Maryna Yaroshchuk
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Drivers of IT Industry in Ukraine, Bulgaria, and Romania

Introduction

In the era of global knowledge-based economy, informational technology (IT) plays a unique role in increasing competitiveness of all different sectors of economy and the country as a whole, because IT helps to spur productivity in the production process, to bring businesses to the global level, to make government more transparent and keep society informed. The success of the IT industry will be key determinant of Ukraine's potential to compete on international arena, because reliance on export of primary commodities (metals and minerals) are dependent mainly on gas prices and investment. As the prices for gas are increasingly rising, due to political tensions with Russia, and investment into manufacturing facilities is lacking, the need to resort to knowledge-intensive, value-added production becomes apparent for creating wealth for the country and providing sustainable social development. At present, Ukrainian IT industry is one of the most dynamic sectors in the country, with growth rate of 23% in 2007. Although Ukraine cannot still compete with India or Ireland, but it is not terra incognita anymore for foreign customers and investors.

The question that is put forward in this research is: How successful is Ukrainian IT sector comparing to other countries in transition and what impact does it have on the country's economy? I believe, valuable lessons can be learned when *comparing and contrasting Ukrainian case with Bulgarian and Romanian IT industries*. Bulgaria and Romania were chosen for this case study, as the three countries have a lot in common when it comes to legacies of the past. Bulgaria, Romania and Ukraine, had patrimonial type of communism regime with little rational bureaucratization. Another common feature, is that they shared a similar starting point in terms of educational foundation after the collapse of the Soviet Union, which makes it interesting to track the evolution of the IT industry in these three states and to observe features of diversity and commonalities. At a first glance, it is conspicuous that in 90s and till 2003 Bulgaria had predominantly local ownership which is changing rapidly now with the growing interested of MNCs in the country, whereas Romania has consistently enjoyed increased presence of multinationals. Thus, the aim is to locate Ukraine on this axis and understand causes and effects.

To better appreciate the IT competitiveness of Romania (#40), Bulgaria (# 42), and Ukraine (# 56), as rated by the Economist Intelligence Unit in 2007, the Diamond Model by Michael Porter will be used. This model encompasses a majority of the criteria necessary for the purpose of the cross-national IT sector analysis:

1. Factor conditions (skilled labor, governmental policies, infrastructure)
2. Demand conditions (both domestic and external will be reviewed)
3. Strategy, Structure and Rivalry (collaboration and clustering will be also discussed)
4. Related and Supporting Industries

Moreover, in this Diamond Model the role of government and importance of clustering is considered, which perfectly fits the purpose of the project. As a result, a clearer picture will be

envisioned as to competitive advantage that Ukraine has for attracting foreign investors, the problems it has to tackle and the experience of the neighbors to learn from.

The successful development of Information Technology Industry in the Ukraine results from a number of advantage factors in the country. According to Porter, there are two types of such advantages: comparative and competitive. The comparative advantage comes from inherited factors, such as cheap labor, higher education institutions and high literacy rate. The competitive advantages are the ones that are purposefully created through strategic interaction among actors, thus they are hard for other countries to copy. The first section will examine such factors as skilled labor and infrastructure, which are, on one hand, left from previous type of ruling, but have to be addressed by the present governments.

Factor conditions.

1. <u>Skilled Labor</u>

Bulgaria, Romania and Ukraine have recently has caught an eye of foreign customers in terms of ordering IT projects. These countries are seriously considered due to the low cost and highly educated human resources. However, the situation on the labor market of Ukraine, Bulgaria and Romania is compared to see which country is doing better, this is done by discussing whether the quantity and quality of workers supplied meets demand of the market, reaction of the state to this issue and activities of business community in this field. For this purpose, software industry is considered, because it serves a driver of ICT development and a "carrot" for international companies, which are using software firms' solutions. Hi-Tech Initiative, a local alliance of technology organizations, claims that almost every Ukrainian company has a western project in its portfolio. The most popular trend is IT outsorcing, which is supported by the fact that **Ukraine** was included into the five most attractive outsourcing directions in some Western countries in 2006. What are the reasons that prompt western companies to outsource their projects to Ukraine? According to the Global Outsourcing Report, the leading forces in the IT outsourcing market worldwide are now "*quality* and *speed* to market, not just cost of services"[1]. Thus, given high quality of education of Ukrainian workforce and favorable geographical location, such a trend is conducive to the growth of the Ukrainian IT industry, provided companies do find enough intellectually potent staff in the host country.

It is commonly known that Ukraine has ihereted a scientific base along with its various technological and scientific establishments, mathematical schools and centers of computing technologies. Another fact is that 30,000 computer students graduate each year, who are praised for their analytical and creative skills. However, employers are not satisfied, as graduates do not have good *command of English, management skills and solid knowledge of the software development process*. Thus, despite of large number of capable young workforce the industry experiences a shortage of IT specialists. The larger spending of budget on education (5.4%), comparing to Bulgaria (3,5%) and Romania (3,5%), does not

[1] Mark Minevich, "The Global Outsourcing Report: Opportunities, Costs and Risks" The CIO Insight http://www.hoa.hu/download/upload/67/html/Global_outsourcing_report_CIO_Insight.pdf (accessed December 13, 2007)

bear fruit yet either. At the moment, the percentage of professionals trained by higher educational institutions is growing, but is still low.[2] Thus, business community calls on the state to reform and invest more into the educational system.

In terms of reform, companies suggest that the content of curriculum should undergo change, as the quality of IT-education in Ukraine can't satisfy modern market demands and challenges. Software companies also point out to the problem that educational institutions do not employ practitioners to teach new courses in computer sciences. As a result, more potential employees go abroad for education. *As stated by Viktor Maznyuk, up to 5% leave for training, whereas only 1-2% move to work in foreign countries*.[3] The repersetatives of the educational field bring up an argument that national universities should give a good basic foundation, and the rest of skill tailoring is to be done by the industry players, because IT industry evolves rapidly. However, most recently Ministry of Education and Ministry of Transport and Communication have started to pay attention to this issue in a way of organizing several conferences called for brainstorming solutions to the problem of educational service in ICT discipline. As an outcome, plenty proposals were aired, among which such steps were suggested: to create a mechanism allowing operational changes in the educational program and content of discipline once in 2 years; to increase the number of hours for IT classes to 15 credits; to establish a system of monitoring demands and needs of ICT labor market, as well as direct connection with the interested enterprises (potential employers); engage ICT companies in practical training of students and ensure provision of modern equipment for hi-ed institutions.[4] The latter emerges as a most practical way of cross-field cooperation, which will be discussed in Chapter 3 dealing with collaboration.

How do Ukrainian neighbors (re)act to the problem of deficit of a specialized workforce in IT industry?

The IT sector in **Bulgaria** has been surging recently, which predictably led to the shortage of highly qualified labor force in software industry.[5] Unlike in Ukraine, the competition for professionals became even more intensified with an impressive influx of MNSs. In the last 3 years such big name companies decided to capitalize on Bulgarian advantages, among which the most prominent are IBM, HP, Tumbleweed, Software AG, Jonson Controls, Microsoft, and Cisco[6]. At present, Bulgaria produces only 3,500 software engineers per year and it becomes more challenging for foreign companies to find suitable employees. A common feature is that education system appeared not to be ready to produce specialists with a "right profile" at such a fast rate of market growth.

However, unlike in Ukraine, the key technical universities have *already* introduced new programs that meet international standards and industry's demands: The Faculty of mathematics and

[2] only 2.83% of the total number of graduates qualifies in the IT field (computer science – 1.5%; computer networks, automatic control – 0.38%; and computer engineering – 0.95%)American Chamber of Commerce, *Commerce*, No.18, October-November 2007, p.10. http://www.amcham.kiev.ua (accessed December 13, 2007)
[3] Interview with. M.Yaroshchuk on January 3, 2007.
[4] A conference on Perspectives and Problems in Preparing IT specialists, State Department for Communication and Informatization. http://www.stc.gov.ua/uk/publish/article/60468 (accessed January 3, 2007).
[5] "Shortage of IT Specs and Engineers in Bulgaria" *The Sofia Echo* http://www.sofiaecho.com/article/shortage-of-it-specs-and-engineers-in-bulgaria/id_14223/catid_23 (accessed December 13, 2007)
[6] InvestBulgaria, http://investbg.government.bg/upfs/27/ICT_factsheet_Jan_2007.pdf

informatics (FMI) of Sofia University, Plovdiv University, and the American University in Bulgaria implemented an updated computer science curriculum, as well as joint research labs in cooperation with the abovementioned MNCs[7]. Moreover, Bulgarian *government* started to be active since 2005 in its support for the industry by providing PCs in the schools, but mostly *via cooperation with foreign companies*.

Having the same problem, the key divergence between Bulgaria and **Romania**, is that the government of the latter started to act earlier and more vigoriously. Such a commitment on the behalf of Romanian authorities, as well as the evolution of policies and introduction of various programs commissioned by the state, can be explained by Romanian accession to the EU. The emphasis is put on strengthening research base, providing competitive financial incentives to decrease digital divide in the society, and furthering certification program for IT professionals. Therefore, the EU enlargement has positively influenced an interaction between the actors and stakeholders. The commonality between Bulgaria and Romania lies in the fact that both *MNCs and the EU enlargement prospect give external pull to the IT market development*.

Perhaps no industry can stay competitive long enough just based on the inherited factors of production and without a support from government in form favorable policies. Of course each state has its own tradition and blindly duplicating policies in order to gain competitive advantage can lead to the unexpected outcomes. However, it is useful to look at the strategies of the three states and to check to what extent they are similar or different

2. Governmental Policies

Ukraine

As it is impossible to imagine any innovative advancement without IT, officials have declared information technology among priorities for national development. Thus, in the beginning of 2007 the previous parliament adopted the Law of Ukraine "On the Foundations of the Development of Ukrainian Information Society in 2007-15", which was followed by the Action Plan on Implementing the Tasks Envisaged by the Law of Ukraine. The goal of the law and the subsequent documents is to promote information society in Ukraine, hence strengthening basis for IT sector development. The proposed measures call for such tactical actions as: ddevelopment of national information infrastructure and integration of it into international infrastructure; devising and enacting legal regulations concerning information; Using information and communication technologies to advance State governance;[8]

Growth of IT market is conditioned also on *improvement of investment climate*. In this domain, current president Yushchenko issued decree in the end of 2005 which created a State Agency for Investment and Innovations (SAII). Two more additional bodies where brought into existence in 2006, such as Ukrainian Center for Investment and State Company for Innovations, then later were brought under the auspices of SAII. In May 2007 thanks to initiative of SAII and National Technical University "Kyiv Polytechnic Institute" a special corporation was born, Science Park "Kyiv Polytechnic", which

[7] Bulgarian Software Industry Assessment, http://www.daits.government.bg/gallery/BSI/BulgarianSoftwareIndustry.pdf (accessed December 27, 2007)
[8] Government portal http://www.kmu.gov.ua/control/en/publish/article?&art_id=10280806&cat_id=10280794

will bring together academia, science researcher and manufacturers to reinforce innovative and informational development of the country.[9] Yet, according to Anatoliy Zayets, First Deputy Head of the State Agency for Investment and Innovations, "one key effort needed to improve the situation is the development of a *sustainable strategy* in creating legislation that would help build institutional infrastructure in this industry."

However, among more specific incentives for investment into the industry "only noticeable government policies were a change in VAT taxation[10], generous depreciation rates for fixed assets, increase of an education budget (to 6,5% of budget) and a visa-free regime for European and American citizens.[11]As for government spending, according the Ministry of Transport and Communications, the IT sector accounted for a mere 0.2% (UAH 205.32 million) of the total investment made in fixed assets per sector.[12]

Since 2002 efforts by groups of deputies were made to pursue changes in support of the sector, emphasizing fighting brain drain, reducing profit taxes and payroll taxes. Yet, those groups dissolved when deputies were not re-elected again. Those in opposition to such measures claim that such subsidies/relieves would decrease government revenues. Yet, taxes in software industry are not high enough to influence budget balance.

Explanation from a business perspective sounds even more viable. If IT industry is considered per se, then its *current share of GDP is only 3%, whereas the threshold figure is 10%*. According to the General Director of Microsoft Ukraine, Vitaliy Lanovenko, when IT industry in Ukraine reaches this point, it would be difficult to neglect it, and then it could be more realistic to expect assistance from the state. Thus, the IT market has to grow at least 3 times, before the state will take notice of it[13]. Yet, this poses a puzzle for me, as it seems that already now such support is needed already, especially when it comes to IPR protection laws and their enforcement, alleviation of draconian taxes, custom rules, changes in copyrights, etc. The light in the end of the tunnel is given by such influential companies, as Microsoft, Intel, and Oracle, which repeatedly engage in discussions with the government to take necessary steps in this direction.

The root problems can be also eliminated by Ukraine's eventual accession to WTO, which imposes certain set of laws, standards and society's awareness of IPR issues. Accession into WTO (expected in January 2008), should serve as a positive boost for export-oriented industries, which is also a feature of Ukrainian IT at the moment. Consequently, additional optimistic prospect for Ukrainian economy will be launching of a Free Trade Area with the EU as a part of upcoming Enhanced Agreement, which is currently under negotiation. These two milestones are last chances for Ukraine to bring its regulations in compliance with international standards.

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[9] State Agency for Investment and Innovations (in Ukrainian) http://www.kmu.gov.ua/control/uk/publish/article?art_id=68679994&cat_id=43169

[10] The standard rate of VAT is 20%. The export of goods and a very limited range of services are zero-rated. PWC report, http://www.pwc.com/extweb/insights.nsf/docid/7275F998F4D080E680256F3200517D16

[11] "The Capital and the Provinces" Outsourcing to Ukraine. www.Goaleurope.com

[12] Ministry of Transport and Communications, http://www.stc.gov.ua/uk/publish/article/56658

[13] "Ринок IT в Україні складає 2-4% ВВП", РБК-Україна, 10 November 2007,

Being a late comer to the ICT market, **Bulgaria** has to catch up with the leaders by implementing necessary steps even more adroitly and massively, but in the shorter lapse of time. The government realized this, and especially *right after Bulgaria joined the EU, it has put software industry and ICT as a whole on top of its policy agenda*. Now the policy is divided into three categories: global, regional, and local.[14] The character of policies is naturally driven by the EU, which has high standards that Bulgaria is now striving to reach. As a result, the spectrum of stakeholders is broadened thanks to encouragements to develop joint trans-national infrastructure projects, cooperation between public, private and educational institutions and promotion of e-services.[15] As for the national level, it has been determined to foster the small and medium businesses in the ICT, ensure stable and foreseeable business environment, constant improvement of computer skills of the citizens. Adherence to the acquis in Information Society, rapid adoption of the Law on Electronic Commerce in 2006, should eventually help to establish lucid regulation of information society. Except these provisions, Bulgaria has also created the *State Agency for Information Technology and Communications* to expedite its integration to EU club of information societies. The goal of this agency is to "ensure enhanced social and economic development of the country." To my mind, such measures would have been possible only when there is agreement inside the national government as to the policy priorities. This is proven by Bulgarian case, as ICT is one of the major sections of the programs of the two political parties of the coalition.[16]

Apart from the numerous projects supported by the EU and the funds from international financial institutions, the *government of Bulgaria has also served as a main procurer of IT services and equipment.* Governmental purchases totaled to 50% of market sales, which grew last year by 23% (in dollar value).[17] Additionally, the Prime Minister reported that upcoming investment into infrastructure is estimated to be approximately 13 billion Euro for the time period in 2006-2015. As Businessmonitor reports, a Bulgarian SME Promotion Agency has been also contributing a lot into the development of IT businesses and funded 105 projects, 25 of which were IT-related.

On the other hand, thinking whether fast accession is a good thing (even to information society), it is worth taking a look at governmental practices in this field, especially when it comes to such lavish procurement. According to the observation of ICT Cluster, there is a problem in *absence of control over execution of public procurement contracts for IT projects.* This lack of control is exacerbated by lack of "mechanism to sanction either the contracting authorities or executors, when the project fails".[18] Although there is a Public Procurement Act, it is an implementation and interpretation of the law that is obscure (a pattern characteristic for majority of post-Soviet states). Bulgarian IT business community complains that enormous corruption and discrimination takes place during these procedures. For instance, Tsvetan Aleksiev, CEO of software company Sirma Media, claims that "80% of the applicants in ICT public procurement procedures are disqualified at the first stage of the procedure for unreasonable

[14] BulgarianSoftwareIndustry Assessment http://www.daits.government.bg/gallery/BSI/BulgarianSoftwareIndustry.pdf
[15] ibid
[16] ibid
[17] The Bulgaria IT Report, http://www.businessmonitor.com/it/bulgaria.html ((accessed December 29, 2007)
[18] ICT talent Bulgaria, News, http://www.ictalent.org/ICTInThePress.aspx?lan=EN (accessed December 29, 2007)

grounds or for minimum lapses in documentation, which companies don't have the chance to correct."[19] Partial solution to this bottleneck is for companies to alarm when they see such occurrence and possibly to act jointly in attempts to stop such malpractices.

On a positive side, as mentioned by InvestBulgaria, the latest incentives are "annual depreciation rate of 30% for machinery & equipment, 50% for new equipment used in new investments or expansion projects and 50% for software and hardware". Besides these development and government declaration and strategic plans, more concrete actions are still demanded and anticipated by the business community, for example in a form of tax relieves. To my mind, ICT business community has considerable bargaining power in voicing their dissatisfaction or proposing new measures, *because industry accounts for a considerable 9,9%* of the GDP (in 2003 it was 7%).[20] Also, business representatives could *draw attention of state authorities to experience of Romania,* which had introduced encouraging tax incentives for local IT companies earlier.

Although **Romanian** IT industry is dominated by multinational companies with prevalent outsourcing, as well as foreign prominence in production and exports, it doesn't mean that government did not play a role in its successful development. The state must have realized that growing IT industry, even if it is foreign owned, provides numerous opportunities for mushrooming consultancy firms, research and development centers and ICT industry growth in general. Even a mature market has problems that it cannot solve on its own, and governmental involvement is needed, especially when an industry is facing such a cumbersome matter as high piracy rates. As a result of governmental intervention into this issue, the stability and growth in the sector became possible.[21] Nevertheless, while government claims that significant efforts have been made to combat piracy, certain business sources point out that up to 70% of software used in the country remains to be illegal.

Actions of Romanian government are not on ad hoc basis, but rather a part of a sound strategy. Starting from 2001 government has recognized ICT sector as "strategic priority for the national economy".[22] Consequently, a separate body was created, *Ministry for Communication and Information Technology*, whose responsibility is to devise necessary policies for the industry. According to the Romanian government program for 2005-2008, a "single autonomous authority of regulation and control" in the sector is founded, which will be subject to Parliament, with the mission to facilitate coordination. Of course, majority of past and present initiatives where set out with a view on EU accession and integration. Both legislation and objectives were to be synchronized to ensure sustainable development of the sector.

Among other initiatives that support government's vision to turn the country into a zone of high technology, are

[19] ibid
[20] "ICT profile" by ICT Cluster. www.i3p.it/files/3%5B1%5D.%20ICT%20Cluster%20-%20BULGARIA.pdf (accessed 26 December 2007)
[21] Businessmonitor Romania
[22] „Future Prospects in Romania: Scenarios for the Development of the Knowledge Society in Romania" fistera.jrc.es/docs/Future%20Prospects%20in%20Romania.pdf (accessed December 26)

- Exemption of employees employed by software companies from income taxes [23]
- Reduction of income tax for programmers from certain universities
- 25-month VAT postponement for new goods
- 50% depreciation during the first year for new goods
- public services in electronic form available to citizens and business
- Right for every citizen and firm in Romania to an electronic signature

Another possible explanation for increasing attention to incentives is that "brain drain" still remains an issue for the industry. Thus, government tries to reward those active industry players and indirectly tries to create more benefits and better conditions for IT specialists.

As reported by Businessmonitor, since 2004 the government started to lead the IT spending and is recognized, along with banks and telecoms as the largest spender. "For the period 2005-2007, ICT spending in Romania has grown at 12,2% yearly". However, one has to consider the proportionality of funds distribution, as at the moment regions are still lagging behind in development.

Thus, the capability of government to prioritize and focus on development of a specific sector by devising and deploying a clear strategy along with providing financial investment, can be an effective driver of progress. Looking at the dynamics of IT industry development in the region and comparing the approaches that state governments have adopted in order to aid this development, it can be noticed that although Bulgaria and Romania have been in more or less similar condition in the beginning, Romanian government's timely efforts to recognize the potential for the IT industry and to coordinate efforts in order to build up the sector has been paid off by the country's leading position among the two. In comparison to its neighbors Ukraine has yet to model their successful practices and attempt to avoid the dangers.

Valuation	Bulgaria	Romania	Ukraine
IT % of GDP	9,9%	8,2%	3%

3. Infrastructure

Ukraine

The success of IT is dependent on quality of telecommunication infrastructure, internet penetration and PC use.

According to analysts Oleksandr Bakalynsky and Valentyna Vertel, "the amount of telecommunication services delivered in 2002-06 rose by nearly three times, reaching around UAH 32 billion in 2006; while capital investment in the development of telecommunication networks went up by 3.5 times, of which around 80% was invested by mobile communication operators."[24] Provided that the telecommunications industry is receiving a high-level of foreign investment (more operators are penetrating the terrain), it is likely that the communication services will continue to increase while the respective fees will decrease with increasing competition.

[23] "if the employee works within a department in the firm that is specialized in informatics, has a university degree in automatics, computer science, mathematics, or electronics, and her/his employer obtains, from the creation of the software, an annual income of at least 10.000$ for each employee that is exempted from income tax"

[24] Oleksandr Bakalynsky, Valentyna Vertel "The Innovative Development of Ukraine's Competitiveness"

Whereas 40 million of Ukrainians are using cell phones, only 4 million have access to internet, as estimated by Microsoft Ukraine. Another source, Bigmir.net reports that out of 100 citizens there are only 10,1 internet users. At any rate, although the number of users grows each year, it is still very low comparing to European level.

At the moment PC penetration rate is low as well, as demonstrated ratio of *9* PCs for 100 people, which is twice as less than in neighboring countries. Volodymyr Pozdnyakov, Regional Manager of analytical company IDC Ukraine, testifies that in 2-3 years Ukraine will catch up with other CEE states, and in 2009 it will have the data corresponding to the current market estimates of Poland. The numbers are bound to change, as there is steady increase in PC purchases by the population due to decreasing prices, especially on laptops. Thus, sales of PCs have grown by 43,7% in 2006, as compared to 2004. To sum up, the market is far from saturation and the growing dynamics will persist in the next 3-4 years.

THE DEVELOPMENT OF TELECOMMUNICATION SYSTEMS IN UKRAINE			
Number per 100 Residents	January 1, 1999	January 1, 2007	January 1, 2010 (Forecast)
Fixed Phone Lines	18.3	26.4	30.9
SIM Card Penetration	0.63	104	126.9
Internet Users	0.39	10.3	27

Source: State Statistics Committee of Ukraine.

Bulgaria

While telecommunications are one of the fastest developing areas in Bulgaria, both from the point of view of foreign investments and from the point of view of implementation of new technologies, Bulgaria is lagging behind in the process of digitalization of phone lines when compared with the countries which entered the EU in the first wave of its expansion.

As in other countries, there is an area divide issue. Thus, in the big cities the process is almost finalized, while in the other areas the process is going slow.

Fixed line vs mobile phone lines in households

Year	Fixed	Mobile
2005	75%	48%
2006	62%	70%
2007	68%	68%

Source: BulgarianSoftwareIndustry Assessment

As for Internet penetration, the statistics provides that the country had above 2,400,000 Internet users at the end of 2006 or around 31%, whereas access to computers was recognized among 27,9% of the population, according to e-Bulgaria report.

Romania. It can be said that investment in telecommunication infrastructure in Romania is still insufficient and important investments are not being considered for the near future.

For this country, large rural population (in 2004, 46.4 % of the total population) is a key issue when it comes to developing the connectivity. Since it is not very economically efficient to expand fixed lines network in rural areas, wireless solutions and cable TV are perceived as cost saving alternatives. Hence,

mobile subscribers as of March 2007 reached 83.4% (larger compared to Bulgaria's 68%, but smaller than Ukraine's 104%). As for internet access, 23,9% of population enjoy this opporunity.[25]

II. Demand Conditions

Ukraine

International. Among numerous motivations for increased interest in CEE region is geopolitical one. In this respect, one of the reasons that could draw attention from the established market leaders, such as India, Israel and Pakistan, and shift it towards CEE countries is the uncertain political situation in the Middle East.[26] Thus, Ukraine, along with CEE region, has an opportunity to benefit from the relocation of market forces and snatch a slice of a market pie in future.

Culture and distance are the main triggers for the pervasive inclination towards nearshoring, as it provides more advantages for international collaboration. The small difference in time facilitates communication between the headquarter office and a Ukrainian team.[27] The comment provided by the CEO of eZ Systems, an international software company with HQ in Norway, which opened recently a development center in Odessa, confirms this trend: „To get there I need to fly with a one stop-over in Warsaw or Vienna. But it didn't take me longer to go to Odessa than to go to Madrid. It's the same distance, and when I come there the people are there are very much like us".[28] Thus, European companies pose as the most interested ones in outsourcing their services to Ukraine, and among them German companies top the list. According to GoalEurope report, there are about 60 companies from Germany, which employ 6% of Ukrainian software developers.

Zooming in to the CEE region and considering Ukrainian position in comparison to its neighbors, a study on global services location by A.T. Kearney shows that western large companies have started to look further east. This is due to increasing "living standards, wages and costs in Central Europe, like Poland and Hungary".[29]

However, *2 issues can undermine the low payment rate of IT professionals in Ukraine*: *increasing property prices in the capital and head-hunting practices*. One of the ways of attracting high skilled professionals was increasing the salary offers, which consequently raised the price of entire project. According to the report provided by Technopark corporation, such practices will be cut short by introducing the Anti-hunting Lawbook to prevent unreasonable HR activities. A possible solution for western companies wishing to keep the price/quality ratio, is to

[25] „Future Prospects in Romania: Scenarios for the Development of the Knowledge Society in Romania" fistera.jrc.es/docs/Future%20Prospects%20in%20Romania.pdf (accessed December 29, 2007)
[26] "Outsourcing to Ukraine: 2006 results and 2007 expectations" Outsourcing News . OOBP Organization. http://www.oobp.org/OOBP+News/569.aspx
[27] "The Capital and the Provinces" Outsourcing to Ukraine. Goaleurope.com
[28] ibid
[29] Global Services Location Index, www.atkearney.com/shared_res/pdf/GSLI_Figures.pdf

go *regional* and to consider other cities of Ukraine with strong talent pool, for example, Odessa, Kharkiv, Dnipropetrovsk and Lviv, but with lower real estate prices.

The demand from domestic forces is considered to be weak at present, but the one that will grow with time. This will happen with advancement of technological culture and ability of Ukrainian managers and government officials to appreciate technological tools for strategic decision making, not mere calculations or communication procedures. At the moment, the demand for hi-tech and IT products and services comes from telecommunications (satellite providers), financial (banks) and insurance companies. As Anatoliy Veres, General Director of Kvazar-Mikro, notes that these sectors face fierce competition, are client oriented, and thus such features put pressure to innovate and to be able to provide timely service to their customers. The large Ukrainian corporations that are considering IPO are especially keen on introducing the latest IT developments, as they must demonstrate transparency and efficiency in their business practices.[30]

Thus, international demand serves as a trigger for Ukrainian IT industry development, especially considering that foreign companies are more demanding. Yet, Ukrainian IT companies have also started to pay more attention to the needs of the domestic market. The increasing number of orders from both sides will drive up the competition among software firms which will strive to provide better quality of products and also add value to services.

Bulgaria and Romania

Comparing Bulgaria to other recent EU entrants, real estate prices and salaries are the lowest here, as stated by InvestBulgaria agency. The wage increase is 10% a year, but the average salary equals 225 usd. Combined with reasonable office prices, rapidly developing infrastructure, and governmental support of the sector will keep international investors interested in the country in the near future. This assumption is shared by International Herald Tribune observer, according to which at the moment "the ratio between the level of labor knowledge and the price is very competitive, and Bulgaria will remain one of the main destinations for European near-shoring projects over the next 5 to 10 years".[31] But if we think strategically and consider that the outsourcing boom will be over then, in this case Bulgarian *IT industry has to start specializing and develop more sophisticated products*, as it will not be able to compete with such traditional providers of standard software solutions as India and China.[32]
Additional attraction factor for multinational companies in the country is a "follow the leader" attitude. After SAP and IBM penetrated the market, other big name companies, such as

[30] Anatoliy Veres "Technology in Demand" , AmCham report
[31] "Why location matters to outsourcers" http://www.iht.com/articles/2006/09/08/business/wbbulg.php
[32] „Bulgaria's IT sector breaks the brain drain", 20 May 2007, 13:33 CET, http://www.eubusiness.com/Employment/1179633613.18/

Microsoft and HP and others have followed their example. In 2006 HP opened a global delivery center, which provides "remote technical services and support for its clients in Europe, the Middle East and Africa", as stated by Sasha Bezuhanova, general manager of HP Bulgaria.

The quality of Romanian IT professionals is also known through international business community, as developers from Romania remain among the top-ranked at global programming competitions. Moreover, according to Brainbench, Romania is the European leader in the number of IT professionals per capita.[33] Additionally, both Bulgaria and Romania climb the rankings in terms of location selection, due to significant improvements in their business environment, as the result of the accession to the European Union in 2007. However, as assessed by AT Kearney, "despite a larger population base, Romania's relatively higher costs put it among the middle of the pack at 33rd place."[34] The increase in salaries can be explained by the growth in competition prompted by the predominant presence of multinational companies, as according to latest estimates, nearly 90 percent of some 1,000 IT companies in Romania are foreign-owned. Hence, domestic companies had to offer additional financial benefits to lure in professional specialists.

On the positive side, this means that more professionals are going to consider staying at home. Although the salaries in the information technology sector remain quite low comparing to countries with developed IT markets, in comparison to other sectors in Bulgaria, IT jobs look quite attractive since they offer approximately ten times more than an avergae salary in the country. As the result, IT specialists in Bulgaria are said to increasingly choose a job at home.[35]

III. Strategy, Structure and Rivalry (incl. collaboration and clustering)

Country	Classification	Services	Growth rate	Number of companies	Foreign investment
Ukraine	Outsourcing 80% of products are not identified as origintaed in Ukraine	8%	23%	4,000 ICT 400 IT 15 market leaders 75%-outsourcing, 25% - focus on local clients	25% foreign investment. Predominantly SMEs. Microsoft, Flextronics, HP; more to come
Bulgaria	Outsourcing, yet with increasing share of local products development	25%	24.9%	1,100	9 major MNCs, 3 new MNSs in 2006; more to come
Romania	Outsouring Increasing value-added	97% (only 3% with products with high intellectual value)	15%	High competition, especially for public constracts/procurement	90% foreign owned.

The most recent developments on the Ukrainian ICT market are characterized by merger and acquisition (*M&A*) by foreign companies. A prominent example is that a global TII telecom

[33] "CIO's 2006 Global Outsourcing Guide" http://www.cio.com/documents/pdfs/2006outsourcing_guide.pdf
[34] "The AT Kearney 2007 global service location index covering 2006 shows MENA is gaining momentum" http://www.medibtikar.eu/spip.php?breve2333
[35] „Bulgaria's IT sector breaks the brain drain", 20 May 2007, 13:33 CET, http://www.eubusiness.com/Employment/1179633613.18/

company with headquarters in Israel is acquiring Telesens Ukraine, a company known as a leader in complex programming solutions for telecom industry throughout CIS. The agreement, signed on December 10, stipulates that the management positions and the Ukrainian brand will be preserved in the new structure, the number of working places will be increased, and the investment of $ 2,7 million will be directed towards the development of Ukrainian department in the course of 3 years.[36]In general 25% of software development companies are fully or partically controlled by foreign investors.[37] Naturally, competition has become more stiff among domestic firms, as more companies have appeared on the market.

Another feature of Ukrainian IT market, in constrast to Bulgarian and Romanian, is an increased *decentralization*. During the last three years this tendency has been reinforced, and such destinations as Kharkiv, Lviv, Dnipropetrovsk and Odessa have become noticeable by foreign investors due to strong universities and talent pools, as well as lower real estate prices and salaries. Consequently, new work places are created by foreign SMEs and the development of the region is spurred. Another impilication fo such a trend is that it will enable the regions to compete with Kyiv, keeping project prices low, but maintaining high quality of services. Nevertheless, currently Romania beats Ukraine in terms of export potential, where the latter is striving to become a leader for oursourcing in Eastern Europe. Yet, a drawback of outsourcing is that solutions developed by Ukrainian firms are sold by western companies under their own trademarks. So, Ukraine has not yet tapped into the most profitable sphere of software business either, which is sale of its own finished product, which provides tremendous leap for the domestic industry.

In terms of **collaboration and clustering** of academia, government and business, there are already a few "ice-breakers", such as Kyiv Polytechnic University, which have links with the leading international IT companies (Microsoft, Cisco, HP)[38] and as well as with the largest national IT firm, Kvazar-Micro, in setting up training labs and doing joint research projects. Such initiatives come from business side, both from domestic and international companies, although naturally the latter have more means to provide major assistance. According to Viktor Maznyuk, Hi-Tech Initiative, Ukrainian business community cannot afford to wait longer for governmental support in establishing special zones or centers, thus the companies are taking action in their own hands[39]. President Yushchenko has been promising to promote the project „Ukrainian Silicon Valley", the detailed program of which is not yet ratified, although the idea approved with passion. According to this proposal, hi-tech centers are going to be constructed in

[36] Israeli TII acquires Ukrainian Telesens, 14 December 2007, http://www.telesens.com.ua/pr/pr.html?41
[37] Volodymyr Mashchenko "Ukraine's surging software sector short on human resources", December 5, 2007, Kyiv Post, http://www.kyivpost.com. (accessed December 13, 2007)
[38] Emmy Gengler, "Ukraine and Success Criteria for the Software Exports Industry" The Electronic Journal on Information Systems in Developing Countries, http://www.ejisdc.org/ojs2/index.php/ejisdc/article/view/82 (accessed December 13, 2007)
[39] Interview with M.Yaroshchuk

5 regions of Ukraine (although IT business would like to see a wider scope of penetration), for which $100 million of private investmen is needed. While the paper is still in rhetoric (as new government is busy solving matters with energy supply and pricing), Telesens company is has already agreed with Kharkiv Polytechnic University to establish a so-called Silicon Valley complex on its basis. Faculty and students are involved into software production projects, while company provides with necessary infrastructure and training.[40]

Bulgaria and Romania have realized the power of clustering much earlier, thanks to the initiative coming from international companies and professional ICT organizations (BASCOM, BAIT). Already in 2001 Sofia University Cisco Regional Academy was created, and followed by other relevant programs such as Microsoft IT Academy, Oracle Academic Initiative, HP training centre, SAP labs, etc.[41] Similarly in Romania large IT foreign-owned companies have contributed to creation of software clusters in Bucharest, Timisoara, Iasi and Cluj.[42]

IV. Related and Supporting industries

Country	Related and Supporting Industries
Ukraine	Banking, Telecommunications, Games development
Bulgaria	Telecommunications, HR, finance
Romania	Mobile applications, service and support centers

According to Erik Franke, Microsoft General Manager, Telecom and IT are "converging" industries in Ukraine facing many of the same issues and becoming more intertwined. The problems present in IT, unfortunately, are also projected to telecom industry. Mr. Franke added that piracy poses a serious "security issue" for telecoms as well.[43]

Conclusion

In this paper the successfulness of IT industry was discussed in 3 NIS countries, which are currently in focus of international investment community. Although Ukraine, Bulgaria and Romania had similar starting point in terms of former regime and educational base, the trajectories of development varied respectively depending how the opportunities were embraced and strategies employed by the key actors (state, business and universities). To understand why Ukraine is positioned behind Bulgaria and Romania, 4 arenas of competitiveness have to be

[40] Elena Teslya "Ukrainian Silicon Valley" (in Russian), Computerworld, http://www.osp.ru/cw/2006/13/1154262/ (accessed January 3, 2008).
[41] "Education in Informatics at Sofia University" http://www.ics.heacademy.ac.uk/italics/vol6iss3/nikolov_ilieva.pdf
[42] „Prospects and challenges for cluster development – possibilities for implementing the cluster model in Romania" http://www.oecd.org/dataoecd/36/11/31798594.pdf (accessed January 3, 2007)
[43] http://www.microsoft.com/downloads/details.aspx?FamilyId=BB95083E-2BCA-4C60-832C-9B35A2A6BC6D&displaylang=en

considered, as there is no single answer or solution to this situation. When reviewing factor conditions, it becomes apparent that favourable and timely governmental policies still play significant role in improving the country's image needed for international investment and for normal functioning of domestic industry players. In this respect, Ukraine can learn from regional leaders, which in turn emulated best practices of mature international IT nations. First, clear-cut and balanced state strategy is needed in Ukraine to support the growing market, which, on one hand, has a critical set of attraction factors, but, on the other hand, suffers from weak business environment. Then, links with international markets can be easier achieved due to improved credibility rating. Thus, the work is to be done in two fronts: domestic and international, because a combination of strong players both local and foreign-owned ones poses as a more beneficial for the country's economy as a whole. While international companies serve as drivers most of the time (for policies, collaboration initiatives, etc), local firms are perceived as necessary for development of high-value added national products needed to maintain competitiveness in future. While Ukraine rates better in terms of market size, salary level, and potential for growth, it still has to catch up with Bulgaria and Romania when it comes to relevant educational policies, share of services and infrastucture to maintain favourable local and international demand. Therefore, the key to success is to be ready when the opportunity comes.

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