

Oleg Ishenko

Outsourcing Of Software Development

**Humboldt Universität zu Berlin
Wirtschaftswissenschaftliche Fakultät**

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Abstract

This study describes the outsourcing of software development. It examines the origins of the software outsourcing and analyses the key motivation and the major risks of this practice. The paper focuses mainly on the offshore outsourcing and gives an overview of the major offshore outsourcing destinations. The paper also analyses the current state of the software outsourcing and presents a set of factors, which will influence its further development.

Keywords:

Software development, outsourcing, offshore, near-shore, in-country outsourcing, insourcing.

Abbreviations:

OSD - outsourcing of software development.

IRP – intellectual rights protection

IP – intellectual property

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Introduction

The subject of this paper is the outsourcing of software development, which can take place either in one country, when an outsourcing provider serves its clients within national borders; or when clients look for an outsourcing provider abroad. This paper will focus more on the latter – the offshore outsourcing of software development (OSD). This category is also frequently referred to as outsourcing across borders.

In the first part I will present a historical overview of the OSD in order to identify its origins. I will present a general definition of the OSD together with definitions of its three components: in-country, offshore and near-shore outsourcing

In the second part I will present the factors and advantages that motivate companies, both providers and clients, to enter into the outsourcing relationships. I will examine those factors separately from clients' and providers' perspective.

The third part is devoted to a discussion of the problems that arise in the outsourcing projects. I will identify and describe possible risks in the OSD.

The fourth part starts the main topic of this paper – the offshore OSD. First I will present the criteria, which should be met by the countries – outsourcing destinations. Then I will examine countries which are currently considered as major outsourcing destination. I will support the descriptions with the figures of the past and current software exports, employment resource, salary ranges and tax rates. I will also consider the situation in the IT industry in two possible future outsourcing destinations - Ukraine and Kazakhstan - and try to make conclusions on their chances to enter the global outsourcing market. Finally I will present an example of a near-shore destination – Canada.

The fifth part discusses the current state and trends in the OSD. I examine modern tendencies in the global outsourcing competition and present key features that will define and shape the OSD in the future.

This papers ends with some general conclusions. I tried to generalize the knowledge contributions made by this paper and identify the questions of the future research.

1. OSD: Origins and Definitions

In the modern society of knowledge and technology the IT industry has become one of its essential parts. Information and communication technologies now are integrated in every business across the globe. The key element of these technologies is software, which makes software production and implementation exceptionally important. In the early ages of computing software development was considered as an internal affair by the most of the technology firms. Those companies tended to have their own development departments producing software for the interior needs. This approach is known as '*in-house development*'. On the other hand there were a number of companies that have rejected the idea of the in-house development and turned to specialized companies buying software from them or contracting out the development work.

Why is the in-house development so unpopular? Starting from the age of the big mainframes to the late 1980s the companies that used to run their own software development departments have experienced an unprecedented growth in their developer staff – in hundred times. Jones (1994) points out that by that time City bank and Athena Insurance employed more than 3000 software personnel, Pacific Bell – 5000, AT&T and IBM – more that 20000 each. The US federal government agencies had more that 150000 software employees [7]. The software industry in that period was immature and software products available on the market often lacked flexibility to be successfully implemented in the heterogeneous mainframe systems landscape. This made the companies and public bodies to increase their development teams. However by the late 1980s the scale of the software usage in the business and also the complexity of the software systems have grown dramatically and caused a corresponding increase of the developer staff. Companies have faced a dramatic escalation of salary expenses coupled with increased spending for establishing complex infrastructures required for the software development processes (such as specialised premises with air conditioning for data-centres or networks). Efforts to provide an effective management of the development projects also were considered to be too excessive for a company, which primary activity was not the software development. All these factors decreased return on the investments into the in-house development.

By 1994 the contracting out work has become an increasingly popular practice for software development, maintenance of the entire IT infrastructures, since it helped to avoid excessive spending and managerial efforts. In the IT industry the 'contracting out' term is widely substituted with 'Outsourcing'. The common definition of the outsourcing given by Wikipedia¹ is: "the management and/or day-to-day execution of an entire business function by a third party service provider."

¹<http://en.wikipedia.org/wiki/Outsourcing> (accessed 01.07.05)

In the case of software outsourcing the business function is the software development and a third-party service provider is a subcontractor enterprise. So, a more precise definition for this practice is given by R.Abbas et.al (1998): “*software outsourcing is contracting out the development, planning, management, training, maintenance or operation of software services, skills, products or applications*” (11)

During the 1990s the software development outsourcing not just replaced the in-house development but also became one of the fastest growing industries. For example, the value of the North American (USA and Canada) IT outsourcing² market had value of \$101 billion in 2000 and is expected to reach the value of \$160 billion in 2005 [13]. The global IT outsourcing market volume expected number in 2005 is \$208 billion (1).

The IT outsourcing market consists of two main parts. One of them is the *in-country outsourcing*, which are the outsourcing contracts between companies within a country. The first outsourcing attempts have been in the domestic market. It was the natural course of the outsourcing. The domestic market is full of the companies ready to offer clients their services in the software development, maintenance and those of the other parts of the software life-cycle. These vendors are geographically and culturally close, easy to contact and to deal with.

Another part, which constantly increases its share, is so-called *offshore outsourcing*: “*the practice of hiring an external organization to perform some or all business functions in a country other than the one where the product will be sold or consumed.*”³ Until the late 1980s the disadvantages of the international outsourcing contracts (e.g. communication and managerial complications) have been prevailing over their advantages (low wages). The breakpoint was in 1985 when Texas Instruments first saw potential and, in a pioneering and landmark move, established their subsidiary in Bangalore, India [14]. Since that time offshore outsourcing of the software development started to attract the attention of many companies. One of the main reasons to that was the globalization. Globalization has increased the competition in the IT industry which made such factors as cutting costs, accelerating market delivery, use of highly qualified personnel, increasing quality of service, proximity to customer and getting access to the new markets extremely essential. The offshore outsourcing projects made it possible to achieve these goals. Besides, IT industry, especially the software development well fits such requirements of the offshore work as ability to perform the job distantly, high information content of the job, high wage difference between the original and offshore countries and the repetition nature of the work⁴. And finally the rapid development of the ICT, especially networking (the Internet) has enabled a big number of small companies, even individuals to perform the offshore software development at minimum cost.

²Including software development, ASP and other IT services.

^{3,4} http://en.wikipedia.org/wiki/Offshore_outsourcing (accessed 01.07.05)

All these factors have made the offshore outsourcing of the software development a popular trend among many companies both in Europe and North America. The value of the offshore IT outsourcing in the North America in 2001 was \$5,9 billion and will reach \$15 billion in 2005 – 9,4% share of the total IT outsourcing market.

Finally, another practice, which is considered to be free of such natural imperfections of the offshore outsourcing as for example cultural differences, is *near-shore outsourcing* – a new term to describe outsourcing work in countries which culturally and geographically are close to the outsourced company's country of origin. The examples are Canada for the USA and Ireland for the UK.

2. Key Drivers for OSD

Riabov (2003) points out a number of key drivers, which impel both client and vendor companies to start outsourcing projects. They are:

- Increased revenue potential,
- Selling capabilities to external users,
- Increased process effectiveness,
- Freeing up internal resources,
- IT function difficult to manage,
- Company philosophy of outsourcing non-core activities,
- Lack of appropriate skill set,
- Reduction/control of costs,
- Gaining access to world-class capabilities

The increased revenue potential factor is considered to be more important to the provider rather than to the client. Software development companies can significantly increase their income by entering the OSD contracts in addition to the production software for the market. For clients this is less direct. By establishing an OSD contract, clients can avoid excessive spending on establishing their own internal software development infrastructure, free up resources and concentrate on his primary activities.

Ability to sell capabilities for the external users is again more important factor for providers. Companies developing software possess a valuable expertise and solutions ready to be realised in a wide range of software projects which can correspond to specific needs of new clients.

Increased process effectiveness – for clients it means first of all that the processes of the development of software as well as maintenance and other part of the software life-cycle are run by professionals of a company, which is specialized in this kind of work. This allows avoiding many of organisational, marketing and managerial mistakes which are common in the software development. As a result the product development time is reduced. For providers concentrating on the OSD allows developing patterns for work with external clients, refining them to a maximized effectiveness and applying repetitively with some adjusting in the further contracts. This results in a decrease of the consumer order cycle time.

Ability to free up internal resources: clients can direct enormous resources usually required by the in-house development to other activities. Provider in turn is free of efforts to promote and deliver a specific software product to the market, which is usually a more difficult process than advertising development services, it allows to concentrate on the core activities of the software development.

IT function difficult to manage: software development projects have some specific features that make them extremely difficult to supervise. This work requires a deep and up to date technical knowledge, which is lacked by the most business managers. Due to this discrepancy a lot of software project failed in the past and continue to fail now.

Company philosophy to outsource non-core activities: with the increasing popularity of the business process outsourcing (BPO) many companies have accepted a practice to contract out some of the non-core activities, and concentrate on the primary business processes.

Lack of appropriate skill set: this is a factor of an increasing importance. “The IT skills shortage is an international issue which is particularly affecting western European and US companies”. [12] In Germany, for example, the number of programmer vacancies estimates for the period on 2001-2005 is 210 000. [12] Roughly 30% of them can be filled.

Reduce/Control costs: is considered to be the most important factor influencing the decision to start an OSD contract. Client is free of the most of fixed costs of the software development. Provider in turn especially in a case of offshore OSD is able to lower cost due to lower wages, corporate tax rate, rent expenses etc.

And finally, the *access to the world class capabilities* – even small businesses through the OSD are able to get a world class quality, since providers due to increased competition caused by growing globalization, tend to provide high quality software development services which correspond to the international standards. “International outsourcing provides better quality service. Service providers specialized in a specific service such as Java programming language, web-based development, etc, and they are often more skilled than the general IS department of the firm buying the service” [15]. Provider gets an advantage of increasing its capabilities by getting new knowledge from the client,

from its practices and experiences. Especially in offshore contracts, when client resides in a developed country with a well established base of research and development. [15]

3. Key Problems in OSD

Outsourcing of software development has a number of specific risks that can influence the decision of entering into an OSD contract. First of all is the:

Uncertainty about information confidentiality. This is a problem of a growing concern. The first thing that provider tends to assure a client in is the secure handling of essential information about client's core business process. Unfortunately providing a total security is difficult task. A simple example: a developer sends files with the source code to his private mailbox on the Yahoo server to work on them at home. Such a security breach can ruin an entire contract, and still it is difficult to foresee and prevent.

Lack of proximity to staff. In a case of an in-house development, the developers' team has constant and easy access to all the employees involved in the future use of the software. In a case of OSD, especially offshore OSD it is necessary to prepare detailed technical requirements and constantly adjust them to any change. This creates an excessive managerial and technical overhead and decreases quality of the future product.

Uncertain financial payback. While the provider can have some guarantees of his cash flow set by contract conditions, the client is uncertain about the payback on the product. The delivered software can meet all the technical requirements, and in the same time it might turn out to be obsolete, or do not support some important technologies and standards that appeared during the development period. A sudden bankruptcy, changes in local or foreign legislation, political instability and other factor endanger provider's income as well.

Increased complexity of management. Outsourcing is considered to be a solution to decrease complexity of management of the IT functions. But often management of OSD project suffers from a lack of control, namely the futility of implementing tightly controlled operations in such projects [14].

Finally, *the lack of control over the outsourced resources.* A situation when provider has to develop a software that will be used over a heterogeneous IT infrastructure of a client composed of a variety of devices, legacy systems, which cannot be replaced or upgraded by the contractor's will. This creates specific technical challenges that can reduce outcome of an OSD contract.

4. Offshore OSD

During the last decades a new phenomenon called Globalization is considered to be the cause for a number of fundamental changes of our lives. Changes that have introduced such terms as ‘new economy’, ‘network society’ or ‘the information age’ also have roots in globalization. In international business environments these changes are especially visible in the kind of *organizational forms* being adopted to enable work across the globe [14].

Offshore outsourcing of software development can be described as “a relatively long-term inter-organizational relationship established between the outsourcing organization (the outcomes) and the outsourced organization (the contractor) based in different countries to enable software development in both real time and asynchronous time” [14].

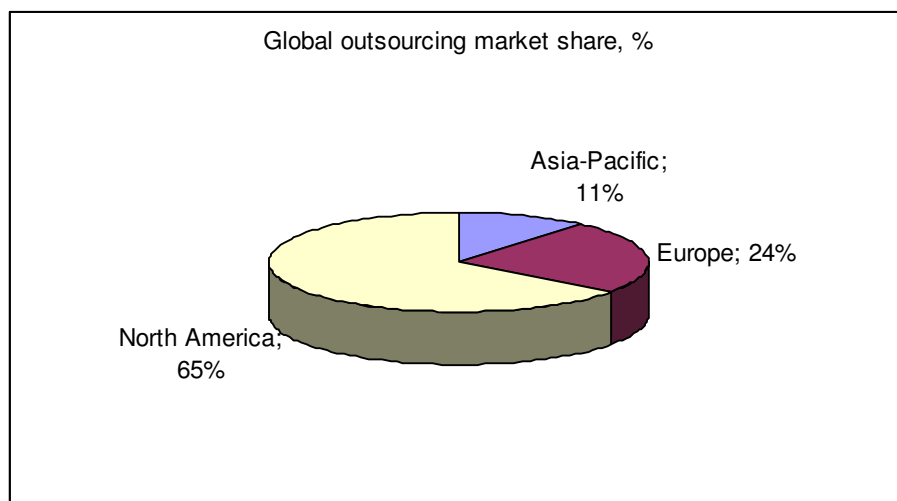


Figure 1. Global outsourcing market shares. Source: Riabov (2003)

According to Riabov (2003) the main consumer of the offshore IT outsourcing is North America, with a share of 65%, Europe consumes 24% of the market, while Asia/Pacific region (especially Japan) 11%. The North American dominance in the consumption of the offshore OSD has influenced the set of the criteria for countries-candidates to host OSD projects. According to Nahar, N., Käkölä, T. and Huda, N. (2002) these requirements are:

- Availability of well-educated, trained, experienced and English speaking software programmers and engineers, quality assurance engineers, and software project managers;
- Low salary of software professionals and low production costs;
- Availability of functioning infrastructure: telecommunication lines, Internet, electricity;
- Existence of effective intellectual protection law;
- Favourable government policy and support for software production, low tax;
- Political stability;
- Economic stability;
- Geographic location, and cultural affinity;

The current conditions show that neither of the current countries – OSD-providers fully meets the entire set of these requirements. Further each of those countries will be considered in regard of the requirements given above.



Figure 2. International IT outsourcing.

4.1 India

India is considered as one of the leaders of the offshore software development. As an offshore location it first was discovered by Texas Instruments, which has been running a subsidiary in Bangalore starting from 1985. The exceptional annual growth of software exports of average 40% during the 1990s has promoted India to one of the top software exporters. According to NASSCOM (India's National Association of Software and Service Companies) software and service exports in India have reached a value of \$12 billion in 2004-05, 34% higher than \$9.2 billion in 2003-04.[8]

India has become a favourite place for North American companies to start their OSD projects. In 1992 a Motorola's subsidiary in Bangalore has achieved the highest quality rating becoming the second one to get Capability Maturity Model Level 5 (the other one in the world was IBM) [14]. By now 265 companies of the Fortune 500 have established joint ventures, fully owned subsidiaries or signed on-site body-shopping contracts with Indian firms.

A distinctive feature of Indian OSD is so-called 'body shopping', namely moving the developers on-site for the entire length of the project. This trend has been degrading through the 1990s: while in 1990 95% of the outsourcing work was done on-site, by year 2000 70% of the project now are made in India.

India has a unique resource of highly trained IT professional, which second language is English. "Every year, approximately 19 million students are enrolled in high schools and 10 million students in pre-graduate degree courses across India. Moreover, 2.1 million graduates and 0.3 million post-graduates pass out of India's non-engineering colleges"⁵. "The Indian education system places strong emphasis on mathematics and science, resulting in a large number of science and engineering graduates. Mastery over quantitative concepts coupled with English proficiency has resulted in a skill set that has enabled the country to take advantage of the current international demand for IT"⁶

Offshore OSD receives a constant support from Indian government, which understands the role of the IT industry in the future economical and intellectual development of the country. Indian government runs a number of deregulation and liberalization initiatives, which result in less restrictive license requirements, facilitation of foreign investments processes and introduction of laws supporting intellectual property.

The corporate income tax effective rate for domestic companies is 35% while the profits of branches in India of foreign companies are taxed at 45%. Companies incorporated in India (any setup other than a branch) even with 100% foreign ownership, are considered domestic companies under the Indian laws.⁷

The salary level in the Indian IT industry has increased since the early 1990 but still is low compare to the North American or European wages. Entry-level workers in India earn an average salary of \$5,443 and midtier workers about \$8,400, while experienced managers pull in roughly \$13,100. [10]

^{5, 6} http://www.nasscom.org/artdisplay.asp?cat_id=36 (accessed 01.07.06)

⁷ *Business Opportunities in India - Tax and Legal Issues* http://www.outsource2india.com/why_india/articles/business_opportunities_legal.asp accessed 01.07.06

In the early stages, the lack of infrastructure had a negative effect and made some companies, such as Texas Instruments to establish technology 'islands' in their premises. TI for example has obtained a permission from the Indian government to mount their own satellite antenna to set communication to its US headquarters. While nowadays certain areas in India still lack the basic infrastructure such as reliable communication lines and even electricity, the technology centers such as Bangalore, Mumbai or New Delhi has communication infrastructure of highest quality.

4.2 Ireland

The second world's largest software exporter after the USA is Ireland. Ireland's software exports have grown from an estimated US\$4 billion in 1998 [14] to €14 (\$18,2) billion in 2003-2004. Ireland has a number of strong advantages that have promoted this country to its current leadership position. They are: EU membership, highly developed infrastructure, low taxation, the government's active economic policy, English-speaking manpower, strong educational system and proximity and cultural similarity to the UK and the USA [14].

The first foreign company to establish a subsidiary in Ireland was Microsoft, which in attempt to reach UK and European markets has opened its new location in Dublin in 1985. Now Microsoft's Dublin subsidiary employs over 1200 people. Over 1000 companies, 200 of them foreign now operate in the Ireland's IT market being almost fully oriented to the offshore work. Naturally 3,7 million population of Ireland cannot constitute a solid domestic market for such a big number of players. 200 foreign companies generate 90% of the Irelands software industry [5].

As in India the government provide exceptional support for the Ireland's software industry. Ireland has one of the lowest corporate tax in the world 12,5%. Coupled with highly competent English speaking professionals, legislation on security and copyright as well as funding for research and development (R&D) Ireland has become extremely attractive for chip-makers like Dell, Hewlett-Packard and IBM [14]

Ireland wages are higher than in Asian or Eastern European countries, but still 15% to 30% percent lower than in the neighbouring UK. The entry level for a programmer is about €16000, mid-tier €20000-30000, experienced professionals from €30000.

4.3. Israel

Israel is one of the oldest locations for IT outsourcing. Israel's IT industry has started to develop immediately after the establishing of the new state in 1948. In 1964 Motorola opens its first subsidiary in Israel. The main contribution to the Israeli ICT is made by a large number of highly trained military computing specialists starting civilian career after the army. This trend continues today. Starting from 1990s Israel sets up high-tech clusters attracting venture capital from abroad linked to the high tech clusters in the US, Europe and Asia [14]

Israeli software exports have constant growth: from \$110 million in 1991 to \$600 in 1996 and to \$3000 in 2004.⁸

The success factors of Israeli software industry are high research and development spending, large proportion of highly educated population, especially with technical background, large expatriate Jewish population abroad, especially in the USA providing direct contact to bankers and investors in the West, developed telecommunication infrastructure [14]

By numbers of software exports Israel lags behind India and Ireland, but still promises to achieve a position equal to these leaders. Israeli software industry primary focus is software products, which differs it from the Indian IT industry mainly oriented to providing IT services. Besides Israel has a close geographical and cultural proximity to Europe and North America. On the other hand recent political events in Israel as well as potentially dangerous situation around the Palestine State create concern among possible clients and investors.

The entry level monthly salary for an Israeli computer programmer is NIS12000 (\$31296 per annum), the upper limit is twice as much – around NIS 24000 (\$62592) which still is lower than in the USA⁹ The corporate tax in Israel is among the highest in Europe and constitutes 34% in 2005. The Israeli government runs a graduate reduction of this tax. By 2007 it will be 30%¹⁰

⁸ *Israeli Software Newsletter, June 2004* <http://laniado.sweethome.co.il/files/export/software/2/software.htm> accessed 01.07.05

⁹ *How to succeed in high-tech without really working. Ha'aretz - Tuesday, October 13, 1998* <http://www.cji.co.il/cji-n038.txt> (Accessed 01.07.05)

¹⁰ *Government Approves Minister of Finance's Bill to Lower Income Tax Rates on Low and Medium Income Individuals and to Lower Corporate Taxes. Israeli Ministry of Finance Press Release. April 2004* <http://www.mof.gov.il/beinle/press133.htm> (Accessed 01.07.05)

4.4. China

China has recently become one of the most promising locations for the offshore OSD. Since its entering into the World Trade Organization in 2001 Chinese IT industry development experiences an increasing growth. The software industry growth rates through the 1990s were the world's average – around 20% annual. Starting from 1999 the growth rate has increased to 30% and future estimates are also positive. [14]

Like in other offshore countries the key role in this process is played by the government. It encourages the young people to study in the USA and the rate of the returning student is much higher than in India. Between 1978 and 1998 around 160000 Chinese students (18,8%) [14] have returned home. This trend allows flow of capital, knowledge and know-how between American IT companies and universities and Chinese firms. Large expatriate Chinese population in the USA and the South-East Asia countries also facilitates the promotion of Chinese enterprises as OSD vendors.

As an offshore location China is considered to become a strong rival to India. Chinese IT industry strives to get a position equal to India's. In 2004 China's software industry export has reached \$2.8 billion. Consider the growth: Chinese software exports in 2001 were \$700 million and are estimated to achieve stunning \$5 billion in 2005. The most optimistic researches estimate the growth of the Chinese software industry to \$27 in 2007.¹¹

The Chinese market is divided into system software (12 per cent), application software (63 per cent) and supporting software (25 per cent). [14] In 2001 there were over 400 000 people in the IT industry. Most of the Chinese IT firms are located in or near such industrial and technology centers as Beijing, Shanghai, Dalian, Shenyang and Zhunai [14].

Beijing, the Chinese capital is considered to be the main center of the IT industry. The Chinese analogue to the Silicon Valley is the Zhonguancun science and technology park with subsidiaries of the major IT firms like Intel, IBM, Motorola and Oracle.

The strongest advantages of China are a large supply of skilled labour, low wages, strong connections to the USA businesses and government support. However the future of China as an offshore location is endangered by such factors as the lack of English-speaking personnel, poor intellectual property legislation and information security, weak understanding of the western business practices.

¹¹ Wenlei, Ding. Hardnosed Software Battle. Beijing Review. December 2004
[http://www.bjreview.com.cn/200412/Business-200412\(A\).htm](http://www.bjreview.com.cn/200412/Business-200412(A).htm) (Accessed 01.07.05)

Entry, midlevel, and experienced IT workers in the People's Republic earn average annual salaries of \$5,460, \$8,800, and \$13,730 respectively.[10] Chinese tax rates are 33% for Chinese companies and 15% for JVs and wholly-owned foreign entities, on a net income basis¹²

4.5. Russia

Russia is not yet among the offshore OSD leaders but many researches make optimistic forecasts about the future growth of the Russian software exports. In the last five years Russia has shown average 60% growth. In 2003 its software exports has reached \$474 million and is expected to be \$1 billion in 2005. Russia has a number of distinctive advantages, according to RUSSOFT, Russia's IT services association [17], namely:

- High-class university education;
- Creative and skilled workforce;
- Geographic proximity to the Western Europe;
- Labor cost advantages over other offshore destinations;
- Cultural proximity to the Western countries;

However the Russian offshore OSD market is still immature and suffers from a range of drawbacks such as:

- Lack of marketing and sales skills;
- Lack of English proficiency;
- Weak business competency;
- Narrow offers: mainly application development, almost no BPO;
- Corruption and weak intellectual property legislation.

According to RUSSOFT there are approximately 250,000 IT professionals in the country. The number of developers oriented to export services is somewhere between 25,000 and 30,000. [17] A large proportion of Russian developers – about 30% - are certified in specific technologies such as Java, .NET or database management [17].

The geographical location of Russia itself is a unique advantage. It combines large scale with the geographic proximity to the Western European market. The time difference between Russian technology centers (Moscow, St. Petersburg or Nizhniy Novgorod) is 2 to 3 hours ahead the European time, which allows a better synchronization of the office hours than in India. Flights to Moscow from New York are 40% shorter than to Mumbai or Bangalore.

¹² <http://www.china-outlook.com/askeditor.html> (Accessed 01.07.05)

In the last few years the Russian government has significantly increased its attention and support to the IT exports industry. The Russian authorities have started a range of initiatives to deregulate IT export, support marketing campaigns abroad, and stimulate internal market by simplified and lower taxation. Also the government plans to establish several technology parks, like those in India or China around the main industrial and science centers of Moscow, Novosibirsk, St. Petersburg, and plans direct investments into these projects.

Due to a lack of an effective IRP legislation in the past the intellectual property protection still remains a question of concern among the foreign investors. The recent moves of the Russian parliament have show hopes that the Russian legislation will have enough tools to ensure the protection of IP [17]. The increasing numbers of IP breach cases being heard in Russian courts proves this expectation.

The average annual programmer's salary in Russia ranges from \$5000 to \$9000. This numbers may significantly differ depending on the region. While salaries in Moscow can reach the average European level, wages in other regions of Russia, even in the European part are much favourable and sometimes even lower than in India or China. Russian corporate tax rate is currently 24%.

4.6 New emerging and possible future offshore destinations: Ukraine and Kazakhstan

During the last decade the new countries, which have been established after the fall of the Soviet Union, experienced political instability and economical downfall. In the last years some of them have almost recovered from the difficulties of the past showing now economical growth. We will consider two countries, different in degree of readiness to become the new offshore destination. The first one is Ukraine, a European country with strengthening relationships to the EU members. The other one is Kazakhstan, a country in Central Asia with strong and fast developing economy.

At the moment only Ukraine is close enough to meet the general criteria for the offshore destination. First of all there is a considerable demand for the Ukrainian software exports. In 2002 it was estimated to be \$70 million with annual growth of 15%-20% [3]. This number is comparable to the starting demand for Israeli or Chinese IT industry export in the early 1990s. In the same time there is a strong domestic demand of about \$70 million in 2002. [3] Last year software exports figures have reached \$110 [14]

Ukraine shares the intellectual potential of the former USSR, and its technical higher education is still highly valued. The Ukrainian universities provide over 7000 graduates annually. Total number of people employed in the IT industry reaches 15000 [3].

Ukraine has an advantage of a geographical proximity to Europe. Time difference between Kiev and the major European centers is just 1 hour. Frequent and short flights (Austrian airlines alone has 20 weekly flights to Ukraine) coupled with synchronized business hours can create possibilities for near-shore outsourcing for the European companies. Salaries of the Ukrainian programmers are considerably lower than in other offshore destinations: they vary from \$3600 to \$8000 per annum.

In general Ukraine has the same disadvantages as Russia: English is not widely spoken, lack of business experience, piracy etc. It is also combined with recent political changes that also have caused a growing pessimism among the foreign investors. Potential of the other offshore locations are not yet fully exploited and due to these facts it is unlikely to expect Ukraine to become a strong rival to India or China in the offshore OSD in the nearest future.

The other country is yet unexplored in regard of the offshore outsourcing. This is mainly due to the fact that Kazakhstan still does not meet the core requirements for the offshore OSD.

Kazakhstan has recovered from the planned economy collapse and has succeeded to establish a growing raw export oriented economy. Annual GDP growth rate is as high as 9,1%. Kazakhstan IT industry still remains mostly hardware and software oriented, but there is a graduate movement to the services. Piracy remains the main issue in the IT industry. Kazakhstan government attempts to change the situation can be considered as successful: the end users tend to use licensed software and foreign software vendors, such as Microsoft and Oracle, report two- or three-fold sales growth [16].

The number of outsourcing provider in Kazakhstan is few, and no one of them is well-known abroad. The contacts in this field are ad hoc, and Kazakhstan software producers do not consider offshore OSD as their primary activity.

In general, the lack of international contacts and demand for Kazakhstan IT exports, insufficient infrastructure, weak IP legislation, low English speaking ability, poor geographic position (landlocked, big time difference, expensive flights) coupled with corruption and low business experience do not make Kazakhstan a favourable offshore destination in the near future.

Kazakhstan programmer's salary is lower than in Russia and ranges from \$2400 to \$5000.

4.7 Near-shore OSD Destinations: Canada

In general near-shore outsourcing are a compromise between in-country and offshore outsourcing. Canada for example combines advantages of overseas destinations such as a labour cost advantage over the USA. Canadian IT jobs are paid similarly or just a bit less than in America, but due to the exchange rate the labour savings are about 30% [6]. On the other hand, Canada is in the same time zones as the US and Canadian cities are close to American.

Canada has a modern developed IT infrastructure. It has a number of technology centers, such as Toronto, Ottawa, and Vancouver. Canadian companies are experienced in software development, mainframe, wireless and semiconductor technologies. [6].

Canadian political and economical stability combined with a strong legal system provide incentives for those clients, who have concerns about these factors in offshore destinations, like India or China. Canadian business practices are similar to the American, not to mention a close cultural proximity.

However there are a number of reasons, which do not allow Canada to become an outsourcing 'paradise'. First of all, it is rather expensive to outsource the application development in Canada comparing to India, China or even Ireland. In addition to this there is a "rather ordinary level of customer satisfaction among U.S. companies that have outsourced to Canada" [6].

Programmer salary in Canada ranges from entry level CAD27000 (\$21841) to medium CAD36000 (\$29121) and up to CAD48000 (\$38829) depending on province. The highest salaries are in Ontario and the lowest are in Manitoba. ¹³

Tax rate in Canada ranges depending on province and income. In Ontario, for example it is from 18,62% to 36,12%.

¹³ <http://www.payscale.com/salary-survey/aid-10905/rid-79/fid-7031/RANAME-SALARY> accessed 01.07.05

5. Current State and Trends in OSD

The demand for offshore OSD continues to grow from its long term client such as the USA, countries of the EU, Australia, and Canada. In the recent years new clients have also emerged. They are the developed countries of South-Eastern Asia and Pacific region, namely Japan, South Korea and Taiwan. The United States however are likely to remain the biggest user of the offshore outsourcing for another decade. The American contribution into the international outsourcing is expected to reach \$17,6 billion in 2005 [14]

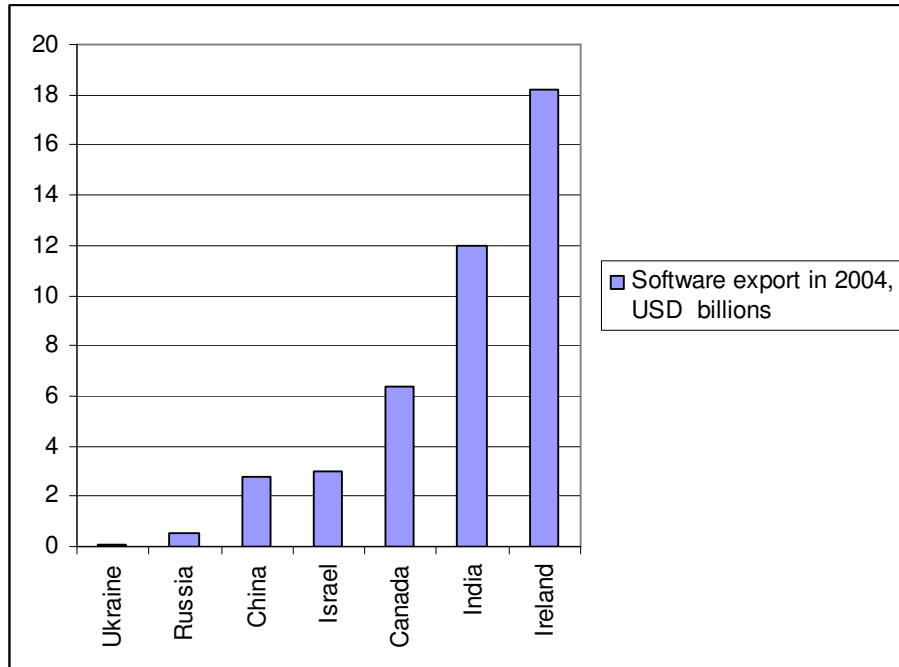


Figure 2. Software exports in 2004 by countries.

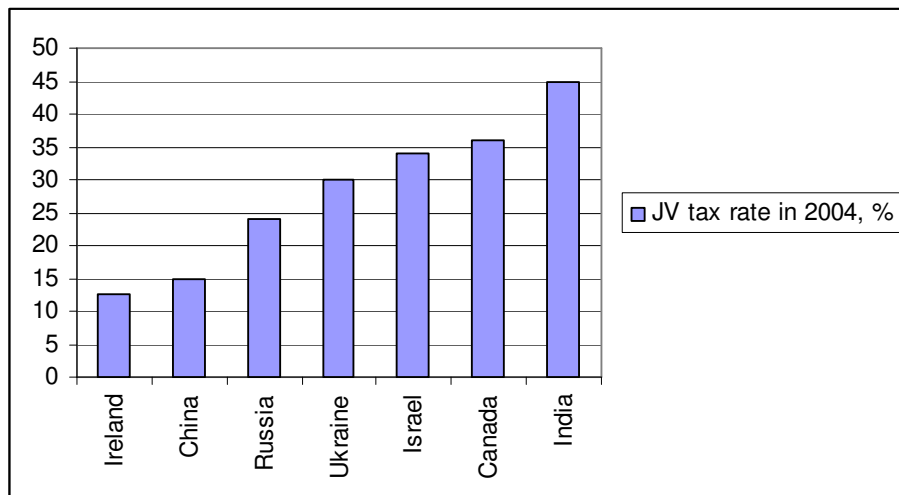


Figure 3. Joint-venture and foreign-owned branches tax rates in 2004.

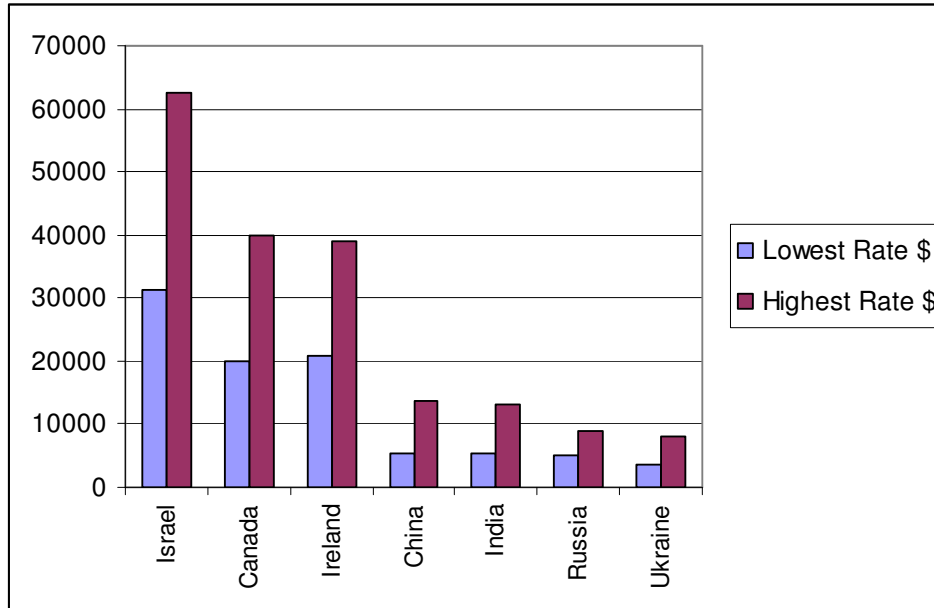


Figure 4. Programmer salary ranges.

The international offshore outsourcing landscape shapes up as a network of interconnected technology centers. These centers can be the command and control, like New York, Los Angeles, London or Tokyo, or secondary centers, specialized in one or several fields of outsourcing: Bangalore, Mumbai, Dublin, Shanghai, Haifa or Moscow. “The actors in these networks are connected by flows of various types of information, knowledge and capital, which help to shape the networks and also open up the possibilities of establishing new nodes”. [14]

The experience of the last decade of the offshore outsourcing has revealed a number of problems in conducting this kind of work. The cost savings achieved by employing personnel abroad are also coupled with decreasing quality of the final product. Body-shopping causes problems with working visas and illegal immigration. Relationships with foreign companies increase in complexity creating managerial overhead. Observing these factors companies now have to determine the limits of the distance software development. As a result we now can see the increasing competition between the offshore companies and companies providing in-country (domestic) or near-shore outsourcing. The examples are not just Canada with its 30% cost advantage over the USA [14] or some countries in the Caribbean and Mexico, which has increased its IT exports by 80% in 2000. We can also find examples of near-shore, with Chinese companies outsourcing Indian, Japanese or Singapore firms.

The nature of the competition also become more complex and includes several tiers. The first tier, the most mature offshore firms, such as Indian Infosys and Wipro, now are not concerned with rivals in their region. They move from OSD into management and consultancy business and are considering Western well established brands like Pricewaterhouse-Coopers or Arthur Andersen to become their major competitors in this market [14]. The second tier firms, which appear in less

important technology centers like Mangalore or Mysore in turn can see their potential competitors in third-tier Chinese or Philippines companies, aggressively entering the outsourcing market.

The main challenges in the contemporary offshore OSD have roots in problems of coordinating distance work across time, space and culture. The necessity to satisfy constantly changing clients needs, meet quality standards requirements, time schedules turns offshore companies into entities with sophisticated internal organisations. This process is also caused by continuously increasing clients' demands and expectations. In summary Sahay S. et al (2003) points out the following key feature which define and shape the offshore outsourcing:

- Network structure spread across temporal, spatial, organizational and national boundaries
- A new breed of smaller 'born global' firms
- Central role of ICTs in coordinating network activities
- ICTs necessary but not sufficient condition for effective coordination
- Offshore OSD reflects features of both services and manufacturing
- Offshore OSD involves varying level of intellectual and creative input
- There are varying levels of scalability
- Magnified influence of social and human issues
- Rapid technological and organizational change in the offshore OSD requires continuous reflexive monitoring
- Multiple options for customers of the offshore OSD in terms of countries and firms
- Heightened competition for suppliers in a rapidly expanding marketplace
- Competition from 'nearsourcing' and 'domestic' vendors
- Need to develop blend of global and local approaches to management
- As the offshore OSD becomes increasingly common, there is the need to understand the process of how a GSA relationship works in practice

Companies practicing the offshore OSD have accumulated a significant amount of empirical data and experience in dealing with problems of managing OSD projects. In the same time there is a lack of researches, which could explain how the relationships in the offshore OSD work. The prior researches in the offshore outsourcing were aimed primarily to the fields of services such as help desks or call centers or airline ticketing [14]. Sahay S. et al (2003) also points out, that these researches focused on communication or coordination problems, local or cultural issues. They are important factors, but rather static in nature and not able to provide an explanation of how the offshore OSD, that is processual in nature changes. [14]

As a result it is likely to expect that in the future researches the outsourcing of software development will be considered more as a complex notion combining in-country, near-shore and offshore OSD, and will pay more attention to the nature of the processes of the OSD and the factors that define and shape them.

6. Conclusions

The task of this paper was to introduce the phenomenon of the contracting out the software development work. This task was divided into two parts. The purpose of the first part was to provide a general overview of the OSD. A common definition of the OSD was presented, together with the main factors that influence the decision to start OSD projects. These factors were examined from the perspective of both client and provider. The main challenges in the OSD were also presented. In this part the paper's main contribution at the theoretical level was an aggregate depiction of the OSD

The second part is focused more on the offshore OSD. I presented the general requirements for countries that can be considered as offshore OSD destinations and then examined a number of countries in this regard. I tried to answer the following questions:

1. What are the major offshore outsourcing destinations?
2. What trends existed in the offshore OSD market?
3. What is the current situation in the offshore OSD?
4. What are the perspectives of the further development of the OSD?

In this part the paper's contribution is a description of the modern state of the offshore OSD supported by the current and predicted figures of IT exports, wages and tax rates.

This paper is mainly focused on discussion of the offshore OSD and can be criticized for the absence of description of an important part of the OSD – in-country OSD. This topic itself is considered to be huge and unfortunately cannot be accommodated into the limited volume of the current work.

This paper presents the preliminary findings. The future research should be aimed to find answers to the following questions:

- What are the success factors in offshore OSD?
- What are the trends of competition between offshore, near-shore and in-country OSD providers?
- How decisions on entering the OSD contracts influence the strategy of a company?
- What factors can influence building long term relationships in the outsourcing of software development?
- What are the factors that can turn offshore OSD relationships into a long term partnership?

Answering the questions above would help to understand the strategic meaning of outsourcing and give a better knowledge base for decisions on OSD.

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About the author:

Oleg Ishenko,

BSc Telecommunications Industry Business Management. University of IT Tashkent, Uzbekistan.

MCSE, MCDBA

Currently (2006) Master student at Humboldt Universität zu Berlin, Germany. Fach:

Wirtschaftsinformatik (IT in Business)

Research page: SEOResearcher.com <http://www.seoresearcher.com>

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Contact e-mail: oleg.ishenko@seoresearcher.com