Munk, Andersen & Feilberg

Software Development in Ukraine

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The offshore Software Sector in Ukraine – A Special Focus on Western Ukraine

An overview of the software sector

Western European and U.S. software developing companies have since 1995 faced an increased pressure from the market to reduce their development costs significantly. At the same time, some of these companies are faced with a growing lack of well qualified programmers and as a consequence, an upward pressure on salaries. In order to cope with these two problems, software companies have started to outsource tasks to specialists and software companies in Southern Asian and now also Eastern Europe. For some time and perhaps by tradition India has become the leading country in this field.

There are several strong characteristics of Ukraine, which provide benefits for international companies that consider dealing with software development resources from Ukraine. The Ukrainian software sector is one of the few sectors in the economy, which has not experienced a crisis as a consequence of the break down of the Soviet Union. Industry insiders believe that this sub sector of Ukrainian economy is growing 30-40% annually. Ukraine is emerging as a low cost site for high quality software development.

The offshore programming industry is growing very fast. Due to the restrictions in society and especially due restriction in relations with the West, the software sector in Ukraine was underdeveloped until late the 80's. At that time the software and computer resources were only used for military or scientific purposes and had very little applicability in everyday life and were definitely not targeted for commercial use. Gradually, the software sector was redirected to commercial utilisation, especially towards customised accounting systems and databases development. Commercialisation and applicability of programming resources was first introduced and developed after 1991. In the early 90' the sector suffered a backlash in the form of a brain drain. At that time the best qualified specialists and programmers found a job abroad or immigrated to the US, Canada or Western Europe.

In Ukraine, the large competence centres for software development are Kyiv, Kharkiv, Dnipropetrovsk, Odessa, and Lviv. Most software companies have experience with subcontracting for European or American companies, e.g. working for customers such as Boeing (BA), DaimlerChrysler (DCX), General Electric (GE), Citibank (C), and NASA.

Level of Competence

Over recent years Ukrainian students and school programming teams have consistently beaten their competitors from all over the world in closely watched international competitions. Ukraine is the fourth in top 10 countries with the most certified IT professionals according to Global IT IQ Report by BrainBench, 24,300 specialists from Ukraine have got the certificates of BrainBench. Only India, the USA and Russia are ahead of Ukraine in this issue.

Western specialists active in the sector often state that the main advantage of Ukrainian programmers is that many students get during their studies rather wide and strong fundamental education in IT-related fields. This comes from the essence of Ukrainian education: such knowledge enables them to easily master most particular technologies in very short terms. Unlike many Indian programmers, which are often taught some particular technology at short specialised courses, and thus cannot solve problems that arise outside the scope of their knowledge, Ukrainian programmers are usually educated enough to work on nonstandard challenges; they are therefore also able to change development platform, technology, etc relatively easy. Technology wise, virtually all technologies used in the West are also in use in Ukraine. All the latest worldwide technical literature is available in Ukraine. Today the Ukrainian programmers possess all required up-to-date technical skills.

Knowledge of foreign language and cultural traditions is necessary for successful interaction with foreign customers. Almost all employees of 40 leading Ukrainian companies speak fluent English.

Education and human resources

In a historical perspective the first computer in continental Europe was build in Kyiv in 1951, which was a main centre of the Soviet programming industry. The Soviet Union and Ukraine, as a part of it, managed to organise the educational system on a very high level, enrolling most of the population. Special focus was paid to the exact sciences such as natural science and mathematics. Ukraine has approximately 1% of the world's population, but 6% of the world's physicists, chemists, mathematicians, biologists, computer programmers and other highly trained professionals. After the U.S., India, and Russia Ukraine has the fourth largest number of computer programmers in the world.

Even though the educational system is now suffering from under-funding, Ukraine continues to possess considerable intellectual potential with its Ukrainian National Academy of Sciences, numerous scientific and technological institutes and universities. Ukrainian scientists have achieved world-class results in such fields as mathematics, physics, computer sciences, biology, electric welding, new materials and space sciences. As an example it could be mentioned that Ukraine is producer of the biggest cargo plane in the world "Mriya" and one of the best brands among space launchers "Zenith".

In Western Ukraine, Lviv is the only, but very interesting centre for computer technology and software development. This region is especially interesting because it has a large, relatively cheap, and easy assessable human resource potential. Lviv is the economical, cultural, and intellectual capital of Western Ukraine; it has Universities and other educational institutions with specific focus on computer science and software. Lviv has the region's largest and best-consolidated software houses, it has a sufficient and available human resource base for software development and it has the best communication infrastructure in the region. Furthermore, Western Ukraine is known to be culturally closer related to Western Europe than the Eastern part of Ukraine or even Russia, which is likewise very important when managing development projects. Finally, the cultural affinity to Western Europe has proven to be an important factor when achieving efficiency through management. To sum up, Lviv is an interesting target for Western software companies because it still has an unused and available resource of software competencies.

Leading educational institutions in the field of software and/or hardware development in Western Ukraine are concentrated in Lviv. These are:

- Lviv Polytechnic Univercity (www.lp.edu.ua):
  - Institute of Computer Science and Computer Technologies (211 graduates in 2007)
  - Institute of Applied Mathematics (93 graduates in 2007)
  - Institute of Computer Technologies, Automation and Metrology (371 graduates in 2007).
- Lviv National University (www.franko.lviv.ua):
  - Faculty of Applied Mathematics and Computer Science (178 graduates in 2007)
  - Faculty of Mechanics and Mathematics (110 graduates in 2007)
  - Department of Economic Cybernetics (60 graduates in 2007).

In total about 1023 students per year 2007 with relevant education are graduated from Lviv educational institutions.
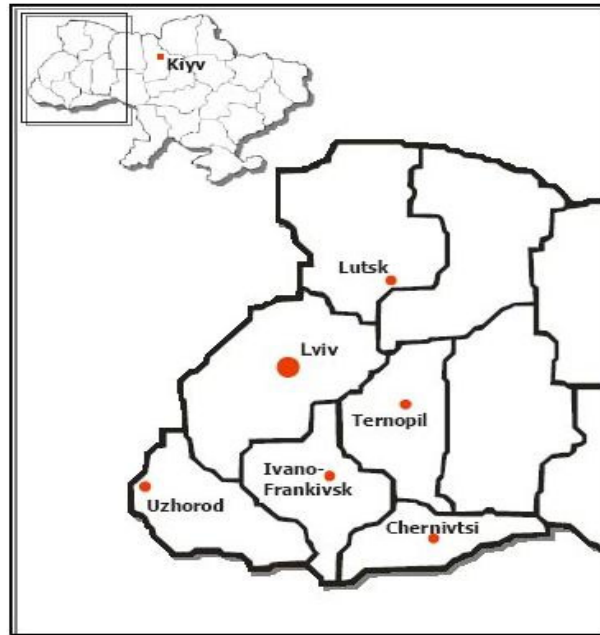
Number of graduates in the coming years will increase, as all mentioned above institutions have increased number of students accepted during last years. For example in 2003 the institutions accepted about 765 students against 1023 in 2007.

Part of them has deep fundamental education directly related to software development, and part has either IT-related knowledge, or good scientific capabilities.

At least 400 graduates after vocational training can be accepted as programmers.

Other institutions, that prepare the IT specialists in the region are:

- University of Oil and Gas (www.ifdtung.if.ua) in Ivano-Frankivsk Oblast
- Lutsk University (www.univer.lutsk.ua) in Volyn Oblast, Faculty of Mathematics and Informatics
- Zakarpattya University (www.univ.uzhgorod), Faculty of Mathematics
- Chernivtsi University (www.chnu.cv.ua), Faculty of Mathematics
- Ternopil State University.

To evaluate number of people available for new company on the market, it is essential to analyse distribution of former students on the market.

At the same time there is significant number of people working either unofficially through the Internet (mostly simple web-projects), or in business support sector (system administrators, accounting software customization teams). Brain drain still has place in Western Ukraine: number of good programmers move to Kyiv, or even to the EU or USA.

As a summary about 400 people each year are accepted by software companies, while the rest do not suit for work in a foreign company, come back to places, they are originally from after finishing of their studies or work in IT-related fields which do not require special skills, and therefore still are available for new coming company. Decision of graduating students where to work as usual depends on salary level and kind of work.

Local software developing companies began to look for possibilities for cooperation with educational institutions couple of years ago, when their staff grew considerably, and problem of inflow of qualified specialists aroused. As for today, Faculty of Applied Mathematics and Computer Science (Lviv National University) reports to have specialized computer laboratory established by Eleks. This laboratory serves as educational, developing, and personnel selection basis.

Apart of graduates, some prospective students remain at the universities to develop their thesis (PhD status). These post-graduates considered as a future teachers/professors at the universities. Part of post-graduates work on their thesis at the universities as their main full time job and another part of post-graduates work on their thesis as distance education having the full time or part time job at the IT companies or working independently.

Training Facilities

In Lviv there are such IT training centres:

- SoftServe University (prepares up to 150 specialists per year)
- Eleks Training Academy (since 2000 till nowadays 79 persons have received training)
- Lohika Training Centre (prepares up to 30 specialists per year)
- Computer Academy "SHAG".

The mission of these training centres, except Computer Academy "SHAG", is to get new employees for the companies, but after finishing the training course every student can choose to stay working in that company or not.

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Companies' number of employees is from 10 to 500 people. Average number of employees in 40 leading companies amounts to 79 people. The majority of companies have between 20 and 50 employees, with only a few firms having 250 or more. Many of the registered companies employ five programmers or less. In Lviv the best known Ukrainian-owned companies are SoftServe (www.SoftServecom.com) with more than 900 programmers, Eleks (www.eleks.biz) employing about 250 developers, Lohica Systems, Inc. (www.lohika.lviv.ua) employing about 400 people and DevCom (www.devcom.com) with about 50 employees. During less than 2 years number of employed programmers in Lviv has doubled; at the moment, software companies employ about 2000 software specialists in Lviv city. Another 800 people are employed as "computer specialists" in companies not directly involved in software development, such as insurance companies, banks, energy providers, dispatchers, automation departments of equipment sellers, etc. Altogether, about 4,000-5,000 specialists are working in the software sector in Western Ukraine.

Labour costs

The single most important reason given by companies for entering the Ukrainian software sector is cost savings on development projects, and in this respect Ukraine offers access to vast IT resources at the cost of approximately 10%-20% of an American or European IT engineer.

In the 90's a fairly good salary for Ukrainian software specialist was around €55 a month. Parallel with the positive development in the sector and the rising demands for the best qualified candidates the standard salary has risen significantly.

In Ukraine all official salaries must be paid only in national currency with possible reference to any foreign currency due to exchange rate of the National Bank of Ukraine. In spite of the fact, that UAH is linked to USD, paying equivalent in Euro is really a direct

advantage to an employee compared to other companies, who maintain their salary agreements in UAH or USD, because of permanent growth of EUR as compared to UAH. But the choice of the currency equivalent depends on the employer decision.

The information about salary level of Ukrainian IT specialists was received from the web-sites which represent the statistics for the last years. Important to take into account that salary level in Kyiv is higher than in Lviv. Average figure for Lviv area is added by Munk, Andersen & Feilberg, due to information received from 4 (four) well established IT companies in Lviv.

The initial net salary for programmer in Lviv is around USD 300 per month. However, experienced specialist will expect to get USD 600-1,000 per month. The salary level for an experienced local project manager is USD 900-2,200 per month.

Table below shows different salary levels in Ukraine.

Monthly Salary in USD ("in hands", after taxes) for Ukrainian IT Professionals[1] in 2007

Position	Average in Kyiv[1]	Average in Lviv[2]
Junior Developer	500	300
Developer	1,000	800
Senior Developer	1,450	1,200
Project manager	1,800	1,500
Development manager	4,000	3,500
System administrator	1,400	1,000
Tester	800	600
Web developer	1,000	800

Intellectual property and copyright protection

Ukraine is a party to two main conventions protecting copyright: Berne Convention for the Protection of Literary and Artistic works and Universal Copyright Convention, which are effective in Ukraine.

Protection of intellectual property in Ukraine is a hot issue for the country, especially taking into account that Ukraine became a member of WTO. Questions about Ukraine's inability to protect intellectual property rights have been brought up very frequently during the recent years by United States. Accusations were primarily related to production of illegal CDs on Ukrainian factories. Actually the problem laid more in import of pirate goods into Ukraine, rather than in their production. However, during last years Microsoft and other software importers reported strong sales growth, which might prove Ukraine's crackdown on software piracy.

Relations concerning protection of intellectual property are regulated by different codes (Civil, Commercial, Criminal and Customs codes of Ukraine, etc.), laws ("on Copyright and Related Rights", "On distribution of audio, video works, computer programs, data bases", etc.) and numerous by-laws.

From the perspective of a foreign firm looking into the possibilities in Ukraine there are kinds of copyright infringement that are perhaps more pertinent than unauthorized

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1 Source: http://www.developers.org.ua/salary-db/data/salary-by-year/2007

http://www.itacademy.com.ua/job/info/salary.html

[2] Munk, Andersen & Feilberg's estimation

copying. Here different kinds of industrial espionage are most on the minds of independent software developers. But such risks are likewise important in any other country, as the end product is costly on development but easy and costless to copy and distribute.

Foreign involvement in the software sector in Western Ukraine

During last years number of Western companies that have already benefited from possibilities in this region has increased dramatically. Among companies active in the city there are American Lohika Systems, Inc. (www.lohika.com), Israeli SoftObject (www.softobject.com.ua), German N-iX (www.n-ix.com), Spanish Grupo Delaware (www.grupodelaware.com) and Ulybin (www.ulybin.com), Danish Mita-Teknik (www.mita-teknik.com). These companies alone are employing about 450 specialists on a full time basis, plus subcontracting up to 100 specialists on a freelance basis. Not only do these companies develop software offshore, but they are also active on the local market providing services to Ukrainian customers. It is expected that the number of foreign companies in Lviv will continue to grow in the years to come. The other centres for software development – Kyiv, Kharkiv, Odessa and Dnipropetrovsk – have already reached a critical mass of software companies, putting an upward pressure on salaries. This situation is still to be seen in Western Ukraine.

How to utilise local resources and competencies

Basically, there are two approaches towards cost efficient software development:
- to outsource processing activities to local companies in low cost areas
- to establish own production or development unit in low cost areas

The approach chosen in the final end is often a question of corporate strategy, production volume, market estimations, financial abilities, and management skills in the western company. From a risk point of view the first option puts the business idea at stake whereas the second option is a financial risk mainly.

When only considering the financial aspects of the choice between outsourcing to an external partner and establishing own development unit in Ukraine the decisive factor is the amount of programmers to be involved in the project. Based on the market during the last years the break-even point seems to be around 10 specialists. With less than 10 specialists employed full time it will be cheaper to outsource the tasks than to establish own development unit. But in the strategic perspective there are more to it than a simple "visual-cost-calculation".

The market for specialised software for the public sector organizations, such as Ukrainian railways, energy distributing companies, etc. is growing rapidly, as these are adapting to the competition and expectations in the market.

E-commerce is in its initial stages. The lack of well proven and secure payment systems in combination with a low PC and Internet penetration in Ukraine are the major obstacles. To be sure, the market for software and related services in Ukraine is still limited. Based on a population comparable to France and a fast growing market economy, the potential is huge.