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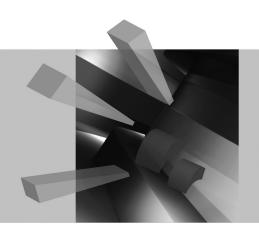
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# Teoria sieci w rozwiązywaniu problemów zarządzania



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Teoria sieci w rozwiązywaniu problemów zarządzania

ISSN 1899-3192

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## INTERORGANISATIONAL NETWORK COMPOSITION AND MANAGEMENT – RESEARCH ASPECTS

**Summary:** Variety of cognitive perspectives in researching interfirm relationships proves that interfirm networks are complex object of research. First of all the interorganisational network research is concentrated on identifying the basic components constituting the network that is nodes and relations. This stream of research is focused on dependence, value and bargaining power. The second import research are is concentrated on managing aspects. In presented article this issue is analysed as activation, combinability and coherence as the features of the organisational space.

**Keywords:** interorganizational networks, dependence, contemporary management.

#### 1. Introduction

The statement on the omnipresence of the network and its exceptional effectiveness during the turbulence of the environment is trivial at this stage of the civilisation development. Both in foreign and Polish higher education institutions the amount of network research has been increasing. Scholars have departed from the research on social networks in organisations which was popular as recently as in the 1990s and significantly more often concentrate their efforts on utilitarian solutions of these systems. The research on the structure of the network composed of nodes and relations, on the one hand, and on the issues of efficient network management, on the other, occupies a special place here.

The aim of this paper is to thoroughly examine the basic theses and hypotheses formulated in the network-related literature and to indicate new research questions. The authors focused in particular on the components of the network structure and the management functions in interorganisational networks.

#### 2. Interorganisational network organisation – nodes and relations

At the beginning, the interorganisational network research concentrated on identifying the basic components constituting the network, that is nodes and relations.

Hence, e.g. P. Bianci and N. Bellini define the components as companies [Kay 1996, p. 118; Bianchi, Bellini 1991, p. 487-497], C. Prahalad and V. Ramaswamy – as parts of an organism, where each component creates a co-value and competes therefor [Prahalad, Ramaswamy 2005, p. 79]. H. Thorelli talks about at least two organisations operating within permanent relations [Thorelli 1986, p. 37].

What results from the research conducted by [Delporte et al. 2004, p. 167-182] is, in turn, that network nodes should be described from the perspective of the relations occurring between them. This enables, for instance, distinguishing the dominant node and the nodes which are dependent thereon. A similar viewpoint is represented by P. McKiernan, according to whom the power of an entity within the network depends on the quality of its relations with the customers, suppliers and competitors, and not on its position in the network. Thus, if the position of a node in the network is to be identified, it may be analysed from at least two perspectives: the position occupied in the network *sensu stricto* and the position in the network determined by the nature and type of relation with stakeholders [McKiernan 1992, p. 106). [Niemczyk 2006, p. 28] in turn, concludes that examining the interorganisational network from the perspective of nodes in the statistical system requires determining the basic parameters of nodes, which include: objective type, number, size, quality, spatial distribution, as well as the role, objective and time evolution of nodes.

Other research [Håkansson, Johanson 1988; Johanson, Mattsson 1985, p. 185-195], in turn, provides guidelines on how to measure the nodes of the interorganisational network. Such research indicates the necessity to identify the position of the node in the network and to determine its strategic identity. When assuming such perspectives, it is possible to specify the bargaining position and the effectiveness of the node. Describing nodes by identifying their position is cognitive in nature and translates into the specific "network theory" [Johanson, Mattsson 1992, p. 217]. The research within this scope allows to state that the activity of nodes triggers actions and, finally, structural changes in the network. E. Yuchtman and S. Seashore treat the bargaining power of the node as a set of its abilities to use and transform rare and valuable resources of the environment [Yuchtman, Seashore 1967, p. 898; Yuchtman, Seashore 1983, p. 228]. It is also worth indicating here the so-called network ability, which, as proved by research, determines the position of the node in the network. The network ability means a set of organisational processes and routines directed at taking advantage of the opportunities related to setting the enterprise within the interorganisational network [Mitrega 2010, p. 101].

The position in the network is always dynamic and relative in nature [Grandori, Soda 1995, p. 183-214]. The "microposition" [Johanson, Mattsson 1985, p. 185-195] specifies the bargaining position of one node with respect to another one. It depends on the effectiveness of using resources by the node and on the effectiveness of establishing relations with other nodes which constitute the network. The microposition reflects the potential of the node referring to the creation of relations with other nodes in the network in comparison to the nodes which cannot establish such

relations or if they can, they do it ineffectively. Apart from the microposition, J. Johanson and L. Mattsson [1985, p. 185-195] identify the macroposition, emphasising that it is a different attribute in terms of quality. The macroposition reflects the role of the node in the entire network, which is dependent on its ability to shape relations between the resources and activities of the nodes which constitute the network. This results partly from the actions occurring inside the node and partly from what the node obtains from actions with other nodes of the network. The perception of nodes from the microposition and macroposition perspectives reflects the role in organising the network.

The relations occurring between the nodes of the network determine the bargaining power of the node and its effectiveness in the process of accomplishing goals [cf. Janhonen, Johanson 2010].

[Håkansson Snehota 2006, p. 138], in turn, argue that the strategic behaviour of the node involves the attempts to influence other nodes if possible, and obtaining benefits from the access to the resources, initiatives and creativity of other nodes. What directly results is that it is relations that have a major influence on the position of the node in the network [cf. Wilkinson, Young 2002, p. 123-132; Gadde et al. 2003].

Hence, the position of the node in the network is determined by interactions and correlations with its partners to the same extent as by the capital, as well as social and personal connections [Anderson et al. 1994, p. 11). It is worth emphasising that the measures of the position of the node may be as follows: centrality [Lomi 1991], structural equivalence [Lomi, Grandi 1993] and clique analysis [Benassi 1993]<sup>1</sup>.

The activities related to coordination in the interorganisational network are presented by P. Andersson, L.G. Mattsson [2010, p. 917-924]. They consider the temporal aspects of the behaviours of nodes as interrelated, constructive and expressed in the market practices of nodes [Kjellberg, Helgesson 2007, p. 137-162; Andersson, Mattsson 2010, p. 917-924). Therefore, the temporal orientation of nodes influences each of them separately and all the others. Additionally, the temporal profile of the activity is strongly related to the activity occurring in the area of exchange between nodes, including strategic actions.

Other authors, A. Grandori and G. Soda [1995, p. 183-214], emphasise that nodes in the network may be analysed from the perspective of the dependence theory, which distinguishes types of dependence in both quantitative and qualitative categories as potential predicates of the network.

When it comes to the issue of interorganisational relations, an interesting suggestion of describing thereof is the one by L.G. Mattsson [1986, p. 102-129], who identifies seven perspectives of describing relations. B. de Witt and R. Meyer [2007,

<sup>&</sup>lt;sup>1</sup> More generally, the perspective of the interorganisational network indicates that the actors of the network are embedded in the network of relations, which results in the occurrence of opportunities and threats/restrictions of their actions [Brass et al. 2004, p. 795-817]. The so-called institutional embeddedness translates into the creation of networks and builds an institutional perspective of perceiving the network [Grandori, Soda 1995, p. 183-214].

p. 218-220], in turn, analyse interorganisational relations exclusively from the perspective of subjects of the relations): independence and dependence relations, which are the basis for establishing and operation of interorganisational networks occurring between suppliers and producers.

They contribute to the acceleration of the development and creation of competitive advantage, among others by improving efficiency [Pham 2005, p. 235-266]. The dependence relations in the interorganisational network result in the fact that the participants-entities of such a relation may obtain a higher quasi-rent from the relation by reducing the costs [Dyer 1997, p. 535-556]. G. Gereffi et al. [2005, p. 85], in turn, allowed to distinguish five types of interorganisational relations from this perspective, which are analysed against three variables. Individual types differ in the values of three major variables:

- the complexity of establishing transactions,
- the degree to which this complexity may be reduced by codification,
- the scope within which suppliers have the abilities to satisfy the requirements of purchasers.

The relations between the interorganisational relations and creating value are an interesting research area from both cognitive and business point of view [Lefaix-Durand et al. 2005]. The research in this respect indicates three crucial components: the effects of interorganisational relations, the nature of exchange between enterprises, and the management of exchange between enterprises.

Similarly, the research conducted by S. Castaldo [2007, p. 36] analyses relations in the interorganisational network from the perspective of the economic rent. S. Castaldo suggests the need to diversify relational resources depending on whether the relations are an internal component of the network's partner, or result from the involvement in relations with other partners (external dimension). Relations may be diversified also depending on the origin of the relation. Internal and external relational resources are distinguished here.

The value of the network, according to M. Kramarz [2008, p. 85], depends on the type of the relations which compose it. Network relations are based on the exchange of certain information, sharing resources in the network or the exchange of people between the organisations which form it. The resources in the network are subordinated to the information and knowledge flowing through them. Every network has its nodes and edges. If the size of the nodes decreases, the number and quality of relations increases. When the number of nodes increases asymmetrically, the value of the network increases exponentially. This means that self-enhancing circles are present in networks. Each additional participant increases the value of the network, which, consequently, attracts other participants in accordance with the benefit spiral.

The results of the research conducted by the authors, who are interested in the composition (essence) of interorganisational networks, presented in this part of the paper, indicate the particular significance of the quality of the relations occurring between nodes. The essence of the network is relations, their types, quality, structure,

etc. They constitute the strength of nodes, of the entire network. And the whole network management ought to be subordinated to them.

#### 3. Functions of interorganisational network management

Many more questions concern the problem related to the interorganisational network management. The classic management literature referring to the four basic functions of management in network is not sufficient, since networks are a specific system, too complex, with strongly dispersed organisational authority. They lack a classic hierarchy, the subordination at work, full ownership of resources, central control system and many other features of a classic organisation. Instead they have multi-directional relations, nodes differentiated in terms of significance, specific entrepreneurship and interdisciplinary creativity.

Unfortunately, the world literature does not provide too many research results, which aimed at learning the capabilities of interorganisational network management. The majority of the research to date has concerned the analysis of managing individual types of networks based on outsourcing, franchise, cooperation, and most often they are related to the cognition of the tactical-operational level of management.

One of the few proposals is the work by T. Jarvensivu and K. Moller "Metatheory of network management: A contingency perspective". These authors made an overview of the achievements of the world scientific circles in the indicated field and pointed to the deficit of works of such a type. They themselves constructed their own set of network functions as follows: framing, activating, mobilizing and synthesizing [Jarvensivu, Moller 2009, p. 658], by adapting the proposals by Agranoff and McGuire. In particular, "[...] framing as establishing and influencing the operating rules of the network and altering the perceptions of the network participants; setting goals is a part of this task. Activating includes the process of identifying participants and structuring the network; mobilizing involves building commitment among actors. Finally, synthesizing is related to organizing and controlling; it involves creating conditions for productive interaction while preventing, minimizing, and removing obstacles to cooperation [Agranoff, McGuire 2001, p. 298-300].

In 2001 a similar proposal as to the function of managing network organisations was formulated in the work "Zarządzanie firmą" [Strategor 2001]. Although in the original approach the authors of the said paper wrote about activation, combinability and coherence as the features of the organisational space, in practice those dimensions concern the strategic management level. Those three features, and speaking in the classic language – management functions complemented with subfunctions, are real opportunities to manage the network effectively according to the authors of this paper.

In practice activation may embrace actions related to the development of effective leadership and organisational entrepreneurship [Duane Ireland et al. 2003], i.e. everything which allows activating (releasing) the potential of nodes. Activation

is close to activating and mobilising according to the aforementioned concept by Agranoff. Activation still requires cognition. Perhaps many processes occurring in this field do not require a particular intervention from the environment? Perhaps the process itself of releasing initiative results from the preservation of the specific structure of resources (dissipation or self-organisation processes).

The second dimension is combinability. This is a set of actions oriented on eliminating barriers existing between network nodes that want to cooperate. And here again one may invoke the two fundamental characteristics of human behaviour. Either this will be developing rigid frameworks, procedures or schemes of teaching cooperation, or such a climate of innovativeness and entrepreneurship is created wherein such processes will occur spontaneously. Practical solutions may be: increasing labour flexibility, introducing process and project structures, implementing dissipative structure components [Tarasiewicz, 2010, p. 57] or structures displaying features of compound systems.

The majority of detailed guidelines for action will be found in the field of coherence, since the early research on network concentrates here (social networks). It is also easiest here to transpose the solutions from a classic organisation, obviously only those related to the so-called soft management. "Cohesion/coherence of networks reflecting the features of the correlations between the network participants at the given moment or the strength/character of the relationships between the network subjects, the direction of those relationships and the relations between active and passive relationships" [Piórkowska 2012]. Coherence may be achieved by increasing the involvement of the network participants at the operational, informational, social and investment level [Czakon 2005, p. 12]. In addition, forming the so-called common interest, the common shared system of fundamental values, the climate of loyalty and trust, will also be favourable to the organisational coherence.

The foregoing proposals do not mean a total break with the classic set of functions. Organisations still have to plan, organise, motivate and control their actions to a certain extent. They will do this, however, at the lower management level – tactical and operational one.

Little space in research on network management methods is devoted to two other sets of actions, without which it is difficult to speak of effective impact on nodes and relations. Those functions are: coordinating and communicating. Networks are such complex systems that efficient communicating and coordinating is a *sine qua non* condition. In addition, these are closely correlated processes. According to T. Weitzel, D. Beimborn and W. Konig, coordination and in particular coordination costs are closely related to the processes of communication in the network. This is manifested above all in that "[...] coordination costs embody the costs of developing and implementing a network-wide communications base comprised of a specific constellation of standards which considers the individual, heterogeneous interests of all actors. Concretely, these include costs for time, personnel, data gathering and processing, and control and incentive systems" [Weitzel et al. 2003, p. 195].

From this perspective it should be stated that again the classic understanding of coordination as instruments for distribution of working actions in time and space in the dynamic and statistical approach lost its strategic significance and was replaced with tools for accurate communication of solutions from the tactical-operational field. A hypothesis may be ventured that the strategic context of coordination inevitably supports the strategic communication processes. Such a hypothesis requires further scientific research, though.

The aforementioned communicating was the object of spectacular research when the problem of social networks was analysed. Currently it returns to network management as a function allowing the connection of strongly diversified nodes, connected by multiple various types of relationships, allowing conducting negotiations, which are characteristic for networks, as to resources. Many networks have the project composition. In this situation the significance of communicating grows even more.

Apart from the function profile, one can look at network management from the perspective of management levels: thus, the set of actions specific for the level of strategic management and tactical-operational level will be obtained. The lack of monograph research papers can also be noticed here. This results above all from perceiving the network as a strongly dispersed object, wherein the strategic top cannot be distinguished, hence the straightforward conclusion that strategic management is impossible. Networks based on franchise or outsourcing, in turn, are treated by the majority of scholars as classic organisations which have a strategy, tactics and depending on scale – operational actions. And this is why they are attributed classic functions and management levels. The image of network strategies, and in particular an attempt to explain the mechanisms of the emergence of strategies in dispersed networks, may be the object of very interesting research. Although the theory of games and the systemic approaches may be invoked here, most probably the best results will be yielded by the combination of efforts made by scholars from the field of management, economics, other social sciences, as well as exact sciences. Even analogies may be creative in this respect.

Operational management in networks derives behaviour models primarily from the achievements of process and project approaches, since at this level of discussion the network features are consistent with the characteristics of process or projectoriented organisations.

The current achievements in the identification of network management functions and the potential research directions indicated in this chapter are very often of utilitarian nature. It should be believed that subsequent research in this field of the network knowledge will fill the existing cognition gaps.

#### 4. Implications for research

Interorganisational networks nowadays are an extremely interesting research object. They are a specific challenge for scholars.

Apart from the new research challenges related to the network nature indicated in this paper, many more can be pinpointed, e.g. related to:

- formulating convincing and widely recognised concepts that would help better understand how networks survive in the long term and what factors govern their development,
- harmful effects of the network operation and the threats that this form may bring

   networks of correlations in certain conditions may impede innovativeness and
   hamper learning, as well as limit the capability of acting and narrow down the
   selection for its participants,
- the fact that networks of correlations may underlie the existence of systems that from the social point of view are regarded as pathological, such as mafia structures or corruption relations.

Borgatti and Foster already in 2003 proposed "[...] a typology of network research, which cross-classifies network studies according to the classic dimensions of explanatory mechanisms and explanatory goals or styles. The dimension of explanatory goals/styles distinguishes between an orientation toward modelling variation in performance and other value-laden outcomes, and an orientation toward modelling homogeneity in actor attributes, such as attitudes or practices" [Borgatti, Foster 2003, p. 1006]. Since that time not much has changed. The field of cognition, comprehension and explanation of the network nature, its specific phenomenon, has been still the object of analyses.

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#### STRUKTURA I ZARZĄDZANIE SIECIĄ MIĘDZYORGANIZACYJNĄ – PERSPEKTYWY BADAWCZE

**Streszczenie:** Wielość perspektyw poznawczych w badaniach sieci międzyorganizacyjnych dowodzi, jak złożonym obiektem poznania naukowego są sieci międzyorganizacyjne. Przede wszystkim badania koncentrują się na wierzchołkach i relacjach, ze szczególną intensywnością badania relacji. W takim ujęciu podnosi się zagadnienia zależności w sieci relacji, wartości oraz siły przetargowej. Kolejną ważną perspektywą badawczą są funkcje zarządzania. W artykule ten aspekt analizowany jest w ujęciu aktywizacji, potencjału kombinacyjnego oraz spójności.

Słowa kluczowe: sieć międzyorganizacyjna, zależności, współczesne zarządzanie.