NETWORK LIFE CYCLE AND ANCHORING PROCESSES

Patrycja KLIMAS

Summary: Anchoring processes are quite a new research field in strategic management. Until now anchor tenants, anchor firms and anchor organizations used to attract attention mainly of developers and economic geographers. This paper sheds some new light on anchor hypothesis from strategic management and interorganizational network perspectives. The main objective of this paper is a presentation of one part of a research on anchor organizations conducted under European research project named FRIDA. The paper includes short introduction into the theory of anchoring processes and anchor organizations, a concise description of research project and a presentation of research results referring to the anchoring processes realized within Aviation Valley in Poland.

Keywords: networks, anchor firm, anchoring processes, cluster, aviation.

1. The anchor organization and anchoring process

The concept of anchor first appeared in the field of department stores and later it was transferred to the area of economic geography and management. From that point onward the concept of an anchor has been extended into a new area, where its role and significance has changed (fig. 1).

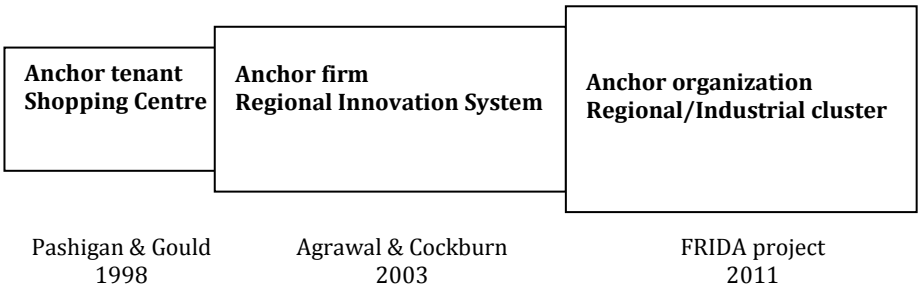


Fig. 1. The extension of the anchor hypothesis

The term of anchor was implemented to the literature by Pashigan and Gould in 1998 [1]. At the beginning it was an anchor store (anchor tenant) which had a positive impact on the whole shopping mall and through attracting customers influenced particular stores located there. The significant role of the anchor store is based on its size and reputation among clients. It has more mass appeal to clients so every shopping mall should have at least one anchor tenant. Later research [2] showed that the benefits of less-known sellers depend on two factors. First, benefits are greater if anchor store sells standard, riskless and

low value products (the more attractive the anchor's commodity is, the lower the benefit to others is). Second, the number of normal retailers can not be too large.

Anchor store has become an archer for anchor firm concept. Agrawal and Cockburn [3] have increased the range of meaning of anchor and moved it outside the shopping mall. In their opinion anchor firm plays significant (pre-development) role in the whole Regional Innovation System. The anchor firm category in the area of Regional Innovation Systems reflects the features and functions of anchor tenant in the field of shopping malls. Anchor firm is a large but at the same time local company strongly involved in R&D processes, which has a specific absorptive capacity. The significance of anchor firm results from: creating and capturing externalities within local innovation system, stimulating spreading of innovation and new technologies in the region, being a channel for spillovers, increasing the absorptive capacity, increasing access of SMEs to the innovation, and commercializing inventions of regional universities. In general anchor firm is a management and monitoring centre of innovation in the region [4].

Further studies have adapted the idea of anchor firm to the cluster concept. Wolfe and Gertler [5] have indicated that existence of anchor firm in a particular region is important for cluster formation and its development. The anchor presence is the most significant in the initial stage of cluster life cycle, when some future cluster members spin off from the anchor firm. Anchor firm has ability to attract new cluster members engaged in a specific or related activity. Moreover, it facilitates knowledge generation and its flow within the cluster and contributes to growth of related companies (other cluster members).

It should be noted that in the Polish literature in the area of management, the term of anchor is also used in completely meaning. For instance Gancarczyk [6] writes about specific type of industrial district named *anchor district*. That type of network is coordinated by at least one public institution which acts as a district leader. An impact of anchor district on regional development is unstable, unpredictable, and furthermore it depends on innovation and investment decisions made outside the district [6]. It is completely opposite to the anchor firm concept described i.e. by Agrawal and Cockburn, in which anchor is the motive force of industrial or regional development as well as its own. The concept of anchor district is related to the classification of industrial districts presented by Markusen [compare 6 and 14] .

In conclusion it can be said that anchor is large [1, 3] and reputable with strong brand [1, 2], it attracts newcomers [1,2, 5, 7], promotes and accelerates R&D processes [3, 4], absorbs external and state of the art knowledge and technology [3], leads to spillover effect [7] and triggers spin-offs [5]. Furthermore, the anchor should be perceived as a leading entity (in economy, industry, etc.) which has an ability to drive the regional development through orchestration processes, creation of global production networks, maintaining the flow of knowledge, competencies and people among countries and nations [8]. Anchor also accelerates value creation processes mainly through creation, diffusion and absorption of knowledge [9].

1.1. The fresh view on anchors

Anchor organizations and anchoring processes seem to be particularly relevant in the era of Knowledge Based Economy [10]. Their importance is based on large scale of operation, intensive R&D processes, well-developed skills of knowledge absorption and innovation commercialization, influence on other organizations through stable and central network position [9, 11]. Quite often it is emphasized [7, 12] that anchor does not have to

be a company. Anchoring processes may be realized, for instance, by universities, training organizations, research institutes, public authorities, etc. A broad view on anchors and their significance is a foundation of an anchor hypothesis [7].

The anchor hypothesis states that some organizations among network participants play specific roles in value creation processes within the whole network and in particular region. It is significant especially in making locational decisions by organizations, building suppliers networks (supply chains), allocation of public funds for R&D activity, development of companies, industry, region and economy [8; 9]. In the area where some organizations anchor their activity is created an anchoring milieu [12]. The anchoring milieu is a group of local organizations collaborating in order to create or develop more advanced knowledge in a particular field. Their interaction is based on competition or/and cooperation rules. Organizations which co-create anchoring milieu interact both locally (among themselves) and regionally/globally (with distant and/or mobile partners). The anchoring milieu can be a formal network organized for instance as an association, cluster or consortium. The main result of presence of the anchor organizations in a particular region is creating its capacities to anchor knowledge which is much more mobile than before. In other words the anchoring milieu reflects "*the capacity within a region to mobilize mobile knowledge from elsewhere*" [12, s.4].

Besides increasing popularity of anchoring processes, there are still research and cognitive gaps, especially in the strategic management perspective. Due to the insufficient knowledge a group of researchers have decided to conduct research to fill in the existing gaps. The research project was run under the name FRIDA (Fostering Regional Innovation and Development through Anchors and Networks) in the years 2009-2011, and has received support from the 7th Framework Programme (Socio-Economic and Humanities Sciences, contract number 225546). Project's realization included seven independent research teams, six countries and three business sectors: nanotechnology (France, Italy), biotechnology (Germany, UK, Italy) and aviation (Poland, Ukraine). The FRIDA's aim was to understand the reasons of their qualitatively different impact of anchoring processes on different regions, and how and why they assist the development of networks and capabilities in regions. More information about the project, its objectives and results is available at FRIDA's website: *www.fridaproject.eu*.

2. Aviation anchors in south-eastern Poland

Among the objectives of FRIDA's project there was the understanding how and why anchors assist the development of networks and capabilities in regions. On the Polish ground we adopted a case study approach to recognize main distinguishing features of anchor organizations, their roles and functions inside the network and their influence on regional development. The research was conducted applying questionnaire based on 7-point Likert scale. It was divided into five separate parts related to effectiveness, innovativeness, anchoring processes, strategic potential and geographical proximity (you can find a description of research methodology and its justification in 13). To supplement information and obtain more detailed data the research team conducted several in-depth interviews.

Research on anchoring processes was based on Aviation Valley which is the biggest (currently 85 members) and the oldest (established in 2003) aviation cluster in Poland. Aviation Valley covers around 90% of Polish aviation industry [according to the PARP]. The choice of aviation industry was justified by several reasons [11]: high level of R&D activity, high level of networking, high probability of identifying anchor organizations and

maturity of aviation sector. Moreover, every sector which has been chosen for investigation under FRIDA was analysed by two separate research teams, in (at least) two different European regions. The aviation sector was also investigated by the Ukrainian team. It allowed us to make industrial-level comparison and draw additional conclusions.

2.1. Anchors' identification

The first phase of field research contained identification of potential anchors in the Aviation Valley. A literature review provided a list of features of organizations which realize anchoring processes. In general authors are in agreement that anchor organizations are simultaneously large, reputable, R&D oriented and focused on acquiring knowledge and that they occupy central network position. The above criteria were used as preliminary conditions for identification of potential anchors [11]. In general three anchor organizations were identified – WSK PZL Rzeszów, PZL Świdnik and Avio Polska. The anchor's selection process was based on:

- Size (level of employment);
- Strategic orientation (R&D expenditures, quantity and value of realized research projects, innovativeness);
- Level of centrality (measured separately with level of degree centrality, betweenness centrality and closeness centrality);
- Authority and power (decision-making capacity at the cluster and industry level);
- Significance and industrial reputation (opinions among the other members, references provided by PARP and research institutions).

2.2. Anchors' roles and functions

Identification of anchors has allowed focusing on their specific roles, functions, objectives and influence on network's activity. In general, Aviation Valley seems to be an industrial district named Hub-and-Spoke District [14] with three independent anchors.

Aviation Valley is an industrial association with formal structure which is dominated by several large companies surrounded by their suppliers, subsuppliers and subcontractors. Among the most important actors there are WSK PZL Rzeszów, PZL, PZL Świdnik and Avio Polska. They are the biggest and the most influential companies which decide about the future of Polish aviation industry. Therefore, we can identify within the cluster three "unofficial" and "informal" sub-clusters [11] (fig. 2):

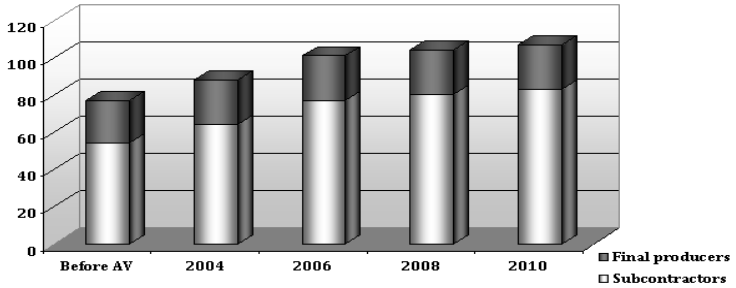
- First one near Rzeszów with WSK PZL Rzeszów in the centre;
- Second one near Świdnik with PZL Świdnik in the centre;
- Third one near Bielsko-Biała with Avio Polska in the centre; it is worth noting that Avio Polska has established new aviation cluster "Silesian Aviation Cluster. Federacja Firm Lotniczych Bielsko", almost all of its members participate in Aviation Valley.

Fig. 2. Three anchoring milieu inside the Aviation Valley

The Avio case points out that particular organization can play a role of anchor in more than one network at the same time (even in competitive networks). However, the anchoring processes implemented in parallel by one organization may be carried out in totally different ways. The differentiation refers to intensity, scope and frequency of anchor's actions. Received results indicate that the dynamic of anchoring processes depends on/is dedicated to the particular network and its environment (similar results were obtained by Italian research team – a case of STMicroelectronics).

It should be noticed that within the cluster there is low degree of cooperation in the field of risk sharing, market development or innovation processes among anchors. Although they do not compete at the cluster level but at the global level - all of them are owned by direct, global competitors UTC, Augusta Westland or Avio Group. Therefore, lack of tight cooperation and formation of sub-clusters should not be surprising.

The core firms of the cluster are embedded globally and have substantial connections with organizations outside the network. In general, all the most important firms are subsidiaries of global corporations like United Technology Corporation (especially: WSK PZL Rzeszów, PZL Mielec, Hamilton Sunstrand Polska), Augusta Westland (PZL Świdnik) and Avio Group (Avio Polska). The financial and technological support from global corporations allows attracting newcomers to the aviation industry. 34 % of Aviation Valley members were established after the formation of the cluster. Among attracted organizations are mainly national subcontractors (fig. 3), but also Foreign Direct Investments (both greenfield and brownfield).



* At present Aviation Valley consists of 85 organizations, some of them are both subcontractors and final producers therefore, above values do not add up to 85.

Fig. 3. Increase of members of Aviation Valley

Among the most important foreign investors attracted to Polish aviation industry should be listed: MTU Aero Engines (Germany), King & Fowler (UK), BorgWarner (USA), Norbert Industries (USA) and Hamilton Sundstrand (USA). Their long term investments exceeded 1 billion zloty, and have created more than 1,000 new workplaces.

Capital ties are related to another attribute typical for Hub-and-Spoke District – most key investment decisions are made locally, but they are spread out globally. The activity of the core companies is consistent with corporate strategy but at the same time it fits the local capabilities and national circumstances. Most of large Aviation Valley's members are subsidiaries which in parallel conduct activities in the Polish aviation industry and act as subcontractors/suppliers for their parent companies. It should also be highlighted that the decision-making ability within the cluster is theoretically wielded by the board of Aviation Valley. In fact the cluster's president, who is also the president of one of the anchors – WSK PZL Rzeszów – is the only decision-maker [see more details in 11]. Therefore, there is a possibility that whole Aviation Valley activity will be subordinated to the objectives of WSK PZL Rzeszów. Moreover, in long term such situation may lead to the lock-in effect. "*When anchor tenant firms are organizing the cluster to its own benefit, it may reduce diversity, enhancing convergence around its own knowledge base* [15].

Anchor organizations take care of creation and maintaining of knowledge bases inside the network and pay great attention to building future staff. Anchoring processes contain activities and operations aimed at creating well-skilled labor poll. Anchors try to influence educational system through projects oriented on adjustment of educational programmes and skills/competencies of future workers to the needs of entrepreneurs (including such projects like "Gimnazjum" or "CEKSO – Training Centre for Operators"). Moreover, the largest and the most influential Aviation Valley's companies have taken the patronage on several technical education units investing in long-term and trust based relationships with potential, future employees. Anchor organizations are aware that due to their authority, reputation and specific network position they have a selection priority of workers (e.g. from graduates). The most influential companies have a choice of potential employees from a wide and deep labor pool.

During research it has been noticed that the activity and functions of anchors change over time together with cluster's development. Anchor organization plays different roles in emergence, growth, maturity and decline phases of cluster life cycle (fig. 4).

In the first, emergence phase anchor organizations focus on network preparation and its establishment. Core anchoring processes are related to:

- preparation of cluster establishment (searching potential partners, organizing financial support, choosing collaboration form etc.);
- setting objectives, vision and cooperation rules.

When network is growing (second phase) anchor organizations focus especially on:

- attracting new, mainly local members (newcomers do not have to meet any special requirements);
- reinforcing internal communication and mutual relationships (including meetings and conferences, presentations of offers, implementation of joint research projects);
- stimulating internal cooperation and trust building (including shared databases, joint projects, reciprocal benchmarking visits etc.);
- organizing financial support ;
- network's promotion.

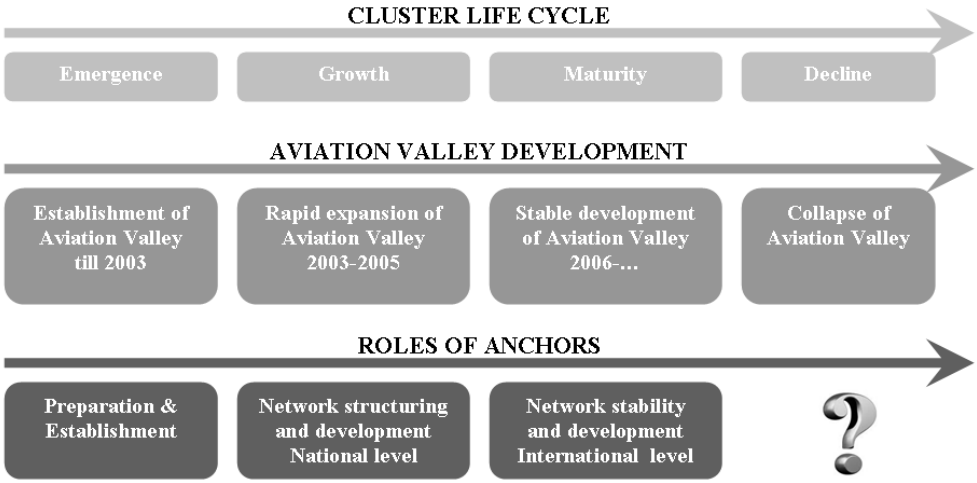


Fig. 4. Changes in core anchors' activity

The main difference between second (growth) and third (maturity) phases from the anchoring processes point of view is the level of action. The orientation of action is moving from national to international level. During the maturity phase anchoring processes aim at:

- reinforcing external and internal communication;
- mobilizing external and internal cooperation;
- european and global promotion of cluster;
- creation skilled labor pool;
- attracting new, members and their selection (applying selection mechanisms).

Moreover, in the third phase anchor organizations seem to pay greater attention to "quality" of newcomers (stricter selection criteria) and to the scientific and innovative potential of realized projects.

Anchor organizations should take it into consideration that mature networks are usually threatened by a lock-in effect [15]. Furthermore, in mature networks where more than one anchor organization operates only one of them is able to play the role of network orchestrator. This means that in particular network more than one anchor and only one orchestrator might exist. Therefore, acting as the network orchestrator should not be perceived as a constitutive feature of anchor organization. Our case (as well as Italian cases) has shown that anchors compete to play the role of the orchestrator. In Aviation Valley the number of anchors as well as the content of anchoring processes has changed over time. At the beginning, in the emergence phase there was only one anchor (WSK PZL Rzeszów), but later during the growth phase the further anchors (Avio Polska and PZL Świdnik) have appeared. It is consistent with results obtained by Italian research team. Those anchor organizations which activate with a delay are called *sleeping anchors* [15].

Finally, a decline phase. A considered case of Aviation Valley is in maturity phase therefore, any anchoring processes realized during decline phase could not be identified. In general, obtained results indicate that anchoring processes are closer rather to the emerging strategies than to the conscious strategy [11]. The structure and trajectory of anchoring processes are probably conditioned by network's structure, size, scope or phase of development or/and type of industry.

3. Conclusions

Anchor organizations are peculiar type of network members characterized by distinguishing set of features and attributes like size, authority, tight focus on knowledge creation and its commercialization. They play important role in network development during its whole life cycle which is reflected in regional development. It is clear that these key network members use the anchoring roles for their own purposes, especially to increase network performance for being able to appropriate higher value.

To conclude, anchor organizations exert positive influence on network and regional development, especially by: (1) providing successful business model, (2) acceleration of network innovativeness by effective network orchestration (but only one anchor may play the role of network orchestrator), (3) attracting appropriate subsuppliers and subcontractors, (4) triggering cluster and cluster initiatives (including stimulation of bottom-up initiatives), (5) providing external funding for R&D projects, (6) ensuring an adequate level of network heterogeneity (preventing from lock-in effect), (7) generalization of knowledge spillover effect, (8) supporting partners (their capacities and capabilities), (9) taking care of business incubators and (10) being a source of spin-offs [see also FRIDA project's results in 8 or on its website]. Our findings indicate that the roles played by anchors in network are changing over time. Anchor organizations pay the greatest attention to (1) preparation and establishment of network in emergence phase, (2) to network structuring and development at national level during growth phase and (3) network stability and development at international level in maturity phase of network life cycle. The above findings are complement to the results obtained by Wolfe and Gertler [compare with 5].

Anchoring processes have significant meaning for interorganizational networks and for regional economy. However, further research is needed to improve our understanding of the trajectories of anchoring processes implementation. Future projects should especially focus on anchoring processes in different than high-tech sectors, relationships among anchors within particular network and roles of anchors played during decline phase of networks.

References

1. Pashigian B.P., Gould E.D.: Internalizing extarnilities: the pricing of space in shopping malls. Journal of Law & Economics, Apr98, Vol. 41, Issue 1, 1998, 115-142.
2. Konishi H., Sandfort M.T.: Anchor stores. Journal of Urban Economics, Vol. 53, 2003, 413–435.
3. Agrawal A., Cockburn I.: The anchor tenant hypothesis: exploring the role of large, local, R&D-intensive firms in regional innovation systems. International Journal of Industrial Organization, Vol. 21, 2003, 1227–1253.
4. Niosi J., Zhegu M.: Aerospace Clusters: Local or Global Knowledge Spillovers? Industry and Innovation, Mar 2005, vol. 12, 2005, 22-29.
5. Wolfe D. A., Gertler M. S.: Clusters from the Inside and Out: Local Dynamics and Global Linkages. Urban Studies May 2004, Vol. 41, No.5/6, 2004, 1071–1093
6. Gancarczyk J.: Wpływ klastrów na aktywizację gospodarczą regionów turystycznych. „Oeconomia" 9, 4, 2010, 101-109. (in Polish)
7. Feldman M.: The locational dynamics of the US biotechnology industry: knowledge externalities and the anchor hypothesis. Industry and Innovation, 10, 3, 2003, 311–328.

8. Lorenzoni G.: The Life Beyond Anchoring: a Genealogical Approach. Available at: http://www.fridaproject.eu/docup/The%20life%20beyond%20Anchoring_Lorenzoni.pdf [access: 23.10.2011r.].
9. Czakon W.: Hipoteza kotwiczenia firm. W: Zarządzanie. Informatyka. Dylematy i kierunki rozwoju. Red.: A. Bajdak, M. Nowak, A. Samborski, H. Zawadzki. Wydawnictwo UE Katowice, Katowice, 2010, 13-26. (in Polish)
10. Klimas P., Czakon W.: Sieci oraz firmy kotwice – ich znaczenie w gospodarce opartej na wiedzy. W: Zarządzanie. Informatyka. Dylematy i kierunki rozwoju. Red.: A. Bajdak, M. Nowak, A. Samborski, H. Zawadzki. Wydawnictwo UE Katowice, Katowice, 2010, 109-124. (in Polish)
11. Czakon W., Klimas P.: Anchoring and the Orchestration Processes: the Case of Aviation Valley. W: Fundamentals of Management in Modern Small and Medium-Sized Enterprises. Red. S. Lachiewicz, A. Zakrzewska-Bielawska. Technical University of Lodz Press, Łódź, 2011, 304-321
12. Crevoisier O.: La circulation du capital. Territorial knowledge dynamics and anchoring milieus in Europe. Universite de Neuchatel Working Paper No. 8-2011/E. Available at: http://www2.unine.ch/files/content/sites/maps/files/shared/documents/wp/WPMAPS_8_2011_dynam_Cre_en.pdf [access: 21.12.2011r.]
13. Dyduch W.: Metodyka badań zjawiska kotwiczenia wśród organizacji współpracujących w sieci powiązań. W: Zarządzanie. Informatyka. Dylematy i kierunki rozwoju. Red.: A. Bajdak, M. Nowak, A. Samborski, H. Zawadzki. Wydawnictwo UE Katowice, Katowice, 2010, 49-70. (in Polish)
14. Markusen A.: Sticky places in slippery space: A typology of industrial districts. Economic Geography; Jul 1996, Vol. 72, No. 3, 1996, 293-313.
15. Baglieri D., Cinic M.C., Mangematin V.: Rejuvenating clusters with sleeping anchors': The case of nanoclusters. Technovation 2011, doi:10.1016/j.technovation.2011.09.003

Acknowledgements
We acknowledge the financial support of the FP7 European project FRIDA (FP7-SSH-2007-1). The work of the Polish team was conducted under the chairmanship of Wojciech Czakon, an Associate Professor at University of Economics in Katowice.

Msc. Patrycja KLIMAS
Department of Enterprise Management
University of Economics in Katowice
40-287 Katowice, ul.1 Maja 50
tel./fax: (0-32) 257 73 02
e-mail: patrycja.klimas@ue.katowice.pl