

STRUCTURAL CHARACTERISTICS OF INNOVATION STRATEGIES OF FIRMS: INSTITUTIONAL AND SECTORAL EMBEDDEDNESS

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Abstract. The existing research provides little empirical evidence regarding the actual relationship of innovation strategies of firms and wider institutional and sectoral environments. Therefore, the paper is aimed at assessing the linkages between the characteristics of firms' innovation strategies and the firms' sectoral and institutional environment. Hence, the analysis is focused on two different national institutional environments – Lithuania and Switzerland – and, correspondingly, two industrial sectors – laser industry and contact centres. As a result, the innovation strategies are analysed and compared; then, entropy method is used in order to level down the external effects. The results reveal the sectoral and institutional specifics of the investigated firms; in addition, they highlight the aspects of innovation strategies which are most likely to fall under the firm's internal control despite the external institutional and sectoral environment.

Keywords: innovation strategy, institutional environment, industrial sector.

Jel classification: L10, L20, O32, P52

1. Introduction

While the notion of innovation strategy is widely used by the innovation practitioners, it is still difficult to clearly distinguish the concept from numerous research in the field of innovation studies, such as industrial districts (Goodman *et al.* 1989; Pyke, Sengenberger 1992), innovative milieus (Camagni 1991; Ratti *et al.* 1997), new industrial spaces (Scott 1988), local nodes in global networks (Amin, Thrift 1992), clusters (Porter 2000; Bathelt *et al.* 2002; Malakauskaitė, Navikas 2011), sectoral systems (Malerba 2002), regional innovation systems (Doloreux 2002), national systems of innovation (Lundvall 1992; Nelson 1993), varieties of capitalism (Hall, Soskice 2001), business systems (Whitley 1999), and technological systems (Jacobsson, Johnson 2000). However, not only the concept of innovation strategy has remained understructured (Bathelt 2003), but the research has mainly endured fragmented as sensitive to current external circumstances as well (Tvaronavičienė *et al.* 2009; Stankevičė 2011).

Hage (2003) and Coriat and Weinstein (2002) distinguish between two dominating approaches to the innovation strategies of firms – the *institutional* and *organisational* one. The *institutional* approach supports the idea that institutional environment is an important factor underlying the nature and structure of a firm's innovation strategy (Hollingsworth 1997; Hall, Soskice 2001; Hall,

Sobel 2005; Lewin, Volberda 2005; Casper 2009). The second – *organisational* approach – emphasises the organisational factors and the sectoral effects as decisive in firm's innovation strategy (Håkansson, Snehota 1995; Sarkar *et al.* 2001; Malerba 2002; Herrmann 2008; Lange 2009). However, due to the diversity of approaches to innovation strategy and the lack of conceptual scrutiny within them, both scholars and practitioners are confronted with at least two difficulties. The first one concerns the distinction of elements of innovation strategies, which can be best presided over (i.e. controlled) by firms. The second difficulty regards assessing the elements of strategies, which are most likely to be influenced by the sectoral and institutional factors. Thus, the paper **aims** to assess the linkages between the characteristics of firms' innovation strategies and the firms' sectoral and institutional environment.

While considering the significance of institutional and sectoral environment to innovation strategies, the case analysis is focused on two different national institutional environments – Lithuania and Switzerland – and, correspondingly, two industrial sectors – laser industry and contact centres. Hence, the object of the empirical research is focused on companies, which represent this institutional-sectoral intersection: a Lithuanian laser producer, a Swiss laser producer, a Lithuanian contact centre, a Swiss contact centre.

The paper starts out by providing a discussion on the theoretical aspects of institutional and sectoral effects on innovation strategy as well as its characteristics. The empirical part, first of all, provides the comparative analysis of actual innovation strategies. Then, the entropy method is applied in order to identify the prevailing aspects of the firms' innovation strategies, under the conditions of (theoretical) absence of institutional and (or) sectoral effects. Such analysis enables us to identify the aspects of innovation strategies that are least influenced by the institutional and sectoral environment. As a result, the firms may focus on the aspects of their innovation strategies which are under their control. At the same time, other actors of wider institutional and sectoral environment can better perceive the important (yet often neglected) aspects of firms' innovation strategies that fall under their (in) direct influence.

2. Theoretical background

Below, we reveal why institutional and sectoral effects on innovation strategies of firms should be considered relevant to its formation and implementation. We then conceptualize the innovation strategy of a firm, which is based on previous theoretical insights and research (Hambrick, Fredrickson 2005; Stankevičė, Jucevičius 2010; Stankevičė 2011).

2.1. Institutional effects on innovation strategy

There are a number of scientific arguments and evidence for the idea that institutional environment is a decisive factor determining the character of innovation strategy of a firm originating and operating (largely) in that particular institutional environment. For instance, the key assumption of the varieties of capitalism approach (Hall, Soskice 2001) is the comparative institutional advantage. It implies that firms focus on innovation strategies which are supported by the dominant institutional framework, typically – the national one (Casper 2009). A clear example of that are Whitley's (2000) five different innovation strategies which are most likely to appear in certain market economies.

The approach of national systems of innovation (Lundvall 1992; Nelson 1993) confirms the idea of comparative institutional advantage, though it is more specialized in respect of industrial sectors (Amable 2000). The notions of regional innovation systems (Doloreux 2002; Cook, Memedovic 2003) and other geographies of production, such as industrial districts (Pyke, Sengenberger 1992), innovative milieus (Camagni 1991), new industrial spaces (Scott 1988) and clusters (Porter 2000; Bathelt *et al.*

2002), are allied to those of varieties of capitalism and national systems of innovation because they not only emphasize that the core of production is still heavily concentrated in particular regions and that globalization does not necessarily lead to deterritorialization, but support the assumption that local capabilities are, to some extent, always dependent on national opportunities (Bathelt 2003; Fromhold-Eisebith 2007).

Other scholars support the paradigm of comparative institutional advantage by stressing its importance to factors which are closely related to innovation strategy of a firm. For instance, Hall and Sobel (2005) suggest that differences in institutional quality help to explain differences in entrepreneurship across states. Koen's (2005) international comparative analysis proves the significance of national institutional environment to competitiveness and innovativeness. The ideas are supplemented by Thomsen's (2008) research in transition and post-transition economies. Boyer and Hollingsworth (1997) state that competitiveness is partly determined by institutional environment: many firms (e.g. German or Scandinavian) and regions (e.g. Italian) have proved being enduringly competitive without import of foreign principles because of the generous respective institutional environments. According to the institutionalization theory (Lewin, Volberda 2005), environments with dominating technical and economic demands favour effectiveness and novelty: thus, revolutionary or radical innovations (Freeman, Soete 1997) are welcome. And contrarily, environments with dominating social demands favour organizations for an endorsement of values, rules, and trust: here, evolutionary innovations are more suitable. Analogously, if economic environment is benevolent, an organization can afford concentrating on expensive technological innovations (Edquist *et al.* 2001). Otherwise, organizations often confine themselves to value innovations, though precisely the latter ones were considered to be an essence of any innovation by Drucker (2007).

To sum up, admittance of the idea of comparative institutional advantage leads to a conclusion that innovation strategy is "path dependent, locally embedded and institutionally shaped" (Köhler 2008).

2.2. Sectoral effects on innovation strategy

On the other hand, the concept of comparative institutional advantage is seriously questioned by a number of scholars (Amable 2000; Deeg, Jackson 2007; Herrmann 2008; Lane 2008; Lange 2009). Lane (2008), in view of global production and innovation networks, argues that, under the impact of global markets, the notions of national

institutional reproduction and comparative institutional advantage need to be re-conceptualized to reflect the complexity of global effects. Similarly, Amable (2000) suggests that the approach of social systems of innovation is superior to that of comparative institutional advantage.

Hage (2003) and Coriat and Weinstein (2002) distinguish between two predominating approaches towards innovation strategies of firms – institutional and organisational one. Among the notions supporting the organizational approach, the strongest is that of sectoral systems (Malerba 2002). Despite the recognition of the significance of national institutions, the proponents of the institutional approach admit that there are important differences among industries in the operation of innovation-related processes (Fagerberg *et al.* 2009). For instance, in pharmaceuticals, collaboration with universities, codified knowledge and formal tools for protection of intellectual property are vital, while in such fields as, for example, construction these factors are less important than interaction with customers and suppliers, learning and confidentiality. Sarkar *et al.* (2001) performed an analysis of managers in high-tech industries and ascertained that, in more science-driven sectors, such as biotechnology or laser industry, relationships with private research organizations, universities, state research institutes, and non-profit organizations are hardly inseparable from innovative activity.

Another line of the related research is actor-network theory (Callon 2002). Its contribution is to demonstrate that not only can innovation networks facilitate innovation, but they also constrain it by determining the kind of innovations which are generated, their subsequent interpretation and final use. Hence, in order to produce certain strategically significant innovations, firms are under the necessity of finding proper partners (Radziszewska–Zielina 2010). Moreover, the firms should restrict the number of relationships maintained: Keršys (2008) shows that the influence of the number of a firm's partners on its innovative capacity grows with the number of partners, but falls down steeply, if the number of partners exceeds the interval between 10 and 20 partners.

The markets-as-networks approach, developed by Håkansson and Snehota (1995), supports the idea of the necessity to find proper partners. The participants in the network of innovation develop specific bonds, which have an organizing effect on the network and innovations produced (Fagerberg 2005). This statement can be illustrated by Vinding's (2002) findings. He surveyed 548 innovative manufacturing firms and found that the im-

port of collaboration on innovation is significantly related to both the type of partner and the pattern of previous collaborative relationships. Moreover, domestic partners were found to have a greater positive impact on innovative performance than foreign ones.

To finalize, if the choice and number of partners are essential for innovative activity, sectoral embeddedness of innovation strategies of firms is inevitable.

2.3. Innovation strategy at closer range

Innovation-related literature, according to Hage (2003), has largely remained conceptually frozen around the ideas of *radical vs incremental* (Rossi 2002) and *product vs process* (Schmookler 1966; Edquist *et al.* 2001). Obviously, these dichotomies are not sufficient enough to be referred to as innovation strategies. Unfortunately, they often are (Stankevičė, Jucevičius 2010; Stankevičė 2011).

Therefore, this paper relies on an integrated conceptual framework of innovation strategy, developed by Stankevičė and Jucevičius (2010) and refined by Stankevičė (2011). Reasoning behind the framework is as following: *radical vs incremental* (Rossi 2002), *product vs process* (Schmookler 1966; Edquist *et al.* 2001), *open vs secretive* (Srivastava 2006; Visser, Atzema 2007), *novelty vs imitation* (Markard, Truffer 2006; Jakubavičius *et al.* 2008; Huang *et al.* 2010), etc. are not a strategy; to be a strategy, these types of innovation and characteristics of innovation need to be structurally and purposively interconnected.

The methodology for the composition of the model rests on the application of the conceptual model of strategy, developed by Hambrick and Fredrickson (2005) within the area of general strategic management, to relevant studies on innovation. The model is comprised of five elements: four of them represent the varieties of possibilities about what to innovate, how to enable innovation, the speed and the scope of innovations, and how to bring innovations to target customers; the fifth element represents the general logic of innovation strategy and ensures the viability of the link between all the elements, between the objectives and the content of the innovation strategy, and between the innovation strategy and the respective general strategy.

Based on the framework, the respective aspects of innovation strategy were distinguished in order to implement the envisaged survey.

3. Methodology

In order to intersect the institutional and sectoral effects on innovation strategies of firms, a sample size of at least four firms was required. The two imperious institutional environments were represented by Lithuania and Switzerland, while the two sectors - by laser producers and contact centres. Given the topic of the paper, the distinction between Lithuania and Switzerland in terms of innovation performance is essential: according to Summary Innovation Index, innovation performance in Switzerland is steadily one of the best, differently from Lithuania (Pro Inno Europe 2011). The choice of the sectors was not accidental either: the sample stands for service firms and high-tech firms – the distinction considered important by a number of scholars (Sarkar *et al.* 2001; Fagerberg *et al.* 2009).

The representatives of the sample companies had to assign relative percentages from 0 % = “Not true at all” to 100 % = “Completely true” in integral numbers only to statements of the research instrument. Each statement stood for a certain aspect of innovation strategy, hence, the representatives evaluated to which extent each aspect was present in the respective innovation strategy. Three of the representatives filled in the questionnaires which they had previously got by-emails. The problem of missing information was solved by either a structured interview by telephone (primary source), or e-mail, or Skype. One of the four representatives preferred a structured face-to-face interview to other means of contribution.

On purpose to highlight the aspects of innovation strategy of a firm which are the most prevailing regardless of external effects, such as institutional and sectoral ones, entropy method was employed. The method originated from the field of rare event simulation, where very small probabilities need to be accurately estimated (Rubinstein 1997). The probability, that either sectoral or institutional effects on innovation strategies of firms can be neglected, is very small, therefore the method is suitable for our purpose.

To implement the method, five matrixes of initial data were designed: a matrix including all the sample companies; a matrix including the laser producers from the different countries; a matrix including the contact centres from the different countries; a matrix including the Swiss firms from the different sectors; and a matrix including the Lithuanian firms from the different sectors. In each case, the horizontal axis (criteria) stood for aspects of innovation strategy, and the vertical axis (alternatives) represented the relevant sample firms. The matrixes of initial data were normalized

into matrixes of non-dimensional values. The normalization was performed according to equation (1):

$$P_{ij} = \frac{X_{ij}}{\sum X_{ij}}, \quad (1)$$

where:

P_{ij} – non-dimensional normalized value,

X_{ij} – initial value,

$\sum X_{ij}$ – sum of initial values in the column of the initial values.

The level of entropy of each criterion (aspect of innovation strategy of a firm) was measured by equation (2):

$$E_j = -\frac{1}{\ln m} \sum \bar{p}_{ij} \cdot \ln \bar{p}_{ij}, \quad (2)$$

where:

E_j – level of entropy of a criterion,

\bar{p}_{ij} – value of a member of a normalized matrix,

m – number of considered alternatives.

In this paper, $m = 4$ for the first calculation, and $m = 2$ for all the other four calculations. Then, the level of entropy change of each criterion was measured by equation (3):

$$\bar{d}_j = 1 - E_j, \quad (3)$$

where:

\bar{d}_j – level of entropy change of a criterion,

E_j – level of entropy of a criterion.

Finally, theoretical significance of each criterion was estimated (4):

$$\bar{q}_{j(t)} = \frac{\bar{d}_j}{\sum \bar{d}_j}, \quad (4)$$

where:

$\bar{q}_{j(t)}$ – theoretical significance of a criterion,

\bar{d}_j – level of entropy change of a criterion,

$\sum \bar{d}_j$ – sum of levels of entropy change of all the criteria.

In order to avert uncountable values, 0 were transformed into 0.000001. The results were validated by summarizing the theoretical significances of all the criteria, thus getting 1 = 100 %. All the calculations were performed via *Microsoft Office Excel 2007*.

4. Empirical findings

Below the findings are presented. First, we compare the investigated actual innovation strategies. Then, in order to highlight the aspects which are the most prevailing in any innovation strategy, we do it by deducting the institutional and sectoral effects.

4.1. The actual innovation strategies: a brief comparison

The Swiss laser producer distinguished 14 aspects of innovation strategy which were superior to the other ones: they attained the highest scores and ordained the strategy to the greatest extent. The goal of the innovation strategy is ternary: to both generate new products, maintain the existing positions and satisfy customers' needs. The innovation strategy is aimed at generating products and improving the organization of work, resulting that the company finds it extremely important to offer completely new products which are regarded to as radical and revolutionary innovations. Therefore, beyond the company's boundaries, its innovation strategy contributes to creation of positive external economies, e.g. fostering innovation networks, as well as to formation of markets, and creation and diffusion of new knowledge. The firm's aspirations towards leadership can be explained by the fact of medium level of competition within the sector – this aspect is considered important to the innovation strategy by the Swiss laser producer. Finally, the company's competitiveness in innovative activity is procured by its attitude towards R&D. It is based on partnerships and outsourcing, therefore, the firm's value chain is, naturally, disintegrated. Consequently, knowledge for innovation-related activity comes from external local sources mainly.

The Lithuanian laser producer distinguished only 8 characteristics of innovation strategy which attained the highest scores. Similarly to the Swiss laser producer, the Lithuanian one's innovation strategy is aimed at creating completely new products and modifying the existing ones. Hence, the innovation strategy's goal is twofold: to offer new products and maintain existing positions. However, the innovation strategy of the Lithuanian firm is somehow detached from customer satisfaction, probably leaving this aspect to the marketing strategy. The level of competition within the sector is considered high, therefore, the firm's approach towards R&D can be described as "control, build and develop". The Lithuanian laser producer, duplicately to the Swiss one, beyond the company's

boundaries, contributes to creation of positive external economies, and creation and diffusion of new knowledge. However, the high competition barriers off the formation of new markets.

The Swiss contact centre distinguished 9 characteristics of innovation strategy which tip the scale to the greatest extent. Level of competition is high within the sector, therefore the company's innovation strategy is primarily aimed at maintaining existing positions. While doing so, the contact centre's innovations lie in improvement of organisation of work and processes. Relationships with customers and clients are supposed to be extremely important to the character of the company's innovation strategy. When R&D is needed, the Swiss contact centre relies on partnerships and outsourcing, and the company's collaborative arrangements include both single relationships and global partnerships and R&D hubs across the industry. Knowledge for innovative activity comes predominantly from external local sources, similarly to the pathway of the Swiss laser producer.

In case of the Lithuanian contact centre, there were 13 characteristics of innovation strategy with the highest scores. Despite the appreciable high level of competition within the sector, the Lithuanian contact centre's innovation strategy is aimed at creation of novelty and maintaining existing positions, identically to the Lithuanian laser producer's innovation strategy. Hence, beyond the firm's boundaries, its innovation strategy contributes to creation and diffusion of new knowledge. However, novelty is produced due to the development of organisation of work and processes, like in the case of the Swiss contact centre. Similarly, relationships with customers and clients are supposed to be very important. The company's collaborative arrangements are more multiple than those of the respective Swiss contact centre and include both single relationships, multilateral collaboration along the value chain, and global partnerships and R&D hubs across the industry. For the innovation strategy of the Lithuanian contact centre, sources where knowledge for innovative activity comes from are important, alike the Swiss laser producer. However, Lithuanian institutional environment cannot brag for its extensive network of intermediate institutions (Časas, Dambrauskaitė 2011), therefore the Lithuanian contact centre uses knowledge from internal sources and multiple globally external sources, and not external local sources.

Table 1 summarizes the most expressive aspects of the analyzed innovation strategies.

Table 1. The most expressive formative aspects of the analyzed innovation strategies

	CH laser producer	LT laser producer	CH contact centre	LT contact centre
Goal of innovation strategy – generating products/services	+	+		+
Goal of innovation strategy – maintaining existing positions	+	+	+	+
Goal of innovation strategy – satisfying customers' needs	+			
Innovations lie in modifications of existing products / services		+		
Innovations lie in creation of completely new products / services	+	+		+
Innovations lie in improvement of organization of work	+		+	+
Innovations lie in improvement of processes, including the technological ones			+	+
Innovations are radical	+			
Innovations are revolutionary	+			
Beyond the company's boundaries, its innovation strategy contributes to creation of positive external economies	+	+		
Beyond the company's boundaries, its innovation strategy contributes to formation of markets	+			
Beyond the company's boundaries, its innovation strategy contributes to creation and diffusion of new knowledge	+	+		+
Level of competition within sector is medium	+			
Level of competition within sector is high		+	+	+
Attitude towards R&D - partnerships and outsourcing	+		+	
Attitude towards R&D – “control, build and develop”		+		
Value chain is disintegrated	+			
Knowledge for innovation-related activity comes mainly from internal sources				+
Knowledge for innovation-related activity comes mainly from external local sources	+		+	
Knowledge for innovation-related activity comes mainly from multiple globally external sources				+
Relationships with customers and clients are extremely important			+	+
Collaborative arrangements are based on single relationships			+	+
Collaborative arrangements are based on multilateral collaboration along the value chain				+
Collaborative arrangements are based on global partnerships and R&D hubs across the industry			+	+

As it can be seen from the table above, the sets of the most expressive formative aspects of the analyzed innovation strategies are rather unique and hardly comparable in line with either sectoral or institutional embeddedness only. This is due to the fact that each of the innovation strategies represents a unique intersection of sectoral and institutional external effects, in addition to the internal specifics. Which aspects are the most important formative elements of an innovation strategy when sectoral and institutional effects are neglected, is demonstrated in the next section.

4.2. The most important formative aspects of an innovation strategy: institutional-sectoral omission

The results show that, when both institutional and sectoral effects on innovation strategy are neglected, the most important its formative elements are: customer satisfaction as the goal of the strategy, medium level of competition, and relationships with state-funded research institutes (7.08 % each). Then, relationships with firms from other than own sectors are important (4.89 %). Revolutionary innovations and external local sources of knowledge for innovations arrived at the third place (4.78 % each). The fourth important are relationships with private research organisations, and R&D as creation and development (3.83 % each). Then, innovative marketing (3.75 %) and R&D as

“control, build and develop” (3.7 %) follow. These are the top 10 criteria of innovation strategy which are the most important to its formation. The bigger variety of criteria is presented in Fig. 1 and accounts for 45.45 % of all the elements of the conceptual framework of innovation strategy.

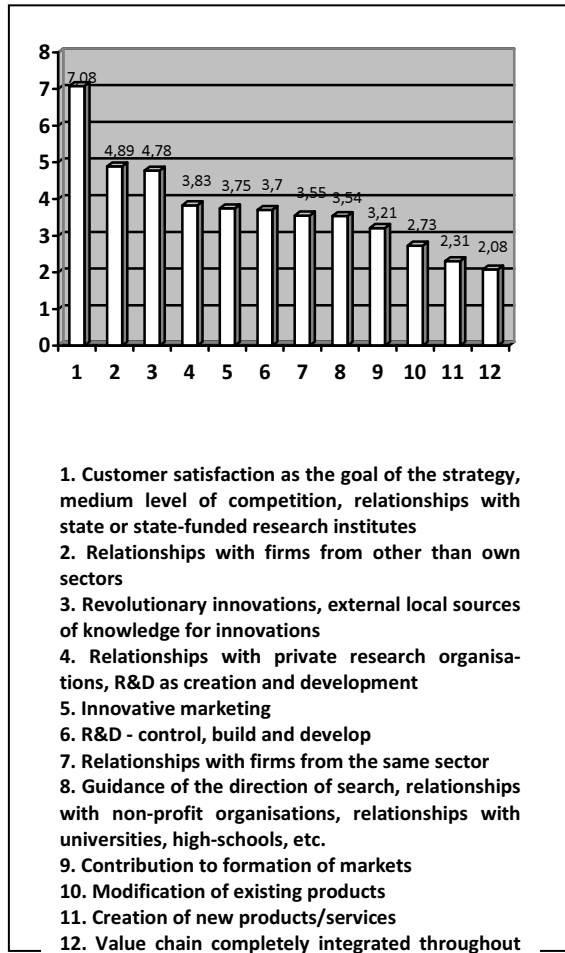


Fig.1. The most important formative elements of IS: institutional and sectoral effects neglected

Resulting from Fig. 1 and the previous analysis of the four innovation strategies, we find out that some of the elements of an innovation strategy which were supposed to be important to it and, consequently, should have been present in it to a large extent, are absent or given a lower level of significance in reality than in theory. They are innovative marketing, relationships with state or state-funded research organisations, private research organisations, firms from both the same and other than own sector, R&D as creation and development, completely integrated value chain throughout the whole process of value creation. Some of the important aspects cannot be easily controlled by the companies themselves: the desired medium level of competition within a sector or external local sources of knowledge for innovation-related activity. For instance, Lithuania cannot brag for having the latter

aspect well-developed, especially in respect of contact centres. Hence, these results show that, if sectoral and institutional effects were possible to remove, the four innovation strategies would encompass a little different from the existing ones sets of aspects.

When the institutional effects are neglected within the laser industry, there are 12 aspects which account for 6.844 % each and are, thus, the most significant to innovation strategies of the investigated firms. The goal of an innovation strategy is customer satisfaction: this is logical that the laser producers care for their customers because the specifics of products offered make every single customer or client a sufficient source of income. Relationships with state or state-funded research institutions, external consultants and other firms in the same sector are also considered important. Attitude towards R&D can be described as both “control, build and develop” and “build and buy”, differently from what the Swiss laser company does in practice in this regard and partly different from what the Lithuanian laser producer does. As to the theoretically most preferable value chain, it can be either completely integrated throughout the whole process of value creation or convergent within the respective industry. Again, it passes the reality. What is also missing in the actual innovation strategies of the laser producers is innovative marketing and innovations of processes of production. Still, the two companies are competitive and quite successful. Finally, the preferred level of competition within the sector can vary from medium to high, thus fostering innovative activity.

When the institutional effects are neglected within the area of activity of contact centres, there are 14 the most significant aspects which account for 6.71 % each. Surprisingly, the preferable elements of an innovation strategy do not correspond to those existing in practice at all in the Swiss case. It could be explained by the lowest level of competitiveness of the Swiss contact centre in comparison to the other three companies, therefore, its actual innovation strategy is still alien to the desired one. In theory, the preferred and most important aspects of an innovation strategy are: the goal of the strategy is either new products or services, or their modifications; an innovation strategy should contribute to creation and diffusion of new knowledge, and formation of markets; a company should innovate products or services and, thus, offer completely new products or services to markets; marketing is important, but it can be both traditional and innovative; sources of knowledge for innovations can be both internal and multiple globally external; the most preferable type of a

company’s collaborative arrangements is global partnerships and R&D hubs across the industry; attitude towards R&D – either “control, build and develop” or “build and buy”; relationships with other firms from the same sector are considered important. As to the Lithuanian case, five of the aspects reflect the practicalities: the strategy is aimed at generating new products, it contributes to creation and diffusion of new knowledge, the sources of knowledge for innovations coincide; however, the Lithuanian contact centre does not distinguish any single type of collaborative arrangements.

When sectoral effects are neglected in Switzerland, 25 aspects, equally significant to an innovation strategy of an organisation, were distinguished. Each of them accounts for 3.839% of the total distribution of the elements of the conceptual framework of innovation strategy. Hence, it can be presumed that Swiss institutional environment is equally favourable to distinct innovation strategies of firms, regardless of sectors where they operate. Following elements were distinguished: goal of an innovation strategy (new products/services, modification of existing ones, customer satisfaction); the strategy contributes to creation and diffusion of knowledge, guidance of the direction of search, and formation of markets; completely new products/services are created and innovated in the revolutionary way; marketing is important – both traditional and innovative; source of knowledge for innovations is also relevant (internal, external local

and multiple globally external); the preferable type of collaborative arrangements – global partnerships and R&D hubs across the industry; value chain is either completely integrated throughout the whole process of value creation or convergent within the respective industry; the level of competition within sectors varies from medium to high; escalated relationships with companies from other than own sectors, private research organisations, non-profit organizations, external consultants, and universities, high schools, etc.

Lithuanian institutional environment seems to be more restrictive: 9 the most significant aspects of an innovation strategy were accentuated and accounted for 8.357 % of the total distribution of the aspects each. Regardless of the sectoral subjection, Lithuanian institutional environment favours innovation strategies which guide the direction of search, offer revolutionary innovations, implement innovative marketing, are designed to bucket knowledge for innovations from local external resources, and maintain strong relationships with firms from other sectors, private research organisations, non-profit organizations, state or state-funded research institutions, and universities, high schools, etc. As it can be observed, the Lithuanian and Swiss institutional environments encourage relationships with almost identical types of partners, being out of sync in respect of only external consultants (the Swiss case) and state or state-funded research institutions (the Lithuanian case).

Table 2. The most expressive formative aspects of an innovation strategy: institutional-sectoral omission

	Both institutional and sectoral effects (I-S) neglected: top 10	Institutional effects (I) neglected in the industry of laser producers (LA)	Institutional effects (I) neglected in the industry of contact centres (CC)	Sectoral effects (S) neglected in Swiss institutional environment (CH)	Sectoral effects neglected (S) in Lithuanian institutional environment (LT)
1	2	3	4	5	6
Customer satisfaction as the goal of the innovation strategy	+	+		+	
New products and (or) services as the goal of the innovation strategy			+	+	
Modifications of existing products and (or) services as the goal of the innovation strategy			+	+	
Medium level of competition	+	+		+	
High level of competition		+		+	
Relationships with state or state-funded research institutes	+	+			+
Relationships with firms in the same sector		+	+		
Relationships with firms from other than own sectors	+			+	+
Relationships with external consultants		+		+	

End of table 2

1	2	3	4	5	6
Relationships with universities, high schools, etc.				+	+
Relationships with private research organisations	+			+	+
Relationships with non-profit organisations				+	+
Innovations of processes of production		+		+	
Innovations of products and (or) services			+	+	
Completely new products or services are offered to markets			+	+	
Revolutionary innovations	+			+	+
Internal sources of knowledge for innovations			+	+	
External local sources of knowledge for innovations	+			+	+
Multiple globally external sources of knowledge for innovations			+	+	
R&D as creation and development	+				
R&D as “build and buy”		+	+		
R&D as “control, build and develop”	+	+	+		
Innovative marketing	+	+	+	+	+
Traditional marketing			+	+	
Value chain is completely integrated throughout the whole process of value creation		+		+	
Value chain is or convergent within the respective industry		+		+	
Innovation strategy contributes to creation and diffusion of new knowledge			+	+	
Innovation strategy contributes to formation of markets			+	+	
Innovation strategy contributes to guidance of the direction of search				+	+
Collaborative arrangements – global partnerships and R&D hubs across the industry			+	+	

If to compare the five sets of the aspects – when both institutional and sectoral effects are neglected, when institutional effects are neglected in laser industry, when institutional effects are neglected in the sector of contact centres, when sectoral effects are neglected in Swiss institutional environment, and when sectoral effects are neglected in Lithuanian institutional environment, – only one of the aspects appears to be among the most significant preferable constituents of an innovation strategy of an organisation throughout all the five cases – innovative marketing (3.752 %, 6.844 %, 6.710 %, 3.839 % and 8.357 % respectively). However, if to broaden the categories of comparison from separate aspects to the groups of aspects, two elements of innovation strategy of an organisation would be among its most significant constituents (Fig. 2).

Hence, marketing and relationships with different types of partners are the most significant formative aspects of an innovation strategy of an organisation, common to all the five cases. As it can be observed from Fig. 2, their levels of significance are almost equal.

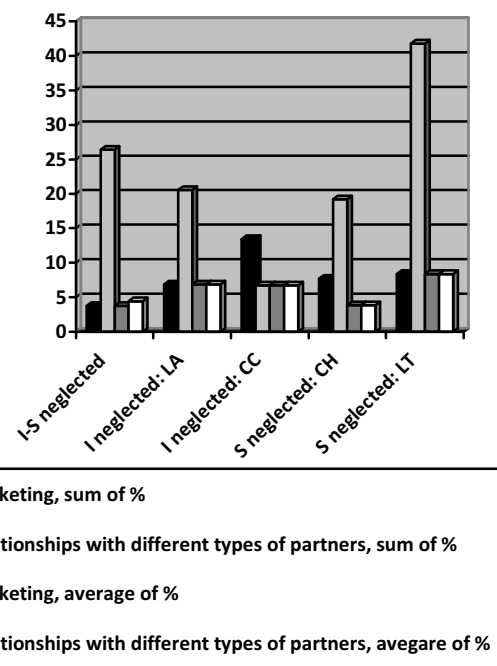


Fig.2. The most significant constituents of an innovation strategy of an organisation: integral neglect

Here, it is important to note that relationships with different types of partners account for higher cumulative percentage because the number of the types is bigger within the respective category than the number of types of marketing. The latter was only brought under the two possibilities – either traditional or innovative. However, once again one can assure of the providence of Porter's (1990) "competitiveness diamond" model, of which supporting industries and factor conditions can be paralleled with the relationships with different partners; on the other hand, Porter's (1990) demand conditions allude to marketing; finally, everything is interconnected within the respective innovation strategy. Nonetheless, one cannot ignore the other important elements of an innovation strategy: their essential roles unfold in specific sectoral and institutional intersections.

5. Conclusions

The analyzed innovation strategies are rather one-off and hardly comparable along the theoretical dimensions of sectoral or institutional environments. It is due to the fact that each of the innovation strategies represents a unique intersection of sectoral and institutional external effects, in addition to the internal specifics.

Still, as far as the institutional embeddedness is concerned, the Swiss firms benefit from the use of external local sources for innovations. In the Lithuanian case, the respective innovation strategies do have some common points; however, they are not exclusive to the Lithuanian firms only. With regard to sectoral subjection, the laser producers' innovation strategies can be distinguished for their substantial ability to contribute to the creation of positive external economies. The exclusive common features of the contact centres are that their innovations lie predominantly in improvement of processes, and relationships with customers and clients are extremely important. The recent findings can firmly be substantiated by the sectoral specifics.

The further analysis has shown that the less successful a firm is, the less its actual innovation strategy corresponds to the respective visionary innovation strategy, when institutional and (or) sectoral effects are neglected. This situation is clearly illustrated by the Swiss contact centre. In the context of the theoretical significance of aspects of innovation strategies of firms, it is also worth noting that relationships with firms in the same sector are considered important, regardless of institutional embeddedness; and institutional environment, in turn, supports innovation strategies which contribute to guidance of the direction of search, without

respect to their sectoral subordination. Finally, irrespective of both institutional and sectoral environment, innovative marketing and relationships with partners are the factors to which any innovation strategy is able to appeal in the most proper way.

The paper poses a number of challenges for further research. For instance, though customer satisfaction and level of competition are among the most important aspects of the innovation strategies of firms, the Lithuanian institutional environment provides little support in this respect. Moreover, it is less favourable to the diversity of innovative activities of firms compared to the Swiss case. At the same time, paradoxically, the Lithuanian institutional environment appears to promote the innovation strategies that are based on local external resources; however, these resources are less elaborated and accessible than in the case of Switzerland. As far as the sectoral dimension is concerned, it is important to note that laser producers, in contrast to the existing trends, should pay more attention to innovation of the processes of production, whereas contact centres are insufficiently concerned with innovations of their services in more novel ways.

Notwithstanding, there is a limitation in the conclusions provided above. The sample represents a limited number of both institutional environments and sectors; therefore one should avoid overgeneralizations by transposing the results onto other countries than Lithuania and Switzerland, and onto other sectors than laser industry and contact centres. However, in addition to numerous implications to the sample background, the paper represents a fine framework of the analysis, which can be applied in other contexts as well.

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