

SUPPORT OF SME'S IN THE BALTIC SEA REGION THROUGH CENTERS OF EXCELLENCE

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Abstract. Small and medium-sized enterprises are the backbone of the economy in the Baltic Sea Region, also creating most new jobs and registering most new patents. To stay competitive, the companies must exploit their innovation potential. This asks for a stronger cooperation between the businesses and the research organisations, which can be achieved through so called “Centers of Excellence”. Starting from the 90's in Europe, many centers of excellence (CoE) and disciplines have been created practically in all areas. Although the concept of a center of excellence is often used, it is still rather ambiguous. Each organization could be recognized as a “center of excellence” as long as it attracts and comprises various parties such as researchers, enterprises, research units. The paper provides the concept of centers of excellence and its basic prerequisites to perform. It also briefly elaborates on a recent study showing which sectors or industries could be core areas for such centers and highlight concrete possible measures that can be realized in such centers.

Keywords: SMEs, innovation, centers of excellence, clusters.

Jel classification: M1, M14, M20.

1. Introduction

The economy around the Baltic Sea Region consists of more than 99 % of small and medium-sized enterprises (Wymenga, Spanikova 2011). In the last ten years, since 2002 about 85 % of all new jobs have been created by SMEs in the region (de Kok, Vroonhof *et al.* 2011). Nevertheless, the traditional strong economy in the area is facing an increasing competition from similar companies in other parts of the world. In particular, countries in South America or Asia discovered the benefit of strong SMEs in the recent years and undertook several measures to promote their businesses (Lukacs 2005). One of the biggest challenges for SMEs in developing countries is still the lack of skilled labour (Robertson 2003), although leading to inexpensive production but not of a high quality. Thus a competition versus

low labour cost countries can only be successful among companies from high cost countries in eastern and particular northern Europe, if they are more innovative and are able to offer better products and services. There are no unanimously defined measures for innovation, however, the most common one is the amount of capital invested in R&D (OECD 2002). The statistics show that countries, where more money have been input in R&D, have recovered from the crisis much faster than the ones, where funds were decreased (Cichacz 2012). A clear example is Finland, that launched its center of excellence programme already in 1995 and is rated as one of the most innovative countries (Park 2005). However, SMEs often lack behind large enterprises in regard of innovation. Large enterprises generally keep their own research departments while SMEs are often too small to run own research departments and suffer from limited access to research institutions (financial and non-financial barriers). In particular the knowledge, that can be obtained from the cooperation with R&D institutions, can be the crucial element for the economic success of a small company (Huggins *et al.* 2009). Consequently an effective promotion of innovation in SMEs intensive cooperation between enterprises and universities is of the utmost importance. Indeed, this cooperation is now extremely weak and in need of sustainable strengthening. A close cooperation between enterprises and R&D oriented institutions is required, long-term relations and networks that can be created in forms of so called “Centers of Excellence” (CoE). Such cooperation structures are well known within major industries and multinational corporations (Frost *et al.* 2002), but hardly known when it comes to SMEs.

2. Centers of excellence

Starting from the 1990's in Europe, many centers of excellence have been setup practically in all areas and disciplines. Although the concept of a center of excellence is often used, it is still rather ambiguous. Intuitively, each organization may be recognized as a “center of excellence”, when it comprises and attracts excellent actors (eg. researchers, companies or others), earning a reputation as a significant resource for the progress of science and technology and the spread of innovation. The common understanding of a CoE is provided by Stickler (2008) that it is “*a team of people that promote collaboration and use best practices around a specific focus area to drive business result*”. Also Craig *et al.* (2009) define it as “*a premier organization providing an exceptional product or service in an assigned sphere of expertise and within a specific field of technology, business, or government, consistent with the unique requirements and capabilities of the COE organization*”. CoE's activity includes mainly conducting basic and applied research, implementation of projects and research programs as well as conducting educational activities, service and training.

Some key features, which are part of the CoE concept, can be identified. Each centre of excellence should be characterized by¹:

- a “critical mass” of high level scientists and/or technology developers;
- a well-identified structure (mostly based on existing structures) having its own research agenda;
- an ability to integrate related disciplines or complementary skills, necessary to achieve strategic goals; a capability of maintaining a high rate of exchange of qualified human resources; a dynamic role in the surrounding innovation system (adding value to knowledge);
- high levels of international visibility and scientific and/or industrial connectivity; a reasonable stability of funding and operating conditions over time (the basis for investing in people and building partnerships);
- and finally by sources of finance, which are not dependent over time on public funding.

Depending on the scope of activities, there are five different types of centers of excellence. First type of COE focuses on conducting research, often done by the faculties of colleges and institutes, in a one specific area. The most famous example of this type of CoE is the MIT-Harvard Center of Excellence for Cancer Nanotechnology. It is a collaborative effort among MIT, Harvard University, Harvard Medical School, Massachusetts General Hospital, and Brigham and Women's Hospital. It focuses on developing a diversified portfolio of nanoscale devices for targeted delivery of cancer therapies, diagnostics, non-invasive imaging, and molecular sensing. Other, well-known examples of monodisciplinary centre of excellence are the Isaac Newton Institute for Mathematical Sciences in Cambridge or a non-academic CoE i.e. Institute for Transuranium Elements in Karlsruhe. A second type of CoE is a center, in which a broad interdisciplinary cooperation takes place. One example can be Institut Supérieur des Hautes Etudes in Paris, which leads multidisciplinary projects, requiring the cooperation of many partners from different disciplines. The third type of CoE is based on specific research infrastructure such as for example CERN (The European Organization for Nuclear Research), where work almost 8,000 scientists, using the world's largest and most complex scientific instrument (the particle accelerator). The last type of CoE are these, that focus on developing the industrial implementation of R&D. The best known practices are from Philips Research Laboratories in Eindhoven, where over 8000 researchers, developers, and entrepreneurs cooperate closely together in developing future technologies and products. One of the most important success factors for a small or medium-sized company is the human or social capital (Felicio *et al.* 2012), but following this is the capability to innovate, to research and develop new services or products. A CoE offers small or medium sized companies the opportunity to either

¹Centrum Doskonałości, http://www.kpk.gov.pl/centra_doskonalosci/index.html

start R&D at all – or if they have invested in it already, outsource a part of it to these institutions. It has been shown, that businesses who are willing to outsource these tasks show indeed a higher level of collaboration (Fontana *et al.* 2006).

3. Cooperation in CoEs

The successful cooperation in Centers of Excellence and its sustainable operation will primarily depend on the concrete benefits that can be offered to the companies and R&D institutions. The main challenges for establishing a successful centre result from varied aims and interests actors have. On the one hand, universities focus more on research work, owning research infrastructure while companies' interest is to increase profits. Naturally, universities have a longer time schedule for their work, while SMEs expect solutions in a short-time frame. A hindrance in some cases can surely be the limit of workforce in SMEs. Most SMEs are indeed micro companies with less than 10 employees, which makes it very difficult to name one representative to communicate on a continuous basis with the universities and report the companies needs and progress.

The key to a successful centre of excellence therefore lies in the inclusion of intermediary bodies that have a constant contact to individual companies or a group of businesses and can forward the needs and information between the firms and the researchers. Such intermediary bodies can be business chambers, since it is their very own interest to support their regional companies and network them with other relevant stakeholders.

The CoE needs be developed based on a regional level, whereas the regions should define clearly their sectorial/industrial specialization and their strongest areas, instead of focusing on improving weaknesses. Differentiation and individualism brings in cooperation outstanding results as every member has different ideas and points of view because of their previous experience (Cichacz 2012). However, it is important not to try to equal and make everybody the same, as it is quite contradictory to the purpose of the international collaboration.

A main focus in the work within a centre surely is the urgently needed transfer of know-how (Heimer 2007). In a cluster the stakeholders can cooperate when it comes to the development of new training courses or study programmes to qualify personnel in the future, but also work together in terms of concrete research and development tasks. Often the latter can be combined as part of a bachelor or master thesis of a student or in more complex matters a technical solution can be worked on as part of a graduates' doctoral thesis. Besides vertical cooperation from SMEs to customers, suppliers and other enterprises, these horizontal cooperations play an important role for the innovation process in SMEs (Zeng *et al.* 2010).

4. Thematic scope and clustering

Centers of excellence need to focus on specific sectors to create an added value. Cluster development initiative is an important new direction in the economic policy of the regions, aiming on building stabilization on a bigger scale, market enlargement, and reducing the costs of doing business. Clusters became a solution as a perfect catalysing tool which supports the progress of marketing strategies (Cichacz 2012). Clusterization can have a particular impact for small and medium-sized enterprises and boost their innovation capability (Navickas *et al.* 2009). For the Baltic Sea Region a study has been conducted in 2012 (Grzesiak *et al.* 2012), concentrating on three sectors: the traditional strong construction sector, the fast growing sector of renewable energy and the rather soft skilled sector concerning personnel and organisational development.

Asked about their preferences, the majority confirmed the biggest interest in Centers of Excellence focusing on the Personnel and Organisational Development, (Figure 1). In fact, this topic has an enormous potential for innovation in SMEs in the Baltic Sea Region (Odenrick 2012).

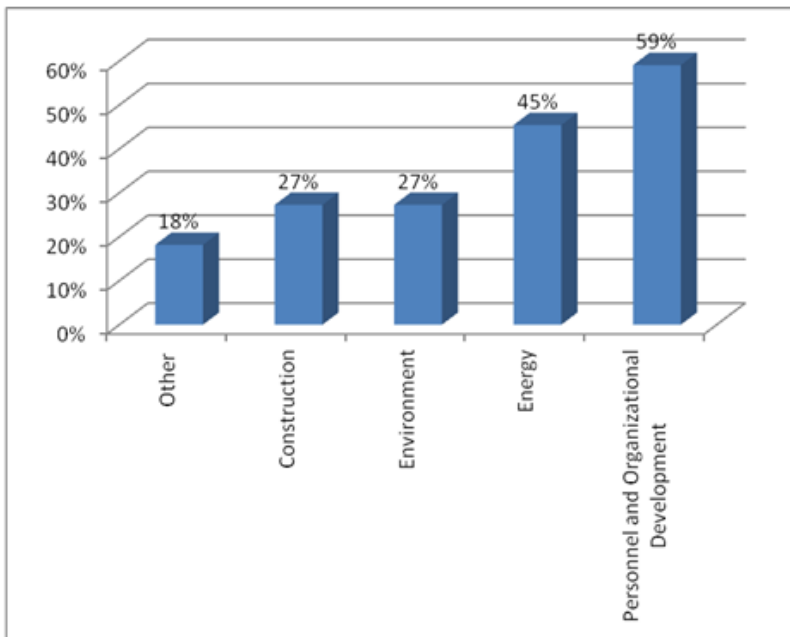


Fig. 1. Respondents opinion on CoE research sectors

In the same survey, respondents were asked what benefits they expect from CoE participation. It is interesting to see that 77% of them expect participation in joints projects (e.g. R&D, other EU). Also, little more that 70 % expect the development of innovation support for SMEs. Almost 60 % look forward to benefit by development of further vocational training for SMEs. Approximately 40 % of sur-

veyed institutions expect benefits such as cooperation in technology and knowledge transfer whereas 36 % of them would expect benefits in terms of cooperation with research experts, (Figure 2).

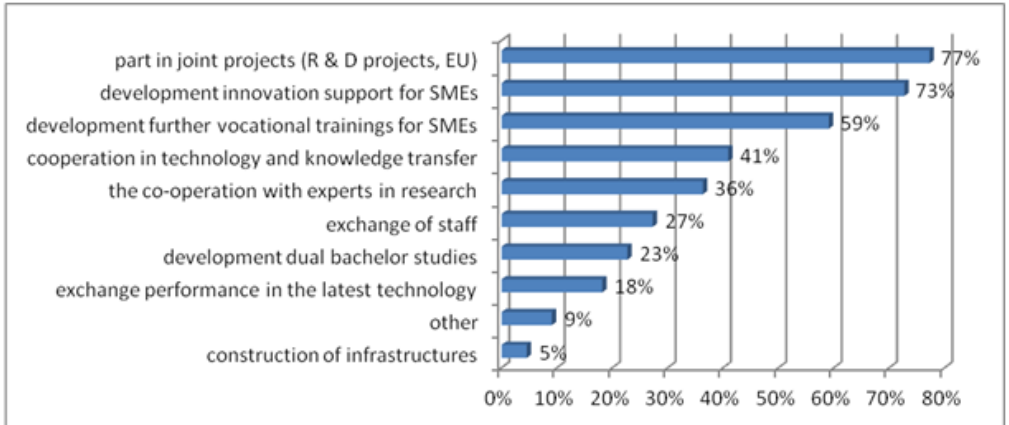


Fig. 2. Respondents expectation from CoE participation

It is evident, that the cooperation in the framework of a CoE is most important for the stakeholders concerning the common implementation of R&D projects and development of innovation support for the companies.

5. Parameters for a CoE

The successful creation of a CoE depends on several factors. As a starting point joint conferences can bring together representatives from universities, SMEs and chambers to facilitate the first contacts. In order to unite the parties and build up trust, these conferences usually include sessions with smaller working groups where the representatives of different institutions can exchange knowledge and experiences and where they can start to get to know each other. In most cases, the level of trust correlates to the willingness of the SME owners regarding a potential collaboration and thus is of high significance (Brunetto *et al.* 2007). In order to improve the cooperation between universities, chambers and SMEs every institution needs on central contact person.

First of all, the information about the right contact person for outside parties must be available. This requires that there is one central contact person or department in each institution. If an institution has agreed upon one central contact person, they must build up awareness within the institution. All employees must know about this position and have to use it. An organogram could be developed for this purpose with relevant information about the positions, names of the contact persons and their responsibilities.

Crucial in the first steps of establishing a center is not only to identify the right stakeholders, but also to reach the critical mass of participating companies and institutions to be really able to deliver the demanded results of the cooperation. It is questionable though, if CoE can be established in a bottom-up process or need initial financial support from government that realises the needs to bundle the essential stakeholders in their regions to secure the competitiveness of their economy on a global scale.

6. Conclusions

SMEs in the Baltic Sea Region are essential for a healthy growth in all European countries. To stay competitive, the companies need more promotion when it comes to developing innovative solutions. This requires a cooperation between universities and firms, mediated by business chambers. A successful way of improving the cooperation between universities and SMEs lies in the establishing of centres of excellence that focus on concrete topics. It is arguable though, how Centres of Excellence should be created. Should these emerge and grow organically, out of the interested parties engagement or rather be subject to strong innovation policy support acting on many levels, providing required resources.

References

- Action for “centers of excellence” with a European dimension. Available from Internet: <<http://ec.europa.eu/research/era/pdf/centres.pdf>>.
- Brunetto, Y.; Farr-Wharton, R. 2007. The Moderating Role of Trust in SME Owner/Managers' Decision-Making about Collaboration, *Journal of Small Business Management* 45(3): 362–387. <http://dx.doi.org/10.1111/j.1540-627X.2007.00218.x>
- Centrum Doskonałości. Available from Internet: <http://www.kpk.gov.pl/centra_doskonalosci/index.html>.
- Cichacz, K. 2012. Strategy for innovation in regional policy, Hanse-Parlament. Available from Internet: <<http://www.bsr-quick.eu/23.html>>.
- Ciesielski, M. 1994. Konkurencyjność w gospodarce światowej. Przegląd problemów. Gdańsk: Wydawnictwo Uniwersytetu Gdańskiego.
- Craig, W.; Fisher, M.; Garcia, S.; Kaylor, C.; Porter, J.; Reed, S.L. 2009. Generalized Criteria and Evaluation Method for a Center of Excellence: A Preliminary Report. Carnegie Mellon, Engineering Institute. Available from Internet: <<http://www.sei.cmu.edu>>.
- de Kok, J.; Vroonhof, P.; Verhoeven, W.; Timmermans, N. 2011. Do SMEs create more and better jobs? Available from Internet: <http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/pdf/do-smes-create-more-and-better-jobs_en.pdf>.
- Felicio, J.; Courto, E.; Caiado, J. 2012. Human Capital and social capital in entrepreneurs and managers of small and medium enterprises, *Journal of Business Economics and Management* 13(4): 395 – 421. <http://dx.doi.org/10.3846/16111699.2011.620139>

- Frost, T. S.; Birkinshaw, J. M.; Ensign, P. C. 2002. Centers of excellence in multinational corporations, *Strategic Management Journal* 23: 997–1018.
<http://dx.doi.org/10.1002/smj.273>
- Fontana, R.; Geuna, A.; Matt, M. 2006. Factors affecting university–industry R&D projects: The importance of searching, screening and signaling, *Research Policy* 35(2): 309–323. <http://dx.doi.org/10.1016/j.respol.2005.12.001>
- Grzesiak, M.; Olczyk, M.; Starnawska, M. 2012. Centers of Excellence – concept. Internal document. Available from Internet: <<http://www.bsr-quick.eu/23.html>>.
- Heimer, A. 2007. Know-how-transfer durch international Forschungs- und Entwicklungs-Kooperationen, *Wissenstransfer und Innovationen rund um das Mare Balticum*: 162 – 171.
- Hogeforster, M. 2012. Center of Competence for Innovation Support of SMEs in the Baltic Sea Region. Available from Internet: <<http://www.bsr-quick.eu/23.html>>.
- Hyduke, S. 2006. Polskie Centra Doskonałości szansą w globalnej konkurencji, in Polska i Unia wobec wyzwań globalizacji, Biała Księga.
- Huggins, R.; Johnston, A. 2009. Knowledge Networks in an Uncompetitive Region: SME Innovation and Growth, *Growth and Change* 40: 227–259.
<http://dx.doi.org/10.1111/j.1468-2257.2009.00474.x>
- Lukacs, E. 2005. The economic role of SMEs in world economy, especially in Europe, *European Integration Studies* 4(1): 3–12.
- Matusiak, K. B. 1999. Dylematy strategii technologicznej i poprawy innowacyjności gospodarki polskiej, *Studia Prawno-Ekonomiczne* LX.
- Navickas, V.; Malakauskaite, A. 2009. The impact of clusterization on the development of small and medium-sized enterprise (SME) sector, *Journal of Business Economics and Management* 10(3): 255–259. <http://dx.doi.org/10.3846/1611-1699.2009.10.255-259>
- Odenrick, P. 2012, Workbook for cooperative development of personnel and organisation for innovation in SMEs, SME relevant sectors in the BSR, *Baltic Sea Academy Series* 5, 11–55.
- Park, S.; Lee, S. 2005. The national and regional innovation systems in Finland: from the path dependency to the path creation approach, *AI & Society Volume* 19(2): 180–195.
<http://dx.doi.org/10.1007/s00146-004-0305-2>
- Pleśu, A. 1997. Centers of excellence in Central and Eastern Europe, *European Review* 5(4): 429–435.
- Reger, G. 2004. Coordinating globally dispersed research centers of excellence – the case of Philips, *Journal of International Management* 10(1): 51–76.
<http://dx.doi.org/10.1016/j.intman.2003.12.004>
- Robertson, P. 2003. The role of training and skilled labour in the success of SMEs in developing economies, *Education and Training* 45(8/9): 461–473.
<http://dx.doi.org/10.1108/00400910310508856>
- Sticker, J. 2008. What is a Center of Excellence. Available from Internet: <<https://agileelements.wordpress.com/2008/10/29/what-is-a-center-of-excellence/>>.
- Williams, P. 2011. Innovation centers of excellence. American Institute for Innovation Excellence. Available from Internet: <<http://thinkforachange.com/wp-content/uploads/2011/05/2011-02-CoE-Research-Report-Formatted-Draft.pdf>>.

- Wymenga, P.; Spanikova, V.; Derbyshire, J.; Barker, A. 2011. Are EU SMEs recovering? Annual Report on EU SMEs 2010/2011 for the European Commission. Available from Internet: <http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/files/supporting-documents/2010-2011/annual-report_en.pdf>.
- Zeng, S.; Xie, X.; Tam C. 2010. Relationship between cooperation networks and innovation performance for SMEs, *Technovation* 30(3): 181–194.
<http://dx.doi.org/10.1016/j.technovation.2009.08.003>

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