

An Investigation of a new Concept of World-Class Clusters in Europe – A Case Study of the Visegrad Group of Countries

Bialic-Davendra Magdalena

Abstract

Nowadays, in order to successfully compete on a global level, it has become crucial for clusters to search for new alternative solutions to enable them stay competitive. One of these solutions is the need for the creation of a wider scale of networking – which is where the new idea of “clustering the clusters” appears. This paper aims at investigating the development of a new concept of World-Class Clusters and inter-cluster collaboration in Europe with focus on the Visegrad Group of countries i.e. Poland, Czech Republic, Slovakia and Hungary. The type and subject/area of clusters’ cooperation is one of the focal points. Hence, this paper conducts a detailed examination of the reasons why certain clusters are willing to cooperate (the benefits of collaboration) while others are not interested in this type of collaboration at all (restrictions, barriers of collaboration). Additionally, the positive (opportunities) and negative (threats) aspects of inter-cluster cooperation are distinguished.

Key words: Clusters; World-Class Clusters; inter-cluster collaboration; Europe; Visegrad Group countries (V4)

1 INTRODUCTION

The literature describes the Marshall’s industry districts, Perroux’s theory of growth poles, the theory of industrial location of Weber and Hoover, or path dependence theory which had an influence on a cluster concept development (Marshall, 1920; Blasiak-Nowak, 2007). Over the past decades numerous clusters definitions were formulated. Among them the one which revolutionalized and popularized cluster concept development around the World, was Porter’s description of a cluster as a geographical concentration of interrelated companies, specialized suppliers, service providers, business operating in similar sectors as well as related institutions which collaborate and compete as well in a particular field and which are linked by commonalities and complementarities (Porter, 1990; Porter 2000). Also Rosenfeld interpretation of a cluster as a “geographically bounded concentration of interdependent business with active channels for business transactions, dialogue, and communications, and that collectively shares common opportunities and threats” underlined the core of a cluster existence (Rosenfeld, 1997, p. 10). CLUNET Policy Guidelines Report characterizes clusters as “flexible networks of small and large companies that complement each other, enhanced by research, development, qualification institutions and additional centers of competence that build competitiveness thanks to close supply linkages and cooperative relationships” (PRO-INNO Europe, n.d., p. 2). Additionally, they occur due to proximity to markets, in the presence of specialized labor, inputs (natural resources, information) and equipment/service suppliers, and due to the availability of infrastructure (OECD, 1999).

A cluster simply joins all essential “ingredients” – the availability of resources and goals of individuals in order to achieve competitive success, and shares the idea of proximity, networking and specialization.

Clusters stimulate and revitalize cooperation in the business environment. They stimulate competitive pressure even among indirectly competing or non-competing participants (Porter, 2008). Through increasing competitiveness and performance of companies, innovation incentive (e.g. effective R&D, support of spin-offs, attracting foreign investments etc.), they enable to stimulate economic development of national economies (Pavelková et.al., 2009).

Clusters can be oriented on a particular sector or be multi-sectoral. They may vary in e.g. size, breadth, density, state of development, innovative capacity etc. (Enright, 2003; OECD, 1999; Porter, 2008). As stated in the “White Paper”, they may be perceived as eco-systems with a particular mix of innovation activities brought about by the proximity of business, research centers, universities - so called an area clusters; or a fruit of a pro-active endeavor, initiated by authorities, or result of local initiatives with the goal of promoting innovation - so called power clusters (Europa InterCluster, 2010). Clusters within their geographical range can include a group of neighboring countries, one country, region, voivodeship, district, community or even a city (Wójcik-Augustyniak, 2009).

The cooperation within cluster brings various benefits to its actors. As companies within the cluster do business in a common field and their production is often mutually complementary together, they are able to respond faster to market changes and meet more demanding requirements of their customers. Besides, sharing marketing activities, better and faster access to labor markets and industry-specific information and new technologies gives better opportunities to the companies’ rapid development. Furthermore, mutual cooperation inside the cluster brings costs reduction and benefits from economies of scale. In addition to that, cluster as a group of companies has stronger negotiating power in sales and purchasing and greater potential to receive support from governments’ and/or other funds e.g. from European Union Funds (Porter, 2000; Feldman & Francis, 2004; Pavelková & Jirčíková, 2008; Staszewska, 2007; Staszewska, 2009).

Increasing importance of globalization in today’s World puts a new perspective on development of networking and clusters. Clusters start to be perceived in a different dimension.

Gorynia and Jankowska (2007) aptly state that high competitiveness of clusters may constitute an incentive to international expansion of clusters’ activities and where internationalization may give a chance for increasing clusters’ competitiveness. Various benefits can be noticed such as e.g. benefits of scale resulted from penetration of foreign markets or the need to increase the quality of products and/or services offered etc. The development of clusters’ international cooperation may also enable access to specialized and advanced resources, know-how, qualified work force, access to new clients and/or suppliers, to specialized services and infrastructure, to innovative branches in the industry in which cluster operates and also proximity to rivals (what e.g. influence pressure on innovations) etc.

Development of World-Class Clusters lies both on the macro (policy and programme) level as well as on the micro level (clusters themselves).

The goal of this paper is to present the development of a new concept of World-Class Clusters



in Europe with special focus on the Visegrad Group countries. This paper investigates the policy background for inter-cluster cooperation in this area. Additionally, on the basis of a research sample of clusters from the V4 countries, the problematics of cooperation among clusters, existing strategy, barriers and opportunities, as well as positive and negative aspects, are being depicted.

2 NEW CONCEPT OF WORLD-CLASS CLUSTERS IN EUROPE

2.1 The definition of World-Class Clusters (WCC)

Rapid global economic development influences new perception of clusters and competition. Following the view of researchers from IRE network, “many of the key attributes of clusters – notably their emphasis on networking and proximity based interaction – are now feasible on a global scale” and “firms are paying much less attention to location within one country or another” (IRE, n.d., p. 4). The attention from local or national clusters is being brought to clusters with a world-wide ambition and/or World-Class Clusters (high performing clusters).

According to the “White Paper” (Europa InterCluster, 2010) there are 15 criteria divided into three categories describing WCC. The following three categories and criteria among them can be distinguished:

1. Framework conditions – surrounding the cluster’s main actors:

- a) quality of cluster sector relevant R&D – the R&D capacity, openness and willingness for cooperation among R&D actors, relevance of the field of research and academic excellence;
- b) quality of the education in relevant fields – interrelations between educational institutions/knowledge suppliers and the business actors within cluster, process of policy making and educational system;
- c) dynamics of creating new and innovative companies in the region – legislation and awareness among policy makers; creation of spin-offs and strong linkages to incubators and/or test lab environments for cluster members;
- d) attractiveness of the region for high potentials and world-class researchers as well as for foreign investments;
- e) existence of innovation stimulating regulation and public sector demand – rules and regulations simplifying business start-ups and attracting private investments in R&D and innovation.

2. Cluster actors – competitiveness of main actors:

- a) critical mass of market and technology leaders developing or manufacturing high tech products, components, applications (or processes) or providing innovative services – quality of main actors;
- b) international visibility and reputation of the cluster and its actors;
- c) commitment and active involvement of key actors (industrial, academic and public) in the cluster work – strong cooperation, communication, mutual trust;
- d) involvement of competitors – rivalry as driver for competitiveness;

- e) involvement of cluster actors in international co-operations and linkages to key actors outside cluster – intensive international co-operations and connections across borders.

3. Cluster organization/management – high quality of cluster management:

- a) cluster strategy and its implementation – dedicated cluster strategy with clear guidelines for cluster members;
- b) professionalization of cluster management services;
- c) sustainability of financing and appropriate staffing of the cluster organization;
- d) coherence between educational actors, R&D institutions and cluster actors – good coherence between triple helix;
- e) added value – provide significant added value to key actors from industry and science.

2.2 Inter-cluster cooperation - the policy background

The presence of large innovation potential in cluster intersections has been noticed and the interest in cross-cluster collaboration started to rise. One of the very few initiatives in Europe providing platform for cluster collaboration was program INTERREG IIIC and its project CLOE that started in 2004. The objective of INTERREG community was to promote cross-border, trans-national and interregional cooperation.

Since the year 2006, the European Union has adopted a new innovation strategy and underlined strengthening clusters as a tool for promoting innovation and environment conducive to innovation development (Commission of the European Communities, 2006).

Launched in January 2008, the European Cluster Memorandum (further “Memorandum”) stated that “clusters reach their full potential, when there is both competition and cooperation among its participants. Clusters can leverage this potential if they create (...) solid linkages to clusters and markets located elsewhere” (Centre for Strategy and Competitiveness, 2007, p. 2).

Also in May 2008, Brussels European Council underlined again the development of broadly perceived innovation “through improved science-industry linkages and world-class innovation clusters and development of regional clusters and networks” (Council of the European Union, 2008, p. 5).

In November 2008, the European Commission introduced a communicate called “Towards world-class clusters in the European Union: Implementing the broad-based innovation strategy” stating that enabling trans-national cooperation between clusters needs to be further strengthened since strengthening cluster excellence through trans-national cluster cooperation at business level contributes to creation of European research and innovation space (Commission of the European Communities, 2008).

This brought a response in the Visegrad Group - countries of the Central European region: Poland, Czech Republic, Slovakia and Hungary, which in full harmony with Memorandum and European Commission Communicate have reached in November 2009 a “Memorandum of Understanding” (further “V4 Memorandum”) committing to support cooperation between clusters at national and international levels. In V4 Memorandum, the parties commit to collaborate in development of clusters and to encourage cross-border cooperation between clusters, to support cooperation both within the member states of European Union and third countries.



Since that time, promoting trans-national cooperation and development of WCC in Europe became more and more popular. The actions to remove barriers to trans-national cluster cooperation, and to encourage the emergence and consolidation of world-class competitive clusters across Europe were undertaken (European Commission, n.d.). The idea of development of cross-clusters cooperation linkages started to expand rapidly and take various forms such as: networks for collaboration, platforms for cooperation, clubs, alliances, trans-national cooperation, groups of collaboration, bilateral agreements, partnerships, projects of collaboration etc. Among them for example the following can be distinguished:

- EACP - European Aerospace Cluster Partnership - network of more than 30 aerospace clusters across Europe that aims at strengthening the position of the European aerospace industry in the world markets through clusters (<http://www.eacp-aero.eu/>);
- CLUSTERPLAST - inter-cluster initiative to target the future challenges for the European polymer converting industry, to promote synergies between the local/regional authorities, business entities and research organisations from the 6 European regions (<http://www.clusterplast.eu/>);
- Cluster-IP - The Cluster Innovation Platform - bringing together cluster organisations from different countries willing to cooperate in working on the modernisation of cluster support services in the EU; within it two other cluster partnerships: “EcoCluP” in eco-innovative industries and “ABCEurope” in the biotechnology sector (Europe INNOVA, n.d.);
- Clusters Cord project (Clusters and Cooperation for Regional Development in Central Europe) - focusing on promotion of the exchange of best practices in cluster management and cooperation among clusters from the same thematic field but different geographical origin, through the creation of so called “meta-clusters” (<http://www.clusterscord.eu/>);
- Food Innovation Network Europe (FINE) – network of food clusters from 8 European regions combining their efforts to make the European food sector more competitive through innovation and cooperation (<http://zakonczone.ppnt.poznan.pl/networkfine/index2.htm>).

Further, in March 2010, the European Commission introduced a proposal for a new strategy “Europe 2020: A strategy for smart, sustainable and inclusive growth” including promotion of clusters within one of its seven Flagship initiatives titled “An industrial policy for the globalisation era”.

In general, the European Commission facilitates (European Commission, n.d.):

- networking between cluster policies within PRO INNO Europe initiatives which aim to promote trans-national policy cooperation in the area of innovations;
- networking between regional authorities, enterprises and research entities at European level through Regions of Knowledge (RoK) initiative pursuing trans-national networking of regional research-driven clusters;
- interregional cooperation through Regions for Economic Change initiative keeping focus on the need for innovation;
- networking between clusters at operational level under the Europe INNOVA initiative which is helping clusters to cooperate with other clusters across Europe to exchange ex-

perience, explore opportunities for strategic cooperation between them and develop joint strategic partnerships to join forces, streamline business activities, minimise costs and become more competitive in the global market;

- better understanding and diffusion of information about cluster programmes and about priority-setting in Member States – under PRO INNO Europe and ERAWATCH initiatives;
- exploring synergies with the European Technology Platforms (ETPs) as important instruments stimulating transnational cooperation between regional clusters and better integrating the science base with industrial R&D activities across the EU.

Even though, the cooperation among clusters from different regions and across national borders recently became a vital subject of European policy towards clusters, the support within existing cluster policies appears as unsystematic and difficult to implement in practise. As within 27 member states exist 27 different approaches towards cluster-based policy plus further policies implemented on regional and/or local levels, that gives numerous amount of solutions put into action. Different programs aimed at clusters, various financial tools, rules for implementation, time frames for processing applications etc. all that is almost impossible to coordinate for clusters who wish to cooperate. Therefore, clusters have to be aware of this fragmentation and its hampering influence on emergence and development of alliances and cooperation between European clusters aiming to achieve a world-class status (Europa Inter-Cluster, 2010).

3 ANALYSIS OF RESEARCH SAMPLE FROM VISEGRAD GROUP COUNTRIES' CLUSTERS

3.1 Methods of investigation and characteristic of the research sample

Within this research the sample of 84 clusters from Poland, Czech Republic, Slovak Republic and Hungary was tested. As a first step of research, mapping of current status of cluster development in individual countries was conducted, during which clusters showing activity were selected. The questionnaire was directed to 80 Polish, 40 Czech, 15 Slovak and 18 Hungarian (accredited within the Pole Program) clusters, in total to 153 clusters, 55% of return was observed. Two methods of investigation were used: questionnaire and structured interviews. Questionnaire was directed to the cluster management (steering group) in order to obtain the information regarding the inter-cluster cooperation.

The investigation proceeded from the third quarter of 2010 till first quarter of 2011. Figure 1 presents the division of clusters from particular V4 countries which took part in the conducted research. Clusters in the sample characterize young age of existence as 75% of analyzed clusters were established in the year 2007 or after (3-4 years old).

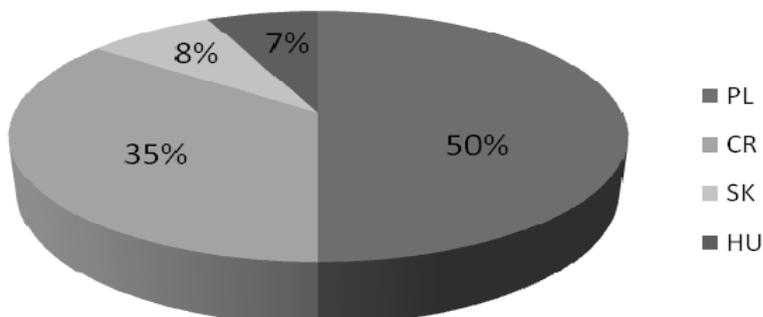


Fig. 1 – The division of clusters in the sample from Poland, Czech Republic, Slovak Republic and Hungary.

Source: own research

3.2 Research results

One of the fundamental parts of every cluster organization is their strategy and clear guidelines for cluster members. The steering group of clusters within the research sample was asked which strategies are dominant for inter-cluster cooperation (Fig. 2). The most indicated answers were establishing contact to other networks and clusters and embedding into co-operation projects with members of other networks and clusters - 70% and 61% respectively. That shows a high interest of clusters in development of their cooperation linkages with other clusters and their awareness of the need for collaboration on a higher level in order to further develop and maintain their competitive advantage above others in the globalized market. The starting point of inter-cluster cooperation is the implementation of common projects with members of other networks and clusters. Also, as important strategies are considered the establishing of contacts to other networks and clusters by joining (technology) platforms and contacts to business development agencies (in regards to both, one-third of clusters considered it as vital).

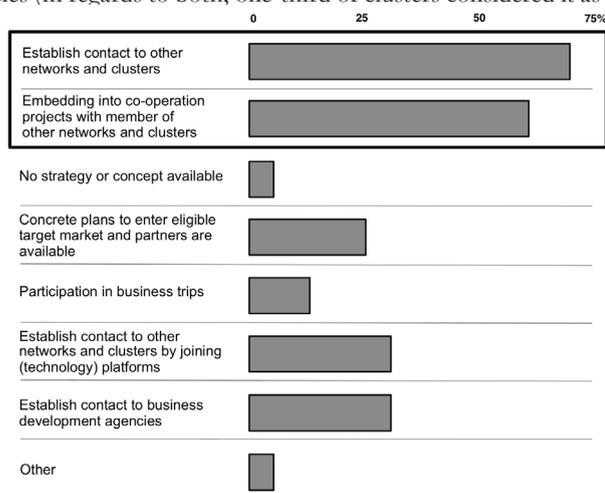


Fig. 2 – Dominant strategies for inter-cluster cooperation (in the sample). Source: own research

68% of clusters within the sample declared to cooperate with at least one other cluster (inter-cluster cooperation). However, the number of clusters with which one cluster acknowledges the collaboration with others varies from 1 up to 33 clusters (where we deal with platforms of collaboration such as e.g. EACP). Within this group, 67% of clusters acknowledge the informal character of their collaboration with other clusters and 56% declare the formal character e.g. within platform, agreement of collaboration etc. (15% of all clusters in the sample join both types of cooperation). The most popular area of informal cooperation takes place in exchange of information and experience in the cluster management, in the line of obtaining financial support and specific for the particular industry (Fig. 3). Right behind them, there is networking and consultancy in project preparation. Within the formal character of inter-cluster cooperation organization of seminars and conferences, and consultancy in projects preparation as well as common projects implementation (e.g. European Union projects) is distinguished as the leading areas. Surprisingly a relatively low percentage of clusters cooperate on common research and development. Collaboration in the organization of common events with promotion character, products/services offer and benchmarking appears as the least interesting spheres for cluster-to-cluster cooperation.

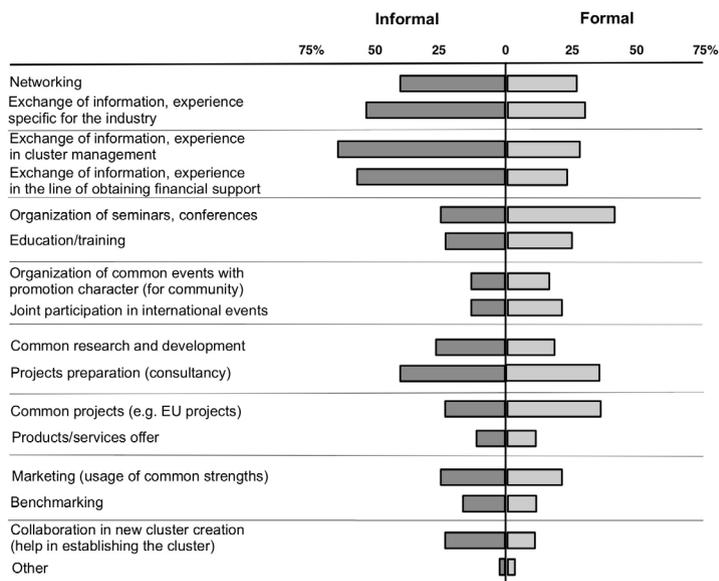


Fig. 3 – Spheres/areas of inter-cluster cooperation with division to formal and informal character (in the sample).

Source: own research

A majority of clusters within the sample collaborate either with other clusters from different regions but within the same country - 53% or within the same region (voivodeship) - 47%. Cooperation on the international level characterizes 39% of researched clusters while cross-border cooperation is the least common among clusters - 28%. The person responsible for leading the inter-cluster activities within the cluster is usually a cluster manager (91%) who often has support of top management of the companies in the cluster (management board)

(26%), and sometimes also support of member companies and/or representatives of a university or research institution (a cluster member) (11%).

Clusters cooperate with one another with different aims (Figure 4). The leading goal of this collaboration is to extend cluster's reputation, promote itself. Furthermore, analyzed clusters are interested in exchange of information and experience at international level (world's best technology, know-how etc.) and finally obtain access to know-how, technologies which are not available within their own network (technology development). They also acknowledge improvement of competitiveness as a significant reason for inter-cluster cooperation.

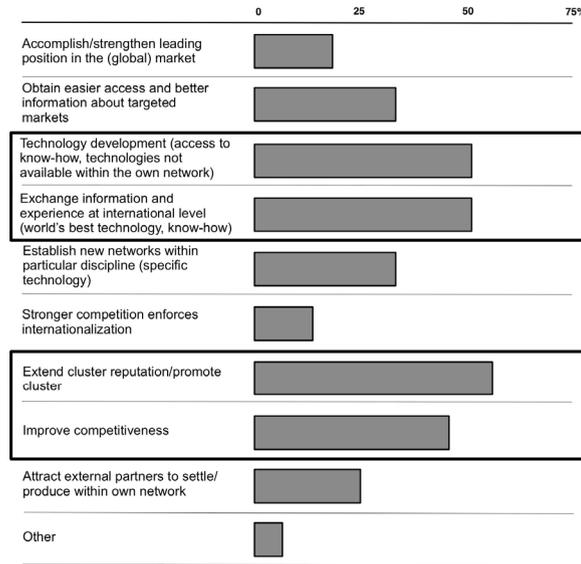


Fig. 4 – The reasons for inter-cluster cooperation (in the sample). Source: own research

However, not all clusters are prepared to undertake inter-cluster activities and start collaboration with other clusters. 32% of clusters in the sample declare that they do not cooperate with other clusters due to certain reasons. As main barriers they distinguish the following:

1. cluster is not prepared for inter-cluster competition (weak internal structure, too young age);
2. financial barrier (e.g. lack of funds, unsupported financing of common projects, problems with co-financing etc.);
3. and lack of contacts/opportunity to start collaboration.

Clusters in order to start cooperation with external partners first have to have strong internal structure based on trust and good communication linkages among their members. Also the financial barrier constitutes as a factor hampering cluster-to-cluster cooperation development which is a result of unsystematic and unsynchronized support within various programs lead within cluster-based policies in different countries. Problems with co-financing appear when financial sources for e.g. cross-border cooperation projects are limited to support only clusters

within the country providing support and where each partner in cross-border cooperation has to finance its own activities. Clusters, especially young ones which have limited funds for their organization and activities and which are not known yet in their surrounding, often suffer from lack of contacts and opportunities to start collaboration. As further limitations appear, conflict of interest (as potential partners are competitors) and inseparably connected with that lack of mutual trust between partners (distance and fear from unknown).

Even though, not all clusters are mature enough to widen the cooperation outside their border, companies collaborating within clusters' structures feel the need to do that and are often interested in inter-cluster cooperation (in the future). In 77% of analyzed clusters, the steering board acknowledged the interest of companies to extend the clusters' and member companies' own activities within cluster-to-cluster collaboration. As a major advantage, the exchange of information and experience is being perceived. In this form of extended cooperation, companies within the cluster see an opportunity to gain more information specific for their industry, learn from the experience and good practises (implemented on the international level), and take advantage from knowledge transfer (obtain know-how). A further interest is a co-promotion of companies for example in the form of joint stands in international trade fairs and implementation of common joint projects and ventures which stimulate further development and internationalization of companies. Another positive aspect constitutes "business matching" which brings the advantage of mutual purchases, development of business relations in regards to export/import of products, commercial contracts, networks of suppliers and distributors for companies' products etc. Additionally, companies search for support in learning, developing and promoting new technologies (innovation and technological development). They are open for common research and development and marketing activities. Creation of partnerships and cooperation linkages with companies from other clusters means for them building contacts with potential buyers of their products, acquiring new markets, obtaining possibility for joint acquisition of funding for trans-regional projects, further ways of obtaining funds for their development etc. It also opens the possibility to jointly organize and participate in trainings, exhibitions, education events, conferences, seminars stimulating knowledge transfer and learning process among companies.

Positive (opportunities) and negative (threats) aspects of inter-cluster collaboration

Inter-cluster collaboration brings along both positive as well as negative aspects which either constitute as an opportunity for further development or hamper clusters' activity and growth. The positive features distinguished by the sample group of clusters are presented in Table 1.



Tab. 1 – Positive aspects of inter-cluster cooperation (in the sample) according to their importance. Source: own research

Positive aspects of inter-cluster cooperation
1. Exchange of information (knowledge transfer), experience, and good practices e.g. about the way clusters function (also in other countries), how they are managed, about new technologies, about existing cluster policies in different countries, learning from others.
2. Broadening the base of contacts, partners, networks of cooperation, exchange of customers' list etc.
3. Co-promotion (promotion on the international level) - through inter-cluster collaboration clusters obtain new promotion possibilities; joint stands on international trade fairs etc. Cooperation on common (international) projects e.g. 7FP, INTERREG etc.
4. Obtaining new customers and entering new markets – what brings new experience and perspective for development of companies – cluster's members.
5. Bigger strength in lobbying - easier to influence the cluster-based policy in the state (responsible Ministries), in the EU.
6. Mutual purchases, common business, trade cooperation. Improve of cluster's competitiveness, increasing its position as a partner in the eyes of the business surrounding.
7. Synergy of clusters' resources, accumulation of clusters' potential. Acquisition and deployment of innovative technologies, technological development, common R&D. Joint development (faster and more effective).
8. Joint marketing activities. Joint preparation of pilot projects. Economic effects: increase of turnover, revenue; decrease of expenses on research, decrease of costs on organization, projects preparation etc.; positive effects of economies of scale e.g. dividing the orders.

Additionally, clusters also underline as positive aspect the possibility to exchange the information regarding the cluster-based policies in different countries and forwarding obtained knowledge to local authorities and to other clusters. Exchanging the experience with usage of financial sources (subsidies) is considered beneficial as well.

Inter-cluster collaboration may also bring along negative influence on clusters development (Table 2).

Tab. 2 – Negative aspects of inter-cluster cooperation (in the sample) according to their importance. Source: own research

Negative aspects of inter-cluster cooperation	
1.	<p>Distrust among the members of cooperating clusters, towards new partners, mental barriers, mistrust, lack of adequate openness, lack of conviction that everyone can benefit and that competitiveness stimulates development.</p> <p>Some degree of competition for obtaining (financial) resources for development (e.g. decrease in local funding sources), competition in the market.</p>
2.	<p>Reluctance of entrepreneurs to participate in activities within inter-cluster collaboration, too small commitment, fear of unknown.</p> <p>A strong rivalry between the clusters - (fear of) competition between the two sides.</p>
3.	<p>Lack of sufficient and available financial resources, high costs of foreign travels, study visits etc. and therefore difficult communication.</p>
4.	<p>Lack of time.</p> <p>Fear of knowledge transfer, new technologies, safeguarding the know-how, lack of clear rules regarding the transfer of know-how etc.</p> <p>Fear of copying the ideas, fear for intellectual property theft e.g. patents etc.</p> <p>Overrated personal contacts - not knowing the right people from other clusters, difficulty in finding good partners.</p>
5.	<p>Misunderstanding of the clustering idea - decrease of the meaning of good cluster initiatives.</p> <p>Fear of losing the market position – risks of the acquisition of the local market by companies from outside.</p> <p>Divergence of clusters' objectives - potential conflict of interest (e.g. everyone wants to promote their own products).</p> <p>Problems in communication - language barrier.</p> <p>Differences on legislation level (clusters functions differently in various countries), in culture and clusters.</p>

In addition to that, clusters see unnatural elongation in decision-making processes (within a group of cooperating clusters), possibility of migration of cluster's partners to other cluster organizations, lack of existing strategy which would support the initiation of cluster-to-cluster cooperation (lack of concrete steps on a governmental level) or even economy espionage as further difficulties hampering inter-cluster collaboration.

4 CONCLUSION

Clusters are considered an effective tool facilitating and stimulating entrepreneurship progress, stimulating and maintaining competitiveness, and a tool for competitive strategy. They became an approach to foster innovation, co-operation and internationalization among companies and regions to succeed in global competition.

Nowadays, the internationalization factor plays more and more crucial role in clusters' development. Clusters are no longer perceived as isolated organizations but as eco-systems with ambitions to become World-Class Clusters, internationally visible and with intensive involvement

of their actors in international co-operations and linkages across borders. The development of various forms of inter-cluster cooperation such as trans-national, cross-border and/or inter-regional cooperation among clusters and companies collaborating within their structures has been popularized in policy documents in Europe in recent years including Visegrad countries. Also various types of cooperation linkages have been established among clusters such as platforms or projects of collaboration, alliances and clubs etc.

Even though, the concept is still young in its existence in V4 counties, the growing interest in its development is being reflected in the analyzed group of clusters. Clusters in the sample are aware of the need for international expansion of their activities and internationalization as a chance for further development and increase of their competitiveness. Various benefits of inter-cluster cooperation are being noticed where among others access to specialized knowledge, advanced resources, know-how, new markets and customers, sharing experience and learning from good practices of others are considered as primary advantages. Clusters are also conscious about barriers and negative aspects which this type of collaboration brings along. This in turn, helps them to pay closer attention towards existing or potential threats and imperfections in order to avoid them in the future.

The analyzed sample of clusters in principle of the research conducted does not show significant disparities in regards to their national belonging and inter-cluster cooperation character. From this research 34,5% of respondents declare cross-border and/or international cooperation. These clusters exhibit attributes of World-Class Clusters. However due to their relative young age, more research is warranted in order to expand on this concept. It is believed that with maturity these clusters will portray a greater resemblance to World-Class Clusters.

Even though, the cooperation among clusters from different regions and across national borders in Europe (including V4 countries) became recently a very popular subject among policy makers and clusters themselves, there is still a lot to improve on both levels in order to enable clusters drive towards inter-cluster collaboration development and becoming World-Class Clusters.

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Contact information

Mgr. Magdalena Bialic-Davendra

Tomas Bata University in Zlín, Faculty of Management and Economics

Mostní 5139, 76001 Zlín, Czech Republic

E-mail: bialic@fame.utb.cz

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