due to more intensive development of the IT sector in Croatia, a large number of enterprises were established in the sector. However, the emergence of shredding of businesses has hit the IT industry, and thus most of them (over 90%) are small businesses with less than 10 employees.

Financial data for the last 5 years (2009-2013) were used in the research. It is evident that nowadays small businesses are prevalent, and growing in number, while large enterprises with more than 250 employees account for only 0.2% of the total number of enterprises in the sector. The number of employees has been growing steadily so that in 2013 it grew by 7% compared to 2009.

In order to better understand the importance of the ICT sector in the development of the overall economy, the indexes of employment growth in the sector and the entire Croatia were shown, which explains how the ICT sector in all 5 years records a growth rate of employment in relation to the total economy in which a negative growth index is present. In a situation when there is still a recession in Croatia and the number of employees is in constant decline, this is an excellent indicator meaning that the ICT

sector still generates new jobs.

If one observes eastern Croatia, a region that is less developed than the average, with higher unemployment and lower GDP, there are high expectations from the IT sector, as it has been observed above that the IT sector is the generator of new jobs and new firms. With regard to the period, there was an evident increase in the number of enterprises in the sector (especially in Osijek-Baranja County), especially in the last two years.

Certainly a major reason for this are the activities of the association Osijek Software City through which Osijek is represented as a city suitable for the development of the IT sector. However, according to the official statistics, the number of employees in this region in the ICT sector is in constant decline. The cause of this lies in the specifics of the industry. Many IT companies operate thanks to various projects obtained, so there are often fluctuations in the number of employees, or external staff, students and volunteers are employed instead. In the official statistics such employees are not registered. If one looks at the index movements in the number of enterprises in eastern Croatia in relation to the whole of Croatia, a trend of greater increase in the number of enterprises is visible, particularly in 2013.

Finally, it can be concluded that the association Osijek Software City has set good foundations for the future development of the IT sector in the narrow eastern Croatian (Osijek) area and that it influenced the recognition of Osijek IT scene, both in Croatia and countries of the region. It certainly contributes to strengthening the competitiveness and regional development. According to the data obtained after the research, it is evident that in the last two years in eastern Croatia there has been a growth in the number of companies, with the largest number in Osijek-Baranja County. For even better results, the key is cooperation between OSC association and the academic community in order to adjust study programs to the actual needs of the labor market in the ICT sector.

The results are the basis for future research on whether the companies in the IT sector will be the engine of economic growth and development and if the sector affects GDP growth in the region. By doing so, the research will be narrowed down to the IT sector exclusively (in this paper the whole ICT sector was observed), and it will encompass all IT companies in Croatia.

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**(ENDNOTES)**

- \* The paper was presented at the 35th Symposium Osijek – Pforzheim held at the Faculty of Economics in Osijek 16-17 October 2014
- 1 NACE 2007 (National Classification of Activities) has been in operation since 1 January 2008, and it defines areas, divisions, groups and classes of all economic and other activities. The European Community has introduced a statistical classification of economic activities under the abbreviated name NACE that began with the application on 1 January 2008.
- 2 A freelancer, freelance worker, or freelance is a person who is self-employed and is not committed to a particular employer long-term. These workers are sometimes represented by a company or an agency that resells their labor.
- 3 Croatian Independent Software Exporters (CISEx), founded in January of 2011 in order to gather Croatian software companies oriented towards global market
- 4 A by-product or incidental result of a larger project: a subsidiary of a parent company that has been sold off, creating a new company(Oxford Dictionaries).
- 5 More at: <http://www.netokracija.com/farmeron-osiguraa-2-65-milijuna-dolara-77167>
- 6 Gross domestic product (GDP) – the total value of goods produced and services provided in a country during one year (Oxford Dictionary).  $GDP = C + I + G + (X - M)$  where C is consumption, I is investment, G is government spending and  $(X - M)$  is net exports
- 7 More at: <http://eskills.hr/?p=1582>

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## **JAČANJE KONKURENTNOSTI KROZ IT INDUSTRIJU: SLUČAJ OSIJEK SOFTWARE CITY**

### **SAŽETAK**

Iako je istočna Hrvatska, koristeći svoja prirodna bogatstva i izuzetno dobar geografski položaj, bila industrijski vrlo razvijena prije nekoliko desetljeća, danas je jedna od najslabije razvijenih regija Republike Hrvatske. Potaknuto ratnim zbivanjima, tome je uvelike pridonio nestanak klasičnih industrijskih, proizvodnih grana (tekstilna industrija, industrija namještaja, prehrambena industrija i metalurgija). Otvaranjem tržišta i nestankom radno intenzivnih industrija, prepoznaje se potreba za promjenom razmišljanja, edukacijom i poticanjem samozapošljavanja.

Rastom ICT-a u svijetu, s jedne strane, te pojavom brojnih visoko obrazovanih i entuzijastičnih informatičkih stručnjaka, s druge strane, sve se više počela razvijati IT industrija – industrija u kojoj tržište nema granica, troškovi ulaska su niski, a prihodi relativno visoki. Kako se na užem osječkom području počelo pojavljivati sve više IT poduzeća, nekolicina osoba, većinom vlasnika takvih poduzeća, odlučila je 2012. godine pokrenuti projekt pod nazivom Osijek Software City.

U ovom radu bit će detaljno prikazan slučaj Osijek Software City-ja te njegov utjecaj na razvoj konkurentnosti ove regije. Ključna stvar OSC inicijative jest zapošljavanje mladih i obrazovanih informatičara budući da u regionalnoj IT industriji nedostaje kvalitetnoga kadra.

Za potrebe ovoga rada, bit će obavljen intervju s tajnikom Udruge koji će prezentirati rezultate rada od pokretanja inicijative do danas. Također, bit će prikazani i budući trendovi u lokalnoj IT industriji.

**Ključne riječi:** IT industrija, Osijek Software City, zaposlenost.