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FROM NETWORKS TO ACTION NETS: KNOWLEDGE MANAGEMENT IN NETWORKS AND CLUSTERS IN CREATIVE INDUSTRIES IN POLAND

Sławomir OLKO

Silesian University of Technology; olko@polsl.pl, ORCID: 0000-0001-5284-6284

Purpose: The paper presents and practically verifies the concept of Action Nets Creating Emotional Values (ANCEV) which is embedded in network approach in management. The concepts is empirically verified in three cluster organizations operating in Poland.
Design/methodology/approach: The research was conducted with the use of case studies analysis where traditional networks are identified. In the network a nodes represents actors – cluster members while edges represent existing relationships between actors. Then the action net of the cluster is visualized through the Event Process Chain (EPC) diagram. The diagrams in particular presented actions (processes, activities, realized tasks) and states (effects, resources, values) and the relationships between these elements
Findings: Action nets networks and clusters in creative industries could be represented in the form of Action Nets Creating Emotional Values (ANCEV).
Research limitations/implications: The action nets represents relatively temporarily state of affairs, not formally structured. This is the main limitation of action nets identification. With this kind of research the key actions can be identified and also relationships between actions can be defined.
Practical implications: Action nets and particularly ANCEV can be implemented in unformal networks of cooperation in creative industries.
Social implications: An increasing role of creative industries and their impact on society implies the importance of research on knowledge management in creative industries. The approach presented in the paper can be useful for every kind of interpersonal and interorganizational networks.
Originality/value: The concept of ANCEV prepared by the author is new in the paper. The concept and research approach is addressed to researcher and practitioners dealing with cooperation in creative industries and the problem of knowledge management in interpersonal and interorganizational networks.

Keywords: action nets, knowledge management, networks.

Category of the paper: research paper.

1. Introduction

Recent decades have convinced us of the growing importance of cooperation in the processes of social and economic development. The increasingly advanced specialization of entities that participate in the processes of innovation implementation imposes the cooperation within inter-organizational networks. Clusters and innovation networks are an example of organizations enabling cooperation in the field of innovation development and other activities supporting innovation. A special area of inter-organisational cooperation is knowledge management, thanks to which entities in a network or cluster acquire the necessary knowledge, which is used for value creation for the customers. Inter-organizational knowledge management is, however, determined by the nature of inter-organizational relationships: networks and clusters are groups of independent entities, therefore knowledge transfer takes place through the relations of influence and flow reinforced by interpersonal trust. Arrangements and decisions concerning knowledge management in the cluster are made in the process of dialogue, in which entities formulate their expectations relating to the suggested solutions and common standards. Observation of management practices and literature indicates that this type of knowledge management models exist in almost every type of network clusters and in different sectors. They are therefore an important complement to knowledge management at an organizational level (Seufert et al., 2006). In creative sectors knowledge management has a specific nature connected with dominance of tacit knowledge transfer (the role of inspiration, presentation, and solution discussion) as well as significantly bigger rotation of intellectual property such as: copyright laws, industrial designs and utility models. Cooperation in this area is consolidated by unformalised activities, which in the case of their usefulness form networks of activities (Giddens, 1984). A network of activities is the basic process reorienting knowledge management in inter-organizational network. The aim of the article is to present the role of network of activities through their indentification and analysis in three selected creative clusters in Poland.

2. Literature review

Knowledge is revealed and verified in activities – this is a the basic assumtion for analysing knowledge management in this studies. Davenport and Prusak (2000) emphasise that societies and organizations create and accumulate knowledge in order to create value for the environment through actions. Most definitions of knowledge management (Davenport, Prusak, 2000; Wallace, 2007; Jashapara, 2004) point to the process and the cyclical nature of this phenomenon. Part of the process of knowledge management is the application of knowledge in

action, which verifies its usefulness (generating know-how knowledge is based solely on experience) and generates new ideas. The knowledge management process can take place within the organization, based on internal repositories or in networks of independent entities (Alavi, 2000; Seufert et al., 2006). The use of networks is connected not only with knowledge creation, but foremost with creating values for the society, which are provided in the form of products and services. Therefore, knowledge is necessary to undertake action and on the other hand action is the source of new knowledge. A research implication of the above is the necessity to take into account the analysis of key processes, actions, activity in the analysis of knowledge management processes.

In the Resource Based View tacit and explicit knowledge resources are one of the resource forms, which are configured by processes. What Prahalad and Hamel view as key competences is a combination of resources, processes and abilities underlying the competitive advantage of an organization. Key competences may allow for access to important markets or market segments, are the source of benefits (values) appreciated by clients or allow for the creation and management of strategic architecture — network of external connections constituting the grounds for creating value added (Prahalad, Hamel, 1990). Knowledge management is therefore of static nature (accumulated resources of tacit and explicit knowledge), and dynamic - the process of value creation in the network in which value of the final product depends on the value of knowledge obtained by the participants of the network. This process might have a cognitive nature - conscious acquisition, creation and accumulation of knowledge or autopoietic nature dependent on intention, role and value of the network/organisation participants (von Krogh et al., 1994). The latter process of knowledge creation, which takes place in networks and clusters, can be influenced indirectly through: relations of influence and flow, using its position in the network or knowledge resources. The autopoietic process is therefore of social nature - categories of social communication described a.o. by Luhman (1986) are more adequate in its description and understanding.

In management sciences, the essence of knowledge management is shown in the concept of ‘action nets’. It was put forward by Czarniawska (2010), after the proposition by F.H. Allport (1954), who indicated conscious formation of the ‘chain of events’ that is consecutive events, dependent on the entities which influence them. Czarniawska stresses the fact, that a network are radiating connections between different activities in all directions, contrary to a chain, where sequence of events (actions) is assumed. A similar definition of a network was suggested by K. Weick, for whom chain of events does not operate synchronically, and some of them are skipped or looped through the process of sense making (Weick, 1995). A network of activities is therefore a process, however, conscious shaping of the whole process is impossible, especially in networks and clusters of independent entities.

Lindberg and Czarniawska (2006) stressed that ‘The concept of the action net is based on the assumption that organizing (and its special of case: management) requires that several different collective actions be connected according to a pattern that is institutionalized at a given

time and in a given place. The collective actions concerned need not necessarily be performed within the bounds of a specific "organization"' (Lindberg, Czarniawska 2006, p. 293). For this reason the concept is so useful in interorganizational networks and clusters where the several actors are involved in different activities.

Both autopoietic networks of ativites and structural business processes aim at creating value for the customer. Cutomer value is the central concept of business model (Teece, 2010; Ostewalder, Pigneur, 2009), it is strongly determined by expectations and subjective assessment of the customer (customer perceived value). In marketing marketingu customer-perceived value is the difference between a prospective customer's evaluation of the benefits and costs of one product when compared with others (Kotler et al., 2004). The following values can be distinguished: functional value, monetary value, social value, and psychological value. In recent years we have been able to observe an increase in the significance of social values, emphasised by researchers (Gopaldas, 2015), whereas in creative industries the most important are artistic and culture values, which have emotional significance for the customer (Di Maria, Paiola, 2012). The most vital entities in creative sectors are creative enterprises. According to Rosenfeld (2004): "…any company for which the primary value of its products or services is rooted in their emotional or aesthetic appeal to the customer".

In networks and clusters we deal with co-created value - various actors are involved in their creation: economic entities, scientific, academic and business institutions. According to Alves et al. (2015), a particular interest of researchers in value co- creation took place in the period 2012-2014 and in research processes it is connected with four conceptual groups: (1) business logic, (2) new product/service development, (3) co-creative experiences and loyalty, (4) co-creation and relationships.

Analysis of the process of knowledge management involves various research techniques like: knowledge maps and matrices (Probst et al., 2000), network diagrams of knowledge flow using Social Network Analysis (SNA) (Liebowitz, 2005; Borgatti et al., 2013). However, literature on the subject lacks a comprehensive approach which would treat the existing activity of the network as a process integrated with knowledge management. Such an approach would allow to treat knowledge management as a strategic process integrated with the basic activities of organizations or networks that is constituting the essence of business model of an organisation.

3. Research model

Proposed methodology for analysing action nets will be applied to the study creative clusters — clusters existing in creative industries. In the research the following definition of creative cluster will be adopted: "a group of cooperating organizations and individuals

originating from local and regional societies, representing business, science, the arts, culture, education, health, entertainment and leisure activities. The cluster dynamics come from the creation of a regional identity, the innovative utilization of resources and a talent search with the protection and development of local and regional values. The creative clusters are the reservoir of creative resources and skills for other clusters and innovative environments" (Knop et al., 2013) This definition is consistent with the understanding of a cluster in creative sector proposed by Chapain et al (2010), and it results from a wide definition of a cluster adopted by Gordon and McCann (2005), Immarino and McCann (2006) or the most often quoted M. Porter (1998), stressing mostly cooperation between entities forming the cluster.

Analysis of the knowledge management process in a creative cluster requires taking into account the nature of the new environment, especially the existence of knowledge in multi-actor network (inter-organisational knowledge) as well as the specificity of knowledge in creative branch, which to a large extent relates to tacit knowledge and the area of creativity which covers the first stage of the innovative process. The specific system of knowledge management in creative industries was paid particular attention by Chapain et al. (2010), especially the fact that "innovations in these industries tend to present an 'aesthetic', 'artistic' or 'stylistic' element". The nature of the system significantly influences the construction of research models of knowledge management. Therefore, in order to diagnose the process of knowledge management the article author's methodology was applied. According to adopted methodology the analyses in the three substantive areas have been provided: relations between cluster members, key competences of the cluster members and mapping action nets (Olko, 2017).

According to Czarniawska (2010) an action net can be regarded as "a network of interdependent activities carried out by the actors of the socio-institutional network creating value for the environment." In clusters and networks existing in the creative industries, we can speak of the Action Nets Creating Emotional Values (ANCEV), a network that creates emotional values, such as:

- artistic and culture values – artists' creations made available in the form of services in culture facilities: concert halls, theatres, cinemas, museums;
- design values – one of the important types of innovation in creative industries are design-driven innovations. This phenomemnon is described by Verganti (2009), with focus on the role of the designer as well as the nature of the design process. Design values concern both aesthetic aspects and the functional projects and services. The significance of aesthetic values in marketing was appreciated in the 90s (Simonson, Schmitt, 1997);

- ethical and moral values – included in the obeyed norms and values relating to rules of running an organization: respect for human rights and dignity, respect for natural resources, sustainable development or the Corporate Social Responsibility (CSR), which comprehensively encompasses all the issues;
- sentimental values – e.g. sentimental tourism, collector's products.

Table 1.
Characteristics of the analysed cases

Case number	Cluster name	established	number of members
1	Kraków Film Cluster	2013	52
2	Silesia ICT and multimedia cluster	2007	25
3	Dobroteka – agglomeration of furniture makers in Dobrodzień	2012	10

Source: self elaboration.

The choice, description and analysis of cases was carried out through the use of case study methodology in line with the approach by Yin (2003). Two kind of instruments were used in describing the cases:

1. telephone interview with cluster members – for identifying relationships between cluster members,
2. in-depth interview with the coordinator of the cluster – for mapping cluster-specific action nets.

From the telephone interview the network diagrams were created representing the nature existing relationships between cluster members. The following relationships were investigated:

- interpersonal relationship (who knows whom?),
- inspiration relationship (who is an inspiration for me?),
- tacit knowledge exchange (with whom do I exchange tacit knowledge?),
- cooperation relationship (with whom do I collaborate?).

During the research four kind of network diagrams were prepared corresponding to four kind of relationships. In the paper only one type diagram for each cluster is presented: an integrated network of personal relationships and cooperation. To prepare network diagrams and calculate basic network parameters UCINET software were utilized (Borgatti et al., 2013).

Mapping the action nets was conducted primarily on the basis of in-depth interview with the coordinator of the cluster, which was carried out twice. During the first interview, the most important activities carried out by members of the cluster were established and on that basis a scheme of network operations was designed. In the second interview with the coordinator accuracy of the presented action nets scheme was verified (Olko, 2017).

The following research questions were formulated together with the choice of clusters for case studies:

- Which internal relationships corresponds with the key actions taken within the cluster?
- Do cluster members cooperate in terms of creating emotional values?
- What elements does this cooperation concern?

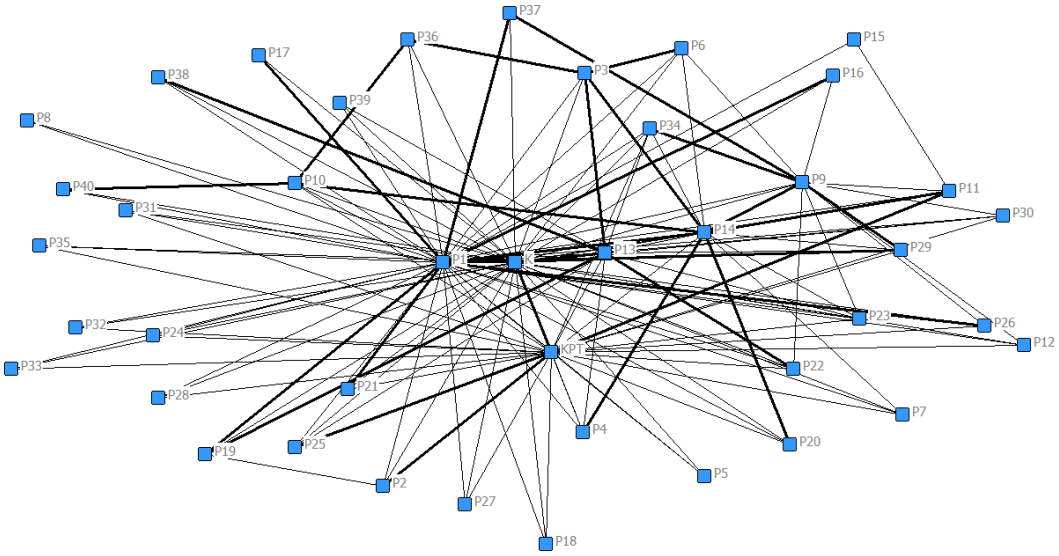
As the result of selection, three creative cluster presented in Table 1 have been analysed.

The network of activities scheme was designed based on the Event Process Chain EPC, which presents activities, static elements – states (resources, effects) as well as interdependencies between these elements. Particular attention was given to the presence of effects in the form of emotional values and possible methods of commercialising these values.

4. Findings

4.1. Case 1: Kraków Film Cluster

Kraków Film Cluster (KFC) was founded at the beginning of 2005 as an agreement, coordinated by Kraków Technology Park (KPT). Thanks to the realisation of an investment project called 'Małopolska Information Technology Park' a number of elements of special equipment for film production, posproduction or multimedia production was purchased in order to create the so-called Multilab.



Network density	Number of ties	Average degree
0,109	221	4,452

Figure 1. Network of interpersonal relationships and cooperation in Cracow Film Cluster.

Source: own elaboration.

The basic function of this facility is the production and postproduction of films and audiovisual effects with the use of highly-efficient computers equipped with specialistic software. Multilab is equipped with:

- 6 workstations with monitors of the highest quality (including reference monitors); 8-10 production workstations,
- room for final technical inspection of the visual materials with a professional workstation for correction of colours and postproduction workstation, sound – showroom,
- FX room – multifunctional room with the motion capture system, green screen (cyclorama), photography station, scanner 3D with the possibility of recording sound.

Figure 1 presents the integrated network existing in KFC, while Figure 2 shows the identified action net in the cluster.

The KFC network of activities presented in figure 2 involves mainly all the stages of film production, starting from preparation, organisation, casting to shooting, renting equipment, specialistic services and postproduction. In order to compete in the internatonal market joint internationalistic actions are being undertaken. What gives the cluster advantage and distinctness among others, especially in terms of creative activites, is cooperation with independent film makers. In order to implement these actions cluster takes advantage of KTP resources.

Among activities currently not being implemented, the ones worth noticing are trainings and workshops in the area of using modern technology in film production and post-roduction. Due to the modern production background as well as cooperating experts with experience in film production, it is the potential further development direction for the network of activities, dependent on the needs and expectations of cluster members and external entities. So far, such actions have not been undertaken.

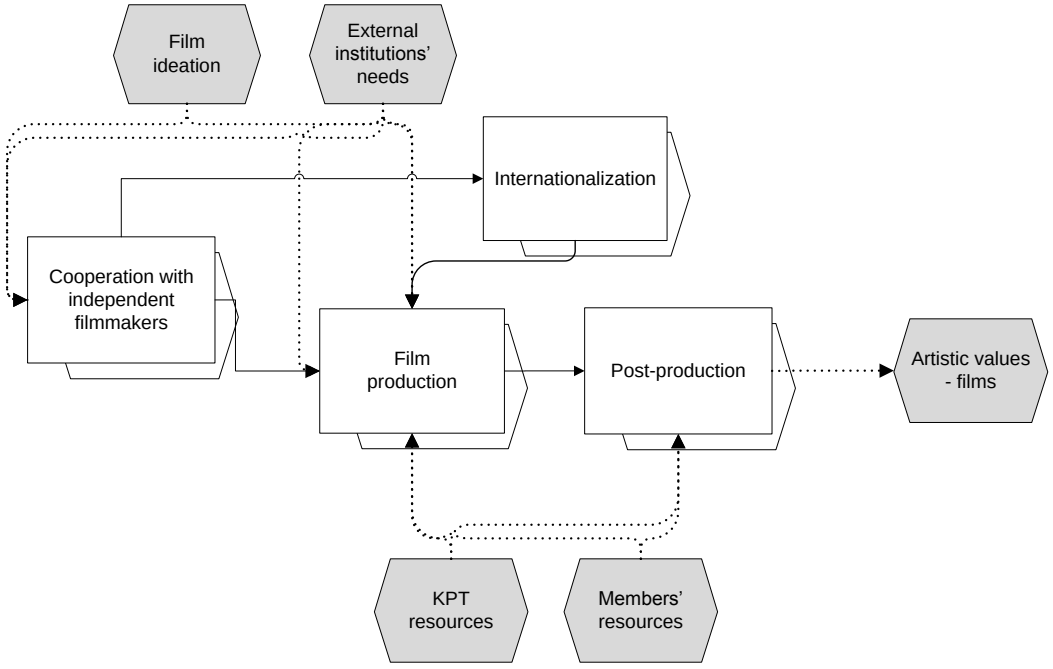
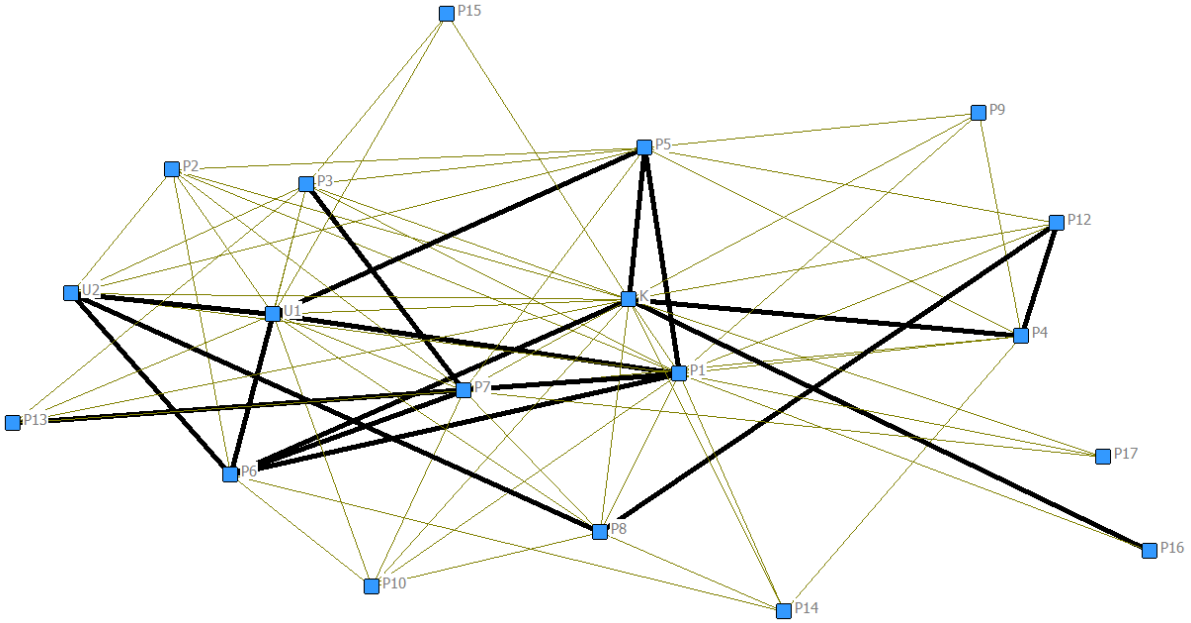


Figure 2. Action net of the Kraków Film Cluster.

Source: own elaboration.

4.2. Case 2: Silesian ICT and multimedia cluster Hub Club

The Silesian of ICT and Multimedia Cluster Hub Club was established in January 2013 on the initiative of a group of entrepreneurs from the ICT sector cooperating with the Rudzki Inkubator Przedsiębiorczości (currently the Silesian Incubator of Entrepreneurship) in Ruda Śląska. The formal coordinator is the Innovare foundation, which acts as a social body supervising the activities of the cluster. The Foundation is located on the premises of ŚIP, which also has its representatives in the Cluster Council. The Hub Club cluster meets cluster management standards. Hub Club is particularly active in internationalization activities, since its inception, 19 international promotional trips have been organized, including to Sweden, Denmark, Germany, Finland, Spain, Brazil and Japan.



Network density	Number of ties	Average degree
0,439	184	7,895

Figure 3. Network of interpersonal relationships and cooperation in Silesia ICT and multimedia cluster. Source: own elaboration.

The research was conducted in the period May - June 2016 by direct contact (e-mail or telephone) with entrepreneurs - members of the Hub Club of the Silesian Multimedia Cluster. 15 respondents took part in the research, and an attempt was made to contact all members of the cluster — 25 respondents on the basis of the available contact list.

The average density of the interpersonal network is relatively high compared to other creative clusters and amounts to 0.338. The high value results from the density of the network is related to the declared large number of acquaintances between Hub Club entrepreneurs. The network of inspiration in the Hub Club has the highest density among all creative clusters in which the research was conducted. This is due to the large number of innovative projects carried out by cluster members, most of them of an application and business nature.

A comprehensive image of the network, which uses two types of relations (acquaintance and cooperation) in the Hub Club cluster is shown in Figure 3. The Coordinator (K) and the Silesian Entrepreneurship Incubator (P1) are in the center of the network. Entrepreneurs P6, P7, P8, as well as both universities - members of the cluster (U1, U2) also have high values of centrality in this network. The relationship of cooperation coincides with the relationship of acquaintance. According to the information obtained from the members, the original relations were the relations of acquaintance, the subsequent relations related to the exchange of tacit knowledge and the relations of trust. With time, among the members of the cluster, along with getting to know the effects of the work of others, relations of mutual inspiration appeared, which in the case of Hub Club are the strongest among all analyzed creative clusters.

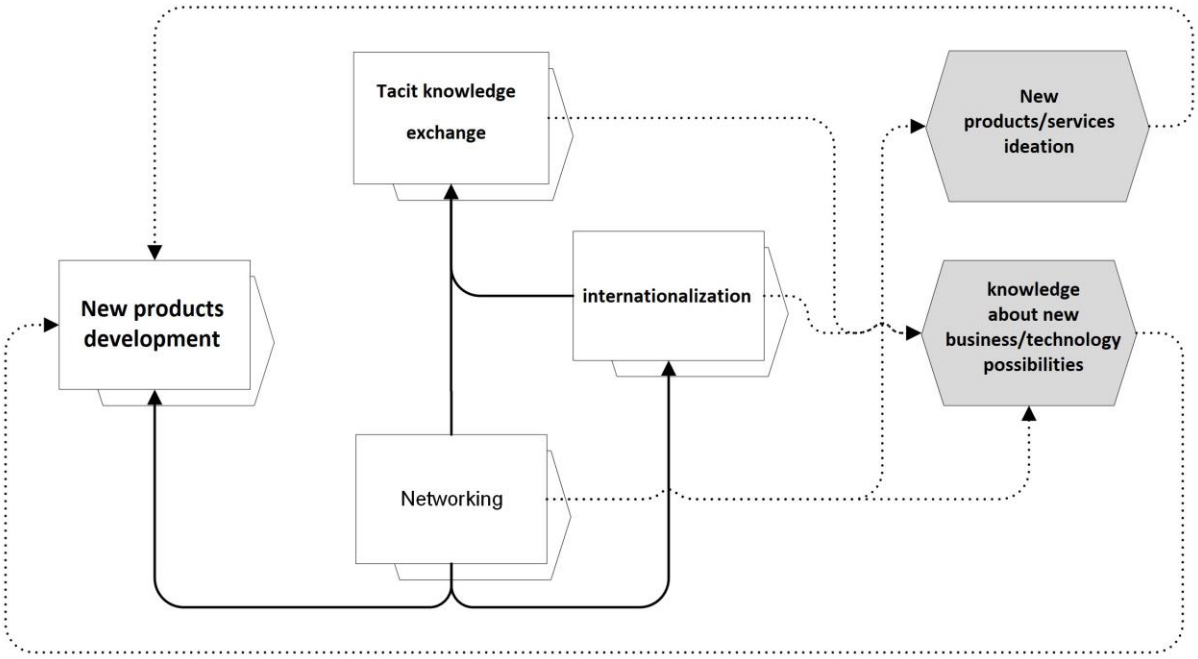


Figure 4. Action net of the Silesia ICT and multimedia cluster.

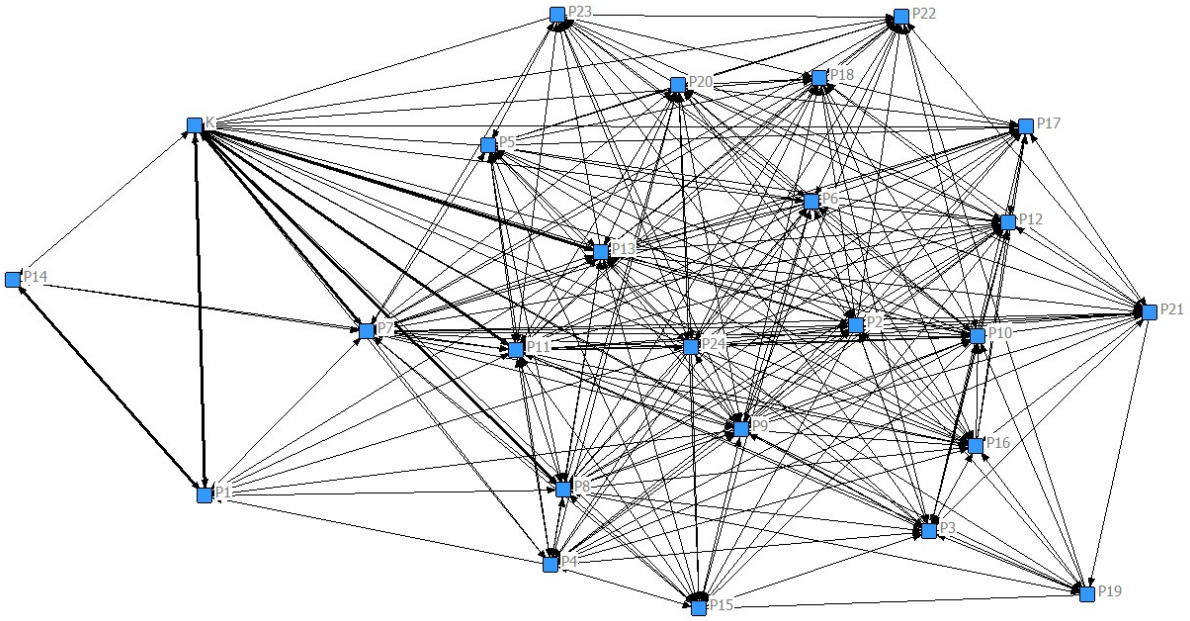
Source: own elaboration.

4.3. Case 3: Dobroteka – agglomeration of furniture makers in Dobrodzień

Dobroteka is not a cluster in terms of the realised cluster policy in Poland as it does not have a formal agreement between its members. Dobroteka is a new type of place selling furniture, administered by MD Connect company, dependent on the renowned furniture manufacturer Kler SA. A small space (2300 m^2), considering the realities of furniture stores, houses the presentation of 10 local furniture manufacturers, as well as the following elements of infrastructure:

- apartment of the future – demonstration and laboratory room, which can be an inspiration for customers and at the same time a place for testing innovative solutions in the field of interior design. This place enables behavioral studies of consumers that can be carried out at the request of furniture and other home furnishing products manufacturers;

- showroom - a place prepared specifically for architects and designers, who can meet their clients here. Samples, catalogs and price lists of all manufacturers whose brands are present in Dobroteka are available here. The place is available free of charge for the designers;
- auditorium and conference room – place for organising bigger events, trainings and seminars;
- historic room – exhibition of traditional Silesian furniture crafts with multimedia screens, creating emotional values among the visitors;
- reading room – equipped with literature and leisure furniture;
- relaxation furniture – the biggest in Poland upholstered piece of furniture (it covers 3 stories of the building). It is a place for fun and leisure for children constituting one of the biggest attractions of Dobroteka;
- 'Dobre Bistro' – a place for the visiors to relax, offering drinks and snacks. The bistro is equipped with chairs which you can buy in the store;
- a place for organising artistic workshops for children and adults;
- artistic exhibitions gallery – a 70 m^2 room for presenting artefacts and projects of design, architecture and interior design.



Network density	Number of ties	Average degree
0,557	334	13,360

Figure 5. Network of interpersonal relationships and cooperation in Dobroteka.

Source: own elaboration.

Its infrastructure determines the unique attractiveness of Dobroteka, providing aesthetic values for visitors who do not buy products. The creation of Dobroteka was subsidized with 6 million PLN from public funds under the Opole Voivodship Regional Operational Programs. Although formally only a few manufacturers rent a spot in Dobroteka, there is also informal cooperation with designers and other local producers. In Dobrodzien itself (over 4000 inhabitants) there are 30 furniture manufacturers, while in the district of Olesno more than 70. In Dobroteka we can distinguish four basic activities carried out for members of the network, each of which is meaningfull in terms of business:

- marketing activity – promoting Dobroteka and its members among Polish and foreign customers, fixed demonstations and displays in Dobroteka;
- providing services for investments – performance of big orders for furniture and interiors from institutional clients, from preparation through realisation and delivery. Activities in the area of serving investments were not initially planned as the aim of the coordinator of Dobroteka. They were born out of the needs of major business clients with specific expectations when it comes to interior design;
- developing creative sensibility – activity for entrepreneurs and clients based on organising trainings and workshops on creativity and furniture design;
- research and development – research on the furniture market in Europe, opinion polls and tesst on the solutions presented in the apartment of the future.

Entrepreneurs on the premises of Dobroteka do not cooperate in the process of production – it is run individually by particular producers. Even in the case of joint deliveries (investment service) making-up the order takes place on spot from the products delivered by producers.

The above tasks are conducted by staff employed by a company administering the furniture store, therefore financed by the income of this entity, yet, they are made for all the entities located in Dobroteka and they affect other furniture manufacturers in Dobrodzień. In comparison to other clusters functioning in Poland, Dobroteka carries out significantly more joint ventures aimed at serving the network members. They also managed to devise a business model thanks to which the undertaken actions are inscribed in the process of value creation for the customers, hence there is a source of funds for these actions. A unique and particularly valuable activity is testing solutions presented in the apartment of the future in Dobroteka. Research of this type does not have its equivalent nationally and consists in qualitative research of client approval of the presented solutions in the available apartment. The equipment in the apartment of the future was supported by public funds from the Opolskie Voivodship Regional Operational Programme. The value of the project called ‘Apartment of the future – modern R&D laboratory created in the MD Connect structure in order to conduct research on model solutions concerning interior design and accessories’ amounted to 490 000 PLN.

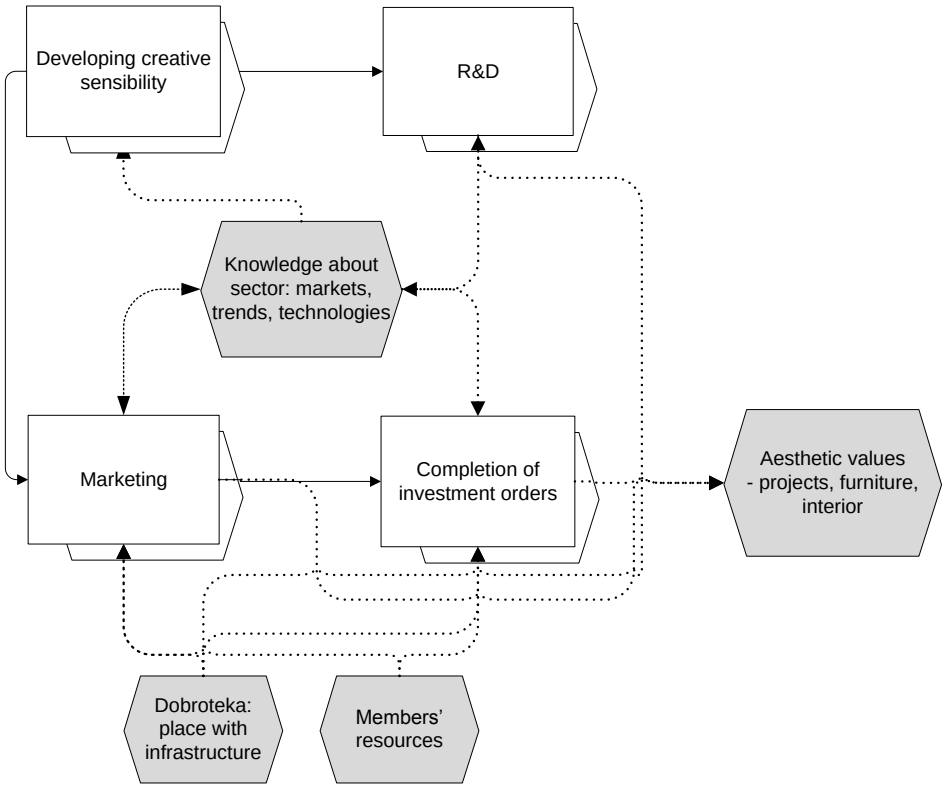


Figure 6. Identified action net of Dobroteka.
Source: own elaboration.

5. Conclusions

On the basis of the collected research results the following conclusions might be formulated in the area of knowledge management in clusters and networks in creative clusters:

1. The established action nets, even though not described or formalised, constitutes the main process of knowledge management in cluster/network, with subordinate knowledge resources and the implemented methods and tools of knowledge management. Supplementary information in the area of knowledge management in cluster are provided by: the analysis of inter-organisational network of relations and map of competencies. The creative clusters under analysis did not have an identified network of activities and they did not analyse inter-organizational relations inside the cluster. The only implemented instrument relating to inter-organizational knowledge management was the characterisation of specialisation and offer of particular cluster members.

2. A action nets is a practical complement to the operational strategy of a cluster. Similarly to the way a business model defines current tasks and resources responding to the strategic objectives, a network of activities defines interconnected activities, which contribute to accomplishing mission and achieving the strategic objectives of a network. A network of activities can identify additional tasks, whose usefulness results from the current needs of cluster members. For instance, the activity connected with completing investment deliveries in Dobroteka, which was not planned or formulated in strategic documents. This example shows that the real network of activities shapes the structure of relations in a cluster or network organisation as postulated from theoretical point of view by Weick (1995) and Giddens (1984).
3. All coordinators of the presented clusters claimed that the identified graphic presentation of network of activities is a useful practical tool being an addition to the cluster strategy.
4. A network of activities undergoes evolutionary changes during the development of a cluster: activities valuable for the cluster members are strengthened and more resources are attributed to them. Actions of low efficiency and usefulness for cluster members are 'suppressed' by gradually limiting the resources. It mostly concerns the actions, which can be more efficiently implemented by cluster members individually, e.g. production, logistics an technology development in Dobroteka, international activities in Hub Club, development of employees in Krakow Film Cluster
5. In all the analysed clusters emotional values, which constitute an essential element of competitive advantage of cluster members, were identified. These are the following values: artistic (Krakow Film Cluster), aesthetic (Dobroteka), social (Hub Club). It is stressed by all coordinators of the clusters that strengthening these values is a strategic objective for cluster development.
6. In the presented examples of creative clusters actions are implemented by members of the network both in cooperation with other members (within the same cluster) as well as individually through members (outside the cluster). Differentation between these activities is not possible which in turns conditions the dependence between actions forming a network. This aspect might constitute a considerable cognitive limitation in the presented research.
7. A strong integrating factor for actions in a cluster are common infrastructural resources. Dobroteka is a furniture store with its infrastructure (apartment of the future, screening rooms, room for children), whereas in the Kraków Film Cluster it is the Multilab infrastructure enabling the realization of post-production activities. Joint infrastructure, financed from public funds, ensures bigger credibility of the members in the eyes of clients rather than individual infrastructure of cluster members. Lack of common resources is a significant limitation in opportunities to implement actions: cluster which does not have common resources, has the least complex of the analysed action nets.

8. Internationalization is a key joint activity realized by the clusters with a very good effects (Dobroteka, Hub Club). This activity is also reported as an effective actions realized in other countries (Kujala&Törnroos, 2018).

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