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COOPERATION AND PARTNERSHIP IN THE INNOVATION PROCESS: THE CASE OF THE INFORMATION TECHNOLOGY SECTOR IN LITHUANIA

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Abstract. The aim of the present research is to scrutinize how consistent and value-adding is the cooperation between Lithuanian information technology companies and educational organizations, intermediaries, government and other public or private market players in exercising innovative activities and allocating necessary human resources to one or another innovative project. Driven by the customer and competitor-focused view on the innovation strategy and being in general of small or medium size, Lithuanian information technology companies do not acknowledge the importance of openness to the environment. According to such an elaboration of thoughts, rather stronger sales, marketing and research efforts are offset by an inefficient organizational structure, a lack of financial and human resources as well as a modest expertise in introducing new management techniques. On the other hand, bringing different players under the same roof is an important, but not sufficient condition within the national system of innovation, as worse than bad players playing basketball individually are good basketballers having no knowledge and skills playing a team game. Therefore, firms need to respond to an intensified competition through improved cooperation aimed at sharing the tacit knowledge.

JEL classification: L860, F190.

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Reikšminiai žodžiai: nacionalinė inovacijų sistema, inovacijų strategija, inovacijų partneriai.

Introduction

The outlook of the Baltic countries depends on their abilities to take a full advantage of their own knowledge-based resources and especially of the creative energy of entrepreneurs who develop and generate the value-added to end-users through new products, services and processes. To play their strongest trump the Baltic states need to focus on such knowledge-intensive sectors as information technology (IT), and the capability to improve the competitiveness of different size IT firms largely

depends on the combination measures of innovation and human resource strategies within the company as well as the cooperation with other organizations while exercising innovative activities and projects. Lithuania should filter the best experiences of more economically developed countries and try to put them into practice without blindly copying. Driven by the assumption that conditions for the implementation of an innovation policy vary region by region, we need to focus on the cognitive approach of innovation on a case by case basis (Héraud, 2003). Though improved communications

have led to innovation networks with a rather shorter distance among members, there is still a cognitive process which includes a lot of tacit knowledge of using and interfacing this knowledge and requires closer contacts between the members of the network (Héraud, 2003).

The present article was mainly inspired by the results of a survey on the combination of innovation and human resource strategies in Lithuanian IT companies (2008), conducted by LEFI, the University of Lyon 2. It included the largest part of companies in Lithuania during the period 2004-2008, and its results derived by applying both the experience of other countries and the answers of the chief executive officers (CEOs) of Lithuanian IT companies. Of 130 enterprises selected, 92 valid responses were received to give a response rate of 71%, which translated to a standard confidence of ca. 95%. In addition to this survey, semi-structured interviews of 10 CEOs of Lithuanian IT companies (2009) were completed as a specific up-to-date to our survey.

Before conducting our survey, a present lack of national-level papers related to innovation strategies inside firms, particularly concerning the combination of innovation and human resource strategies in Lithuania, has encouraged us for an analysis of the existing literature on this topic in order to use the experience of other countries as well as practices in other Lithuanian sectors. Thus, we used the data derived from more than 20 surveys and reports such as 'Validating the Organizational Climate Measure: Links to Managerial Practices, Productivity and Innovation' prepared by British universities (2005), the UK Innovation Survey performed by Rob Stones (2001), 'Engaged Employees Inspire Company's Innovation' published in the Gallup Management Journal (2006), the U.S. Innovation Survey 'Are You Building Innovative Workplace' (2004), the BCG Senior Management Survey (2006), the Accenture Survey (2004) 'Innovation: Closing the Implementation Gap' and many others. The experience of the UK (2001, 2005 and 2006) has particularly contributed to a better understanding of the link between innovation and competitiveness.

1. Innovation Performance of Lithuanian IT Companies

Many economists admit that nowadays the behaviour of companies is determined by more sophisticated needs of the customers, stronger consolidation in the market as well as relatively shorter life-cycles of different products. To grow their profits, firms face the necessity to invest in research and development (R&D) and other innovation activities, to search for new expansion

opportunities as well as to tightly cooperate with private and public organizations in order to support the company's performance. Similar trends could be attributed to IT companies. According to Haudeville (2006), during the last centuries companies within various sectors are facing an increasing competition mainly driven by the appearance of new markets and new entrants to the existing markets as well as by a relatively faster process of updating and releasing products. These trends require strengthening both knowledge-based activities and internationalization (Haudeville, 2006).

It should be added that different development trends within the IT market are attributed to the differences in the size of companies (measured by their annual turnover). Given a robust organic growth in Lithuanian IT companies, our survey painted a not surprising IT structure based on the annual revenue in LTL: during the sample period, 54.3 % of all the interrogated companies have generated a turnover of up to LTL 1 million; 35.9% delivered the top line from LTL 1 million to LTL 50 million, which is already an impressive figure for the Lithuanian market; and 9.8% have managed to exceed LTL 50 million turnovers.

Having defined innovation activity as an introduction of a new or improved good, service or process, expenditure for or engagement in innovation projects or longer-term innovative activities as well as a formal cooperation with other organizations on innovation activities, we clearly see that, according to our survey, nearly 92% of enterprises were classed as being innovation-active in the period under investigation. What is more, large firms were more likely to engage in every form of innovation activity and encouraged innovations in more areas. Within a relatively low level of clustering in the Lithuanian IT market and not ingeniously developed innovative culture, Lithuanian IT companies lack formal cooperation on innovation activities with other enterprises or institutions. Not surprisingly, only one third of interrogated companies confirmed cooperating with other enterprises or institutions while exercising innovative activities (Figure 1).

2. Use of the Financial Aid from the European Union

Having proven the importance of financial resources as an opportunity to invest in R&D, another issue appeared in the Lithuanian IT sector: sample companies, particularly small and medium enterprises (SMEs), failed to use the financial aid from the European Union (the EU) during a four-year period. Given the knowledge economy and development of SMEs as the key areas within the

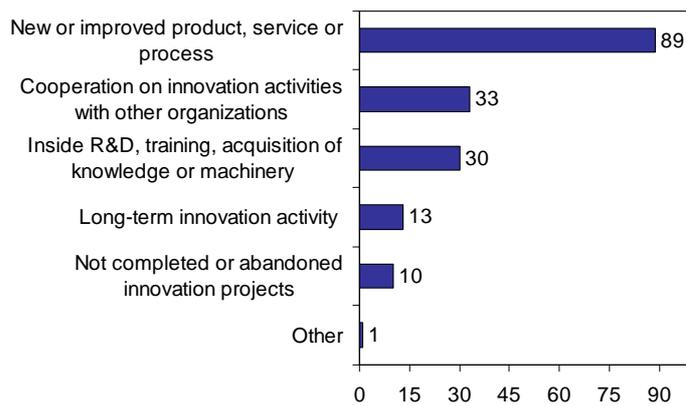


Figure 1. Most supported innovation activities during the period 2004-2008; by the number of answers

(Source: Survey on the combination of innovation and human resource strategies in Lithuanian IT companies; LEFI, University Lyon 2, 2008)

EU, our survey resulted in quite disappointing results regarding this matter. More than two thirds of the respondents stated that they have not used EU financial aid because they found it too complicated in terms of bureaucratic procedures and time. Other companies mentioned a lack of information on opportunities to be granted EU funds or low confidence in the institutions selecting projects as well as administering the flows of financial aid in Lithuania.

A low level of the use of EU financial aid was logically followed by a negative evaluation of Government performance in promoting innovative activities. Nearly 80% of interrogated companies evaluated Government work in promoting innovative activities as unsatisfactory, mainly due to low transparency, insufficient number of programs orientated to the establishment of a stronger 'industry-education' link as well as the improvement of institutional and legal base in order to enhance the innovation culture in Lithuania and to solve the 'brain drain' problem. In addition, many respondents think that the Government fails to put effective decisions into practice (Figure 2).

Though our complementary semi-structured interviews of 10 CEOs of Lithuanian IT companies (2009) have not brought any unexpected results, its value-added to our research is obvious. Being a specific up-to-date to the survey on the combination of innovation and human resource strategies in Lithuanian IT companies (2008), it confirms our previous forecasts on possible development trends within the IT market of Lithuania in the light of both recession and the first signs of the recovery of the Lithuanian economy.

Based on CEOs' observations, the year of 2009 was marked by a two-side effect. From one side, the companies admitted having better acknowledged the importance of the financial aid from the EU in order to survive in a highly competitive market; however, from the other side, the future outlook was clouded by insufficient finances to improve the cooperation with other organizations while exercising an innovative activity or rather weak efforts to implement new techniques of managing or diffusing knowledge.

The lack of information on opportunities to be granted financial aid by the EU or low confidence in Lithuanian institutions selecting projects as well as administering the flows of financial aid in Lithuania were mentioned by the interrogated companies. However, it is still possible to believe that we can witness a rather higher percentage of the use of the financial aid from the EU in the upcoming years. A perfect demonstration of the efforts of the state, educational organizations and companies to use the financial aid from the EU as well as to show a more intense cooperation in strengthening the Lithuanian national system of innovation is the establishment of integrated science, studies and business valleys, where some crucial innovations could be introduced, new high-tech

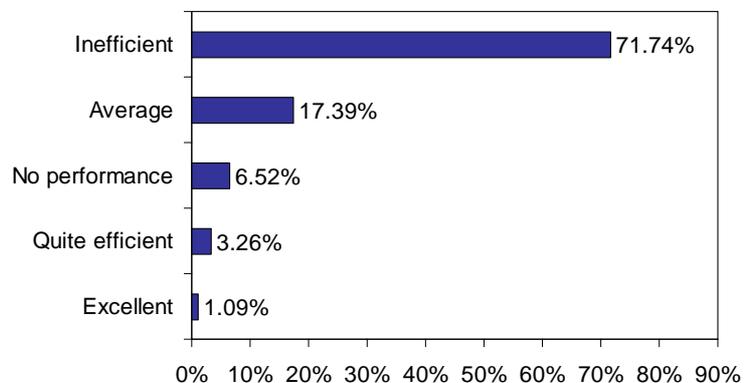


Figure 2. Evaluation of Government performance in promoting innovative activities during the period 2004-2008

(Source: Survey on the combination of innovation and human resource strategies in Lithuanian IT companies; LEFI, University Lyon 2, 2008)

companies could emerge and a high potential of qualified human resources could be efficiently used. The development of technology centres and science parks, the proliferation of regional cooperation between the business sector and universities, the expansion of university regional development strategies and regional networking of universities are all the examples of knowledge diffusion from universities to different regional levels (Héraud, 2003).

The disappointing results of transition in almost every country in terms of growth and *per capita* income are related to the incapability to supply the world market with high value-added products using their own resources which requires a highly skilled labour and technology content. In many occasions it depends on inefficient use of available resources.

This situation leaves great opportunities for a better allocation of scientific and technical resources and a better economic result. Technology transfer can be a masterpiece of such a process by the adoption of new successful research and development processes, the mobilization of resources on more efficient programs as well as the implementation of more efficient program management methods (Haudeville, 2003).

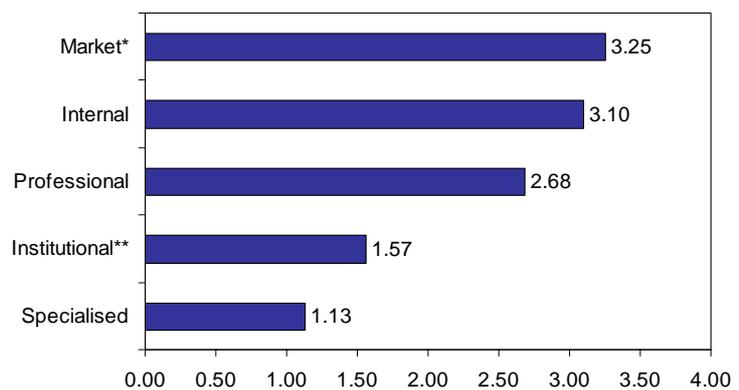
3. Relation to External Sources of Technology, Knowledge or Information

To identify the level of the combination of innovation and human resource strategies it is important to evaluate the enterprises' relation to external sources of technology, knowledge or information, as innovations are driven by a large set of factors. Companies need guidance, encouragement for their innovation activities from a variety of both public and private sources. Respondents of the present survey were asked to rank a number of potential sources on a scale from (0) 'Least important' to (4) 'Most important'.

With reference to the UK experience (2001, 2005) of organizing innovation surveys as well as innovation expertise within other countries, a mosaic containing four selected groups of sources could be created. *Market sources* include customers, clients, consultants, competitors, suppliers as well as commercial laboratories or R&D enterprises. *Institutional sources* should be defined as public organizations such as government research organizations, universities or private research institutes. *The main professional contributors* are: conferences, trade associations, publishers, fairs and exhibitions. These three groups need to be accompanied by *specialized sources*, where technical standards, health, safety, environmental standards and regulations appear to be crucial for innovation projects. The last but not the least is the group of *internal sources* such as an enterprise alone or other enterprises within the group of enterprises (Figure 3).

Both large firms and SMEs regarded internal and market sources being the most important for the information on innovation. Lithuanian IT companies ranked these sources at 3.10 and 3.25 respectively. This suggests that enterprises tend to rely on their own experience and knowledge backed by the information from suppliers, customers and clients. Of market sources, suppliers and customers were considerably more important sources of information on innovation (being cited by 83 and 88 companies respectively) than consultants or commercial laboratories (mentioned as important by 24 and 12 firms respectively). Operating in a highly competitive market, Lithuanian IT companies consider competitors as an efficient source for innovation, as 74 of 92 interrogated companies convinced learning from their competitors. Among other sources, professional sources (conferences, trade associations, press, fairs and exhibitions) were considered as efficient with a quite high score of 2.68. By far the least employed were institutional and specialized sources with the score of 1.57 and 1.13 respectively (Figure 3).

Of institutional sources, universities and higher education organizations were cited by more than a half of sample companies, while government research organizations and private research institutes were mentioned as important by 34 and 16 companies respectively. In addition, more than one third of interrogated firms indicated not employing institutional sources at all. Specialized sources with health and safety standards as well as environmental and technical standards were lowly rated mainly due to insufficient experience in the application of EU



*From suppliers, customers, clients, consultants, competitors, commercial laboratories or research and development enterprises

**From the public sector such as government research organizations and universities or private research institutes

Figure 3. Potential sources for innovations during the period 2004-2008; by the average of valuations on a scale from 'the least important' (0) to 'the most important' (4)

(Source: Survey on the combination of innovation and human resource strategies in Lithuanian IT companies; LEFI, University Lyon 2, 2008)

directives and standards in practice and relatively low accessibility to information related to financial aid to boost the innovation culture in a company (Figure 3).

Considering researchers as the product of universities or other educational and research institutions, as they possess knowledge necessary for a certain economy, knowledge diffusion can be understood as a supply chain of human resources for R&D. Therefore, the Government should pursue the promotion of effective education–industry/business relationship, such as integrated science, studies and business valleys, and better exploit knowledge in relationship with the industry as it could facilitate the dissemination of knowledge into IT companies, particularly SMEs.

On the other hand, the innovative performance of enterprises depends not only on the production of highly trained science and technology (S&T) human resources, but as well on a firm's capacity and willingness to integrate such human resources into innovative activities. To identify Lithuanian IT companies' capability to acquire necessary 'know-how' and human resources, first of all we tried to find out how many sample companies consider educational and research institutions important sources for innovation. To obtain tangible results we applied the ratio representing the use of sources for innovation related to education and R&D by the size of a company. This ratio varies from 0 (minimum) to 5 (maximum) and encloses the following sources:

- Consultants;
- Commercial laboratories/R&D enterprises;
- Universities/ higher education organizations;
- Government research organizations;
- Private research institutes.

In spite of the complexity and emerging nature of the Lithuanian IT sector, our survey has demonstrated a clear correlation between the use of sources related to R&D and education and the size of a company measured by the annual turnover. Companies with the annual top line of up to LTL 5 million indicated the ratio from 0.14 to 1.52, while relatively larger enterprises with annual revenues from LTL 5 million to LTL 50 million and above managed to deliver figures from 1.71 to 3.00. This makes us believe that larger firms have more financial resources allocated to innovation projects and are more competent to attract highly qualified human resources. It seems that larger firms have also a better understanding of all the benefits of

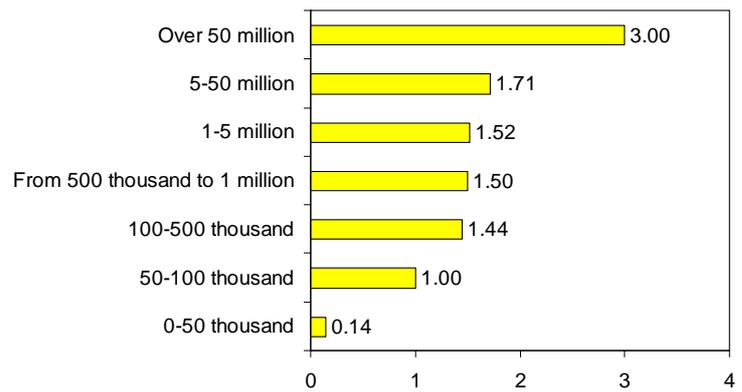


Figure 4. Ratio representing the use of sources for innovation related to R&D and education during the period 2004-2008, by the size of a company¹

(Source: Survey on the combination of innovation and human resource strategies in Lithuanian IT companies; LEFI, University Lyon 2, 2008)

cooperation with educational and research organizations (Figure 4).

4. The Main Impacts of Innovation

To improve competitiveness and profitability, enterprises face the necessity to innovate. Therefore, information about intermediate effects of innovation on the market position and internal processes and costs is particularly valuable. Respondents were asked to choose all potential effects that apply among three groups of factors: product-oriented ('Enhanced quality of goods or service', 'Larger portfolio of goods or services', 'Expansion to new market and larger market share'), process-oriented ('Improved production flexibility', 'Lower labour expenses', 'Increased capacity', 'Reduced production costs') and other factors ('Environment impact or health and safety aspects' and 'Applied regulations and standards'). Our survey has shown a strong relation between the main impacts of innovation and areas in which companies encourage innovations as well as innovation activities the sample companies carry on.

Generally, product-related impacts were more often cited than process-related impacts, with quality enhancements rated the highest (80 out of 92 companies marked 'Enhanced quality of goods or services', 68 sample firms cited 'Larger portfolio of goods or services', and 35 enterprises chose 'Expansion to new market and larger market share'). This suggests a strongly customer-focused approach to innovations (Figure 5).

Given a modest contribution from Lithuanian manufacturing and increasing importance of IT services, process-oriented factors ('Improved production flexibility', 'Lower labour expenses',

¹ Ratio varies from 0 (minimum) to 5 (maximum)

‘Increased capacity’, ‘Reduced production costs’) have been less frequently cited (76, 65, 30 and 5 out of 92 sample companies respectively). Thus, the least cited process-oriented impact was ‘Reduced production costs’, although this was more than twice as important for large firms as for SMEs. As we expected, ‘Environment impact or health and safety aspects’ and ‘Applied regulations and standards’ were among the least frequently indicated impacts of their innovation activities (Figure 5).

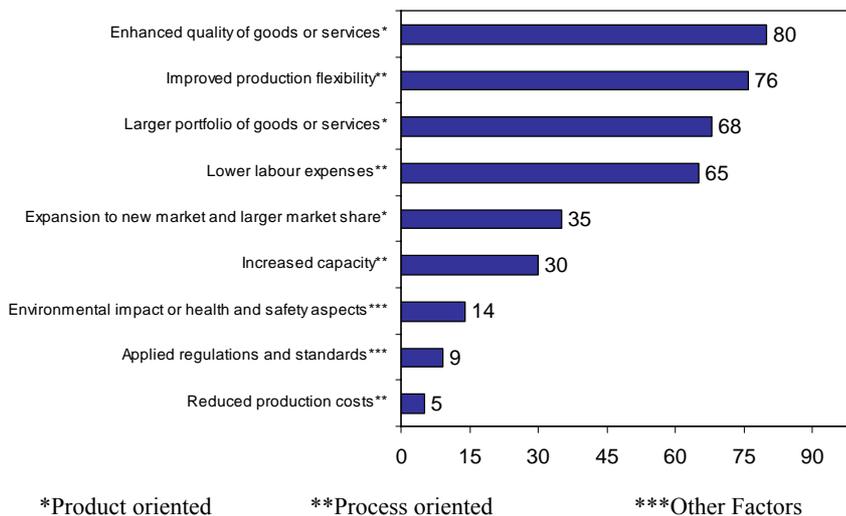


Figure 5. The main impacts of innovation during the period 2004-2008; by the number of answers

(Source: Survey on the combination of innovation and human resource strategies in Lithuanian IT companies; LEFI, University Lyon 2, 2008)

Though many economists admit that large firms, in comparison to smaller firms, innovate more and larger corporations have better resources and more market power (Schumpeter, 1942); small companies could often make the most groundbreaking discoveries. On the other hand, it is difficult to deny that the use of the technological opportunity depends on the access to R&D networks. Other authors, such as Fernández (1996), state that the number of innovation activities increases with the company's size mainly due to the economies of scale, lower risk, a larger market and greater opportunities for appropriation. In spite of quite different positions on the correlation between the size of a company and innovativeness, it is obvious that when the market dynamics, competition and concentration are imperfect, the equilibrium and direction of correlation between innovation activities and the size of companies can fluctuate.

Our survey has proven a strong correlation between positive impacts of innovation and the size of a company. We have introduced a ratio which represents the attribution of positive impacts to innovation based on the size of a company. Assuming that this ratio varies from 0 (minimum) to

7 (maximum), we have found out that large enterprises attributed a relatively higher impact to their innovation activities, possibly due to economies of scale and larger financial and human resources allocated to innovation projects. Companies with annual turnover of up to LTL 1 million delivered the ratio from 1.71 to 4.00, while sample firms with annual top line of LTL 1 million to LTL 50 million and over managed to reach solid figures from 4.74 to 6.00.

It should be added that apart from process, product and other impacts of innovation activities, innovation processes often lead to major changes in the companies' behaviour and business strategies, in addition to the technological change. With reference to our survey, a greater proportion of large firms were engaged in wider innovation than SMEs. Large companies were most likely to adopt new organizational structures, although a high proportion of companies were engaged in a change of the corporate strategy, while small and medium IT companies focused more on advanced management techniques. This is quite opposite to the situation in the Scandinavian region, where, in

general, advanced management techniques are least cited, while the change in corporate and marketing strategies as well as new organizational structures appear to be more important. Such results reveal the ongoing transformation of the Lithuanian IT market, as the most cited advanced management techniques are more urgent when companies rapidly emerge. This suggests that Lithuanian IT firms do not need to search for radical alternatives of growing their revenues, as a robust organic turnover growth attributes to all the companies situated at this point of the economic cycle.

5. Identification of the Main Partners within Innovation Activities

Despite rendering valuable information on innovation activities, the main sources for innovation and impacts of innovation, our survey has resulted in some complementary data related to the main partners within innovation activities. It is not surprising that the spread of the main partners within innovation activities was strongly correlating with the breakdown of innovation activities and areas in

which Lithuanian IT companies encourage innovations. In a product-oriented IT market, the majority of sample companies cited customers, suppliers, competitors and other enterprises within the enterprise group as the most important partners with 90, 85, 76 and 76 answers out of 92 interrogated companies respectively. A quite opposite situation has been revealed regarding the cooperation with educational and R&D-related institutions. Only a half of interrogated companies mentioned universities and education organizations among the main partners, and only less than one third of sample firms cited governmental research organizations and consultants. The situation looks even more demanding concerning the cooperation with commercial laboratories/R&D enterprises and private research institutes with 15 and 13 answers respectively. Applying the ratio representing the variety of partners within innovation activities by the size of a company (from 0 (minimum) to 9 (maximum)) our survey has failed to prove a strong interdependence between the size of a company (measured by the annual revenue) and the variety of partners.

A low level of cooperation with educational institutions has notably a negative impact on the combination of innovation and human resource strategies in Lithuanian IT companies as innovation activities require more qualified human resources to be allocated to innovation projects. Educational institutions appear to be important knowledge generators diffusing 'know-how' through its graduates. However, it is not the case in Lithuania, as both educational institutions and IT companies should act more efficiently in order to create a strong 'education-industry/business' link. So, do in Lithuania (ranked one of the best educated countries in the world) IT companies use available human resources efficiently?

Low cooperation with educational and R&D-related partners suggests those efforts being insufficient. It has also been well demonstrated by our survey, in which sample companies were asked to rank the cooperation with educational organizations while recruiting people on a scale from 'No cooperation' to 'Strong cooperation'. Survey results could not be called a positive surprise, as 38% of sample companies evaluated the cooperation with education institutions while recruiting people as average, while more than a half of interrogated

companies indicated cooperation with educational institutions while recruiting people being inefficient

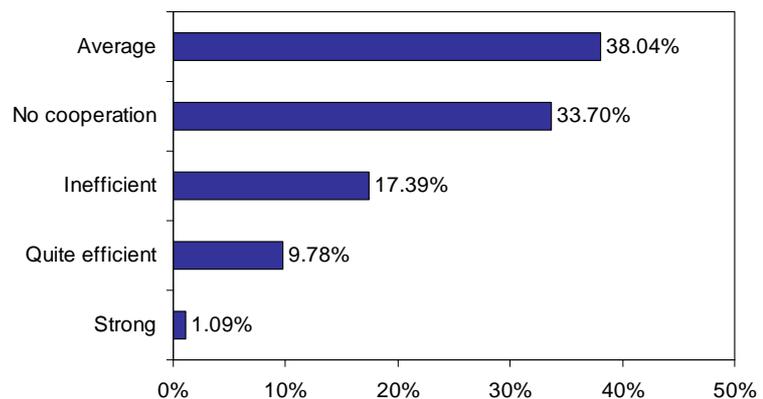


Figure 6. Cooperation with educational organizations while recruiting people during the period 2004-2008

(Source: Survey on the combination of innovation and human resource strategies in Lithuanian IT companies; LEFI, University Lyon 2, 2008)

or absent. Only 10% of the respondents selected the answers 'Quite efficient' and 'Strong' (Figure 6).

Contrary to the spread of partners by the company's size including the full list of answers, the ratio representing the variety of partners related to R&D and education appeared to be strongly dependent on the size of a company measured by annual revenues. Sample companies with the annual turnover of up to LTL 1 million attributed to ratios from 0.14 to 1.50, while larger firms with a top line from LTL 1 million to LTL 50 million and over managed to reach the figures from 1.52 to 3.44. Having a relatively more developed organization structure as well as more finances allocated to innovation activities, larger companies find it particularly important to maintain a strong partnership with actors related to R&D and education. In general, larger Lithuanian IT companies are closer to maturity point in the IT economic cycle; thus, not surprisingly, they search for new growth (both organic and structural) opportunities as well as focus more on better profit-margins. This could also be explained by the usage of more sources for innovation and better understanding of benefits derived from efficient partnership with organizations related to R&D and education (Figure 7).

Similar results have been obtained concerning the cooperation with scientific and technological parks, structures for start-up business support and service centers. Sample companies failed to successfully cooperate with scientific and technological parks, as nearly 70% of interrogated companies noted having no partnership with this group of actors or cooperation being inefficient. Nearly one third of the respondents managed to

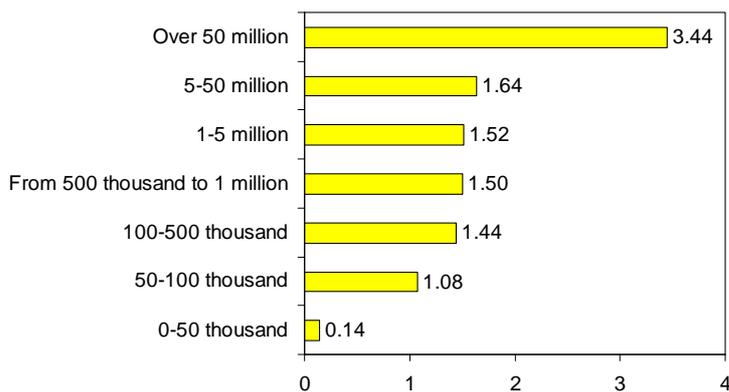


Figure 7. Ratio representing the variety of partners within innovation activities related to R&D and education; by the size of a company²

(Source: Survey on the combination of innovation and human resource strategies in Lithuanian IT companies; LEFI, University Lyon 2, 2008)

establish an average level of partnership, while an insignificant number of 3% were confident in their partnership with scientific and technological parks.

In countries with a well-developed national system of innovation, service centers play a crucial role while exercising various innovation activities. However, Lithuanian IT companies failed to form a strong partnership with service centers. According to our survey, 64.13% of the respondents evaluated this partnership as inefficient or absent, while only nearly one third of sample companies managed to form an average partnership with service centers. Only 5.43% of sample companies indicated closely cooperating with service centers. To continue, Lithuanian IT companies failed to cooperate with structures for start-up business support, as 65.22% of interrogated firms considered partnership with structures for start-up business support as inefficient or absent, while nearly one third of sample firms managed to get into an average level of partnership. As in previous cases of cooperation with intermediaries, only 3% of respondents cited the cooperation with structures for start-up business support being quite efficient or strong.

As we have already discussed, cooperation with various partners within innovation activities helps Lithuanian IT companies to efficiently use existing

financial and human resources through the circulation of necessary information, attraction of employees with high qualifications, sharing experience as well as designation of some important tasks of innovation projects to partners. Not surprisingly, a high level of cooperation with a larger number of partners results in higher value-added profit generated from R&D. Applying the ratio representing the variety of partners within the innovation by the value-added profit generated from R&D (varying from 0 (minimum) to 9 (maximum)) we arrived at the following findings: companies with the ratio from 5.58 to 5.75 managed to add a net profit from 3% to 10% and over from R&D; firms with the

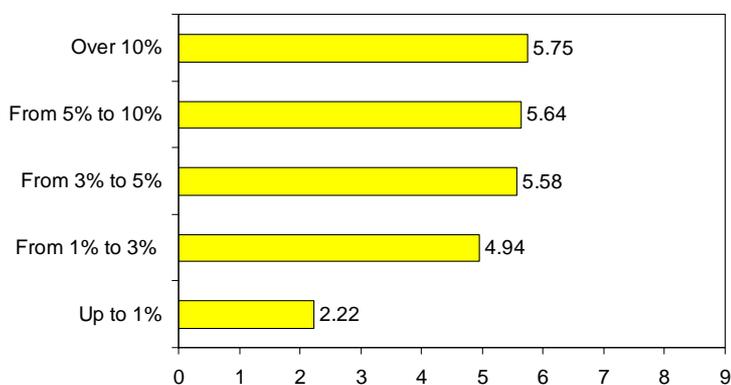


Figure 8. Ratio representing the variety of partners within innovation activities during the period 2004-2008, by the value-added profit generated from R&D³

(Source: Survey on the combination of innovation and human resource strategies in Lithuanian IT companies; LEFI, University Lyon 2, 2008)

ratio from 2.22 to 4.94 were able to generate an extra profit up to 3% from R&D (Figure 8).

Similarly to the ratio representing the variety of partners within innovation activities by the value-added profit generated from R&D, our survey has revealed a strong interdependence between cooperation with partners within innovation activities and the percentage of commercialized innovation ideas. Applying the ratio representing the variety of partners within innovation activities by the percentage of commercialized innovative ideas (which varies from 0 (minimum) to 9 (maximum)) we arrived at the following findings: companies with ratios from 5.39 to 5.44 managed to commercialize from 60% to over 80% of innovative ideas; firms with ratios from 4.73 to 4.74 were able to implement from 20% to 60% of innovative ideas; the lowest

² Ratio varies from 0 (minimum) to 5 (maximum)

³ Ratio varies from 0 (minimum) to 9 (maximum)

figure of 3.53 was attributed to firms with less than 20% of innovative ideas commercialized.

Of market sources, suppliers and customers were considerably more important sources of information on innovation (being cited by 83 and 88 companies respectively) than consultants or commercial laboratories (mentioned as important by 24 and 12 firms respectively). Operating in a highly competitive market, Lithuanian IT companies consider competitors as an efficient source for innovation. Among other sources, professional sources (conferences, trade associations, technical publishers or fairs and exhibitions) were considered as efficient with quite a high score of 2.68. By far the least used were institutional and specialized sources. Of institutional sources, universities and higher education organizations were cited by more than half of sample companies, while government research organizations and private research institutes were mentioned as important by 34 and 16 companies respectively.

The Government's intention to bring sciences, business/industry and all the intermediaries under integrated science, studies and business valleys could be a great booster for processes within the national system of innovation. However, we should not forget that more jeopardizing than the vacancy of innovative initiatives at different organizational levels, particularly inside of the companies, is a poorly nurtured attitude towards the importance of companies' openness to the environment as well as the development of innovation strategies through the use of highly qualified human resources. Therefore, it is necessary to start forming attitudes from early childhood and encouraging innovation processes through life-long learning.

The cognitive approach, applied by many economists, emphasizes a collective learning process (inside and outside the company) where an individual company acts as a knowledge processor with its particular competences. The skills needed to innovate are often a combination of newly created knowledge and better use of the existing knowledge. Not surprisingly, the companies' capacity to use knowledge for innovations is different and depends on many conditions. The competence of companies varies according to the type of innovation they are performing: competence in a science-based R&D, knowledge in marketing innovative products or innovation through learning by using (Héraud, 2003).

Conclusions

The volatile and dynamic IT sector of Lithuania is driven by a strong consolidation in the market and a severe competition, where the majority of firms are

young and far away from reaching maturity within the economic cycle. Not surprisingly, most of them are attractive acquisition targets for largely internationalized foreign companies. Entering the era where technologies are not anymore the accessory for business, but business is technologies and technologies are business, we can witness a shortening life cycles of many products or services, faster creation and introduction of innovations to markets as well as the apparition of new players and leaders. Many can meet the status of the leader among peers, but it gets a real challenge to maintain such a status.

To satisfy the expectations of highly demanding customers, many companies perceive the necessity to enter into stronger cooperation with other companies, educational organizations and intermediaries, in addition to understanding of the positive impacts derived from learning in a network. Companies need guidance, encouragement for their innovation activities from a variety of both public and private sources; however, the majority of companies under investigation regard only internal and market sources as important for information on innovation. In addition, large companies more often acknowledge the importance of openness to the environment.

Taking into consideration that Lithuanian IT companies are relatively young and demonstrate a robust organic growth, it is not surprising that the SMEs under investigation focus more on advanced management techniques, and large firms are most likely to adopt new organizational structures and engage in a change of corporate strategy. Given a relatively more developed organization structure as well as more finances allocated to innovation activities, larger companies find the initiation and maintenance of a strong cooperation with partners related to R&D and education of a significant importance. They search for new growth, both organic and structural, opportunities as well as focus more on better profit-margins rather than aggressive development of the top line.

Though the majority of companies under investigation identified direct innovation cost, the availability of finance and the cost of finance as factors constraining innovation performance, more than two thirds of respondents stated that they have not used EU financial aid mainly due to too complicated bureaucratic procedures, lack of information on opportunities to be granted and low confidence in Lithuanian institutions selecting projects and administering flows of financial aid in Lithuania. It is obvious that the Lithuanian Government has not done the maximum to promote innovative activities within the Lithuanian national

system of innovation, being late in bringing all the market players together.

Special attention should be paid to knowledge diffusion and sharing in order to avoid inefficiency of working together and putting innovative ideas into practice. It is tempting to believe that such initiatives will contribute to both a remarkable value-added and productivity in high-tech sectors. As a consequence, the establishment of a science-business-research trinity should largely pervade Lithuania's exports and improve the country's position in global markets. In the light of such a transformation, the Lithuanian Government should pay more attention and increase the expenditure on the protection of the intellectual property of Lithuanian innovators, which should result in a better image of the Lithuanian national system of innovation.

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ĮMONIŲ BENDRADARBIAVIMO SU INOVACIJŲ PARTNERIAIS YPATUMAI: LIETUVOS INFORMACINIŲ TECHNOLOGIJŲ SEKTORIAUS ATVEJO STUDIJA

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Santrauka. Šalies ekonomikoje dažnai reaguojama į tokias problemas kaip pasiūlos-paklausos disbalansas, masinės emigracijos bangos, sunkiai pažabojamas nedarbas ar infliacija, didėjanti valstybės skola, užsienio prekybos deficitas, ryškūs regioniniai skirtumai ir begalė kitų, kai prieinamas visiškas aklagatvis. Nepastačius nepajudinamų ekonominės tvirtovės pamatų, ekonomikos sunkmečio laikotarpiu telieka lopyti sienose atsivėrusius plyšius, o pamatų tvirtinimas žinių ekonomikos priemonėmis atidedamas geresniems laikams. Šiame straipsnyje nagrinėjami Lietuvos informacinių technologijų įmonių partnerystės su skirtingais inovacijų partneriais ypatumai. Siekiama įvertinti bendradarbiavimą su mokymo ir tyrimo įstaigomis, vyriausybiniomis organizacijomis, tiekėjais bei kitomis viešosiomis ir privačiomis partnerėmis, įgyvendinant inovatyvias idėjas bei efektyviai panaudojant finansinius ir žmogiškuosius išteklius.

Tai itin svarbu Lietuvos informacinių technologijų sektoriuje, kur didėjantys vartotojų bei klientų lūkesčiai, auganti konkurencija, trumpėjantys įvairių produktų kūrimo, pateikimo rinkai ir gyvavimo ciklai verčia keisti požiūrį į atvirumo aplinkai svarbą ir mokytis ne vien iš vartotojų, konkurentų ir tiekėjų, bet ir iš mokymo ir tyrimo organizacijų bei kitų šalių patirties. Toks bendradarbiavimas itin svarbus esant trapijai organizacinei struktūrai, finansų ir žmogiškųjų išteklių trūkumui bei menkai novatoriškų vadovavimo priemonių taikymo įmonėse patirčiai. Vis dėlto neužtenka suburti visus nacionalinės inovacijų sistemos žaidėjus po vienu stogu. Lygiai kaip ir krepšinyje, apmaudžiau už neįgudusį, pavieniui žaidžiantį krepšininką – dešimtis taiklių žaidėjų, neturinčių patirties ir gebėjimų žaisti komandoje. Tuomet neišvengiamai reikalingas aukščiausios kvalifikacijos treneris, gebantis suorganizuoti efektyvią žinių sklaidą ir išmokyti žaisti ir siekti rezultatų drauge.

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