

# KNOWLEDGE MANAGEMENT AT NETWORK ORGANISATIONS

## Introduction

The term "network organisation" is well established in the modern theory and practice of management. One of the triggers to create network organisations is knowledge, which is also an effect of their functioning. As any other resource, knowledge is also subject to management. Skilful knowledge management can considerably increase the effectiveness of a network organisation.

The aim of this article is to show the specific role of knowledge resources at a network organisation and to present a model of managing these resources at the level of one network unit and at the level of an entire network. The article starts with the discussion on the essence, features and typology of network organisations, after which it provides an analysis of knowledge management in a network organisation.

## 1. The essence of a network organisation

A network organisation is a voluntary association of independent organisations cooperating with each other, which, by common use of their complementary resources, reach specific objectives, thereby increasing the effectiveness of their activities. Parameters distinguishing a network organisation from other organisations are:

- a constant transfer of material and non-material resources among the participants (units) of the network;

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- a specific, cooperative type of relations between enterprises, which can occur in various forms: hierarchical (one of the entities is dominating), horizontal, or unconstrained market contacts;
- a limited scope of integration of the entities creating a network organisation, resulting from a constant aspiration of the network organisation participants to implement individual objectives, strategies and values;
- creating common and integrated communication channels enabling a multidirectional communication among network participants;
- geographical dispersion (with the exception of clusters);
- considerable flexibility concerning the configuration and composition of the participants across time.

The basic principle of a network organisation is to reach the effect of synergy. It is only possible when all the network partners apply appropriate coordination mechanisms. Depending on the type of network, it can have one coordinator or it can consist of several equal entities. A network coordinator (or a flagship, broker or network centre) assumes the role of the main controller who organises the flow of material and non-material assets among other independent companies, thereby ensuring that the expectations of final clients are effectively satisfied<sup>1</sup>. The function of the network coordinator can be performed by a reputable organisation of a given region, an entity with appropriate resources or an organisation performing a specific function in the process implemented by the network. For a network organisation, it seems reasonable to talk about the so-called multifarious coordination covering all the three forms of coordination: hierarchical, market-related and social<sup>2</sup>.

Network organisations function with a reduced role of hierarchical structures, preferring informal relations among the specific entities they are composed of. Bilateral contacts can occur not only between the network centre and its other units. Also bilateral contacts between the network entities excluding the centre are possible<sup>3</sup>, whereby the network entities are interdependent, but their relations are unconstrained<sup>4</sup>.

A network organisation is often presented as a transitional form between a hierarchical structure and the so called organisations formed by market features<sup>5</sup>. It is

<sup>1</sup> J.C. Jarillo, *Strategic Networks. Creating the Borderless Organization*, Butterworth-Heinemann, Oxford 1995, p. 6.

<sup>2</sup> W. Czakon, *Koordynacja sieci – wieloraka forma organizacji współdziałania*, „Przegląd Organizacji” 2008, No. 9.

<sup>3</sup> J.B. Quinn, *Intelligent Enterprise. A Knowledge and Service based Paradigm for Industry*, The Free Press, New York 1992, p. 120.

<sup>4</sup> J. Staszewska, *Rozwój przedsiębiorstw sieciowych w Polsce – perspektywy dla klasteringu*, „Przegląd Organizacji” 2007, No. 11.

<sup>5</sup> M. Van Alstyne, *The State of Network Organization: a survey In Three Frameworks*, “Journal of Organizational Computing” 1997, No. 7, after: *Komunikacja wewnętrzna w organizacjach sieciowych*, S. Lachiewicz (ed.), Monografie Politechniki Łódzkiej, Łódź 2008, p. 12.

highlighted that a network organisation is based on trust, engagement and reputation of internal entities, not on hierarchy and vertical relations of a professional nature. Decisions concerning the resources in network organisations are taken not only integrally by the transaction parties, but also collectively by cooperating parties, and the flow of resources between cooperating partners is repetitive, not casual<sup>6</sup>.

In network organisations creating interpersonal networks among the employees of component entities is supported, which enhances the cooperation processes. As a result of weaker hierarchical dependencies and power structures, the level of flexibility and adaptability increases, as well as the support for entrepreneurial responses to new opportunities. Relations between the components of a network structure provide therefore channels for direct communication of task-oriented people, not power-oriented ones. It makes it possible to gain knowledge quickly, and the multilateral and mutual nature of information exchange is the basis of cooperation and network operation<sup>7</sup>.

Other features of network organisations are: the implementation of a common goal with the simultaneous struggle to reach autonomous objectives by individual entities; the tendency of the entities to specialise within the network; a considerable role of internal communication of the so-called information culture ensuring a free flow (vertical and horizontal, formal and informal) of knowledge and information; investing in relations<sup>8</sup>.

Not all networks are established on a voluntary basis<sup>9</sup>. A considerable number of network organisations is established as a result of various kinds of compulsion, where being a member of a network is a condition of survival or reaching a specific success by an enterprise. However even in such situations, a potential member makes a specific analysis of benefits and losses before a joining a network.

The condition of becoming a member of a network organisation is to comply with the criteria set by the network. These are mostly the criteria of complementarity and compatibility applied in relation to units already operating within the network. The image of the network created so far as well as the reputation of the potential candidates is also taken into account in the process of including new entities in an already existing network.

The main benefit resulting from the membership in a network organisation is the optimization of operational costs of its individual members. It can be done by

<sup>6</sup> K. Łobos, *Organizacja sieciowa*, in: *Zarządzanie przedsiębiorstwem przyszłości*, K. Perechuda (ed.), Agencja Wydawnicza „Placet”, Warsaw 2000, p. 97.

<sup>7</sup> B. Mikuła, *Organizacja oparta na wiedzy*, Wydawnictwo Akademii Ekonomicznej w Krakowie, Cracow 2006, p. 78.

<sup>8</sup> J. Staszewska, *Rozwój przedsiębiorstw sieciowych w Polsce – perspektywy dla klasteringu*, op.cit.

<sup>9</sup> It is indicated by, among others: J. Curran, R. Jarvis, R. Blackburn, S. Black, *Networks and Small Firms: Construct, Methodological Strategies and Some Findings*, “International Small Business Journal” 1993, No. 11.

means of a common implementation of some functions and processes, as well as by an elimination of repetitive units of the value chain of produced goods or services.

Additionally, network organisations, using their horizontal relations, can respond to market signals more quickly, by flexible adaptation of the configuration of the common resources to the implementation of individual undertakings and business projects<sup>10</sup>.

The specific character of network organisation features results in their considerable differentiation. This, in turn, translates into the multitude of typologies of network organisations. The most common criteria of classification of network organisations are: the level of members' dominance; the structure of the network; type of activity; the rate of integration and strength of relations of the partners; the stability of relations; the dynamics of the network's reconfiguration; the region of origin; the scope of influence; and the declared type of business model.

In respect of the level of the coordinator's (broker's) dominance and the relations between the system members, the following types can be distinguished: dominated networks (broker having bilateral relations with a range of satellite companies); and networks of equal partners (lack of one broker, all partners develop mutual links in the process of cooperation)<sup>11</sup>.

A similar classification of network organisations is made in respect of the network's structure, and specifically – the number of decision making centres. There can be one-centre (concentrated) networks; multi-centre (equal partners) networks; and dispersed networks (cooperating in an incidental manner).

In respect of activities carried out, there can be demand-related networks (referring to their relations with clients), supply-related networks (referring to cooperative links used in the process of supply of goods and services); and support networks (referring to the support relations in partnership systems)<sup>12</sup>.

On the other hand, a basis network organisations classification can be the nature of the relations among the network members. Such a classification would include: supplier networks, producer networks, client networks, technological cooperation networks and standard coalitions<sup>13</sup>. There can also be a classification covering: "star" networks, Peer to Peer networks and subcontractor networks<sup>14</sup>.

<sup>10</sup> More information in: *Elastyczność organizacji*, R. Krupski (ed.), Uniwersytet Ekonomiczny we Wrocławiu, Wrocław 2008.

<sup>11</sup> J. Child, D. Faulkner, *Strategies of Co-Operation. Managing Alliances, Networks and Joint Ventures*, Oxford University Press, Oxford 1998, p. 120.

<sup>12</sup> J. Bryson, P. Wood, D. Keeble, *Business networks, Small Firm Flexibility and Regional Development in UK Business Service*, "Entrepreneurship and Regional Development" 1993, No. 5.

<sup>13</sup> M. Castells, *Społeczeństwo w sieci*, Wydawnictwo Naukowe PWN, Warsaw 2008, p. 195.

<sup>14</sup> A. Jurga, *Technologia teleinformatyczna w wirtualnej organizacji przedsiębiorstwa*, PhD Thesis, Faculty of Organization and Management of the Łódź University of Technology, Łódź 2007, p. 14, after:

A combination of two criteria: the type of relations among the network members and the type of environment where a network operates, makes it possible to distinguish other categories of network organisations:

- empty networks, within which transaction relations among their members are dominating and the environment is variable;
- variable networks, where the environment variability rate is relatively high and the network members' relations are of a cooperative nature;
- networks with added value, where the environment variability is low, and transaction relations among the members are prevailing;
- virtual networks, where the environment variability rate is relatively low and the network members' relations are of a cooperative nature<sup>15</sup>.

Another criterion of network organisation classification can be the stability and strength of interrelations among the network entities. In this case the following types can be listed: integrated networks (consisting of dispersed units that legally or financially belong to one group); federated networks (consisting of legal entities or physical persons willing to reach their common objectives this way); contract networks (based on concessions or franchise agreements concluded by statutory independent partners); and networks of direct relations (observed in the area of political or religious activities, but also in the area of direct sales)<sup>16</sup>.

The necessity of constant adaptation to the needs of the market environment forces considerable flexibility on a network organisation. In respect of dynamics of a network reconfiguration the following networks can be distinguished: static network organisations (characterised by stable relations among partners and dominance of one of them); dynamic network organisations (characterised by unstable relations among partners and lack of dominance of any of them); temporary network organisations (oriented at a quick use of short-term and specific market opportunities)<sup>17</sup>.

The way network organisations are created and function is considerably influenced by cultural conditions and economic traditions of a given region. The criterion of geographical region is the basis of the classification of far-eastern networks as: Japanese (so-called *Zaibatsu* and *Keiretsu*) Korean (so-called *Chaebol*); and Chinese (*Guanxi*)<sup>18</sup>.

*Komunikacja wewnętrzna w organizacjach sieciowych*, S. Lachiewicz (ed.), Monografie Politechniki Łódzkiej, Łódź 2008, p. 17.

<sup>15</sup> *Zachowania sieciowe w procesie internacjonalizacji*, K. Fonfara (ed.), PWE, Warsaw 2009, p. 40.

<sup>16</sup> P. Boulanger, *Organisel, l'entreprise en réseau*, Nathan, Paris 1995, after: J. Brillman, *Nowoczesne koncepcje i metody zarządzania*, PWE, Warsaw 2002, pp. 426–427.

<sup>17</sup> T. Ortega, *Die Informationstechnologische Unterstützung innovativer Organisationsformen*, after: *Komunikacja wewnętrzna w organizacjach sieciowych*, S. Lachiewicz (ed.), Monografie Politechniki Łódzkiej, Łódź 2008, p. 21.

<sup>18</sup> M. Castells, *Społeczeństwo w sieci*, Wydawnictwo Naukowe PWN, Warsaw 2008, p. 181–185.

In respect of the scope of influence of a network organisation, the following types can be distinguished: local (regional) networks created by enterprises carrying out activities on a given territory; national networks; international networks; and global networks<sup>19</sup>.

The implemented business model can also be a criterion of a network organisations classification. The basis of such an approach is a specific configuration of functions performed by an enterprise as a part of its value chain. Within this classification, network organisations functioning according to the model of operator, integrator or conductor can be distinguished. The operator model consists in focusing on one chosen element of the chain, while the others are implemented by external enterprises selected within necessary processes. This type of activity is carried out by outsourcers, who perfectly perform their business functions and who concentrate their useful resources. The integrator model assumes an extension of the value chain by additional links, in order to enable the control of the entire process of creating the final product or service, starting with the control of obtaining raw materials processes, and ending with, for example, financing the clients obtaining the products. The conductor model covers such a configuration of resources and processes, which allows the enterprise to focus on key processes and resources, and to use a partners' network to implement the entire value chain, thereby creating a network organisation<sup>20</sup>.

## 2. Knowledge resources at a network organisation

Knowledge plays a specific role at a network organisation. On the one hand it is a determinant and main reason for creating network structure, on the other – it is the effect of functioning of these structures.

Knowledge is also a general collection of information and skills used by individuals to solve problems<sup>21</sup>. Knowledge consists of true statements and beliefs, views and ideas, opinions and expectations, methodology and *know-how*<sup>22</sup>. In a broader definition, knowledge is any collection of information, views, beliefs, which is featured by a cognitive and/or practical value, while in a more specific sense – it is a general collection of reliable information on reality, along with the ability to use it<sup>23</sup>.

<sup>19</sup> *Doskonalenie struktur organizacyjnych przedsiębiorstw w gospodarce opartej na wiedzy*, A. Stabryła (scientific editor), C.H. Beck, Warsaw 2009, p. 62.

<sup>20</sup> More in: K. Oblój, *Strategie organizacji*, PWE, Warsaw 2007.

<sup>21</sup> G. Probst, S. Raub, K. Romhardt, *Zarządzanie wiedzą w organizacji*, Oficyna Ekonomiczna, Cracow 2002, p. 27.

<sup>22</sup> K.M. Wiing, *Knowledge Management Fountain*, Schema Press, New York 1993, p. 39.

<sup>23</sup> *Nowa encyklopedia powszechna PWN*, PWN, Warsaw 1996, Vol. 6, p. 733.

Knowledge of a network organisation is not only the sum of knowledge of individual entities (links), but also common knowledge of the entire network, created as a result of the diffusion of knowledge among network elements.

The specific character of knowledge, compared to other resources owned by a network organisation, is reflected by its features<sup>24</sup>. Firstly, knowledge is inexhaustible. The value of knowledge does not decrease with time, as it is the case of other production factors, quite the opposite, it is constantly growing. The bigger the rate of the use of knowledge, the greater the value of knowledge. Secondly, knowledge is simultaneous. Unlike traditional production factors, knowledge is a resource which can be used simultaneously in many places, by many people or organisations. Thirdly, knowledge is non-linear. An equal quantity of knowledge used simultaneously at two organisations can give totally different effects. The effect of economies of scale does not always occur for knowledge. Fourthly, knowledge is undefined in respect of use, effects, "carriage", outlays and the risk of use.

Moreover, knowledge<sup>25</sup>:

- is an intangible resource,
- is constantly renewing and developing,
- is asymmetrical (with reference to particular links, units),
- can be duplicated and transferred in time and space,
- is a non-rival good,
- is very diverse (just as the reality it reflects),
- is characterised by the feature of synergy (combining it results in added value),
- is characterised by a diverse rate of certainty and generality,
- can be objective or subjective.

Additionally, knowledge resources have a unique ability to structuralise in technologies, procedures, organisational documentation, people's competence and data bases, as well as the ability to materialise in products and services. Consequently, knowledge can be a market product, which can be an object of sale transactions between network units, as well as between a network organisation and its environment.

The features mentioned above make knowledge resources difficult to duplicate, restricted in respect of possibility of substitution, and complementary to other resources. That makes knowledge a strategic resource from the perspective of functioning of a network organisation<sup>26</sup>.

<sup>24</sup> A. Sopińska, *Wiedza jako strategiczny zasób przedsiębiorstwa. Analiza i pomiar kapitału intelektualnego przedsiębiorstwa*, 2nd edition, Oficyna Wydawnicza SGH, Warsaw 2010, pp. 89–91.

<sup>25</sup> Based on: B. Stefanowicz, *Wiedza. Wybrane zagadnienia*, Oficyna Wydawnicza SGH, Warsaw 2011, pp. 22–27.

<sup>26</sup> A. Sopińska, *Wiedza – zasób strategiczny współczesnego przedsiębiorstwa*, in: *Przedsiębiorstwo wobec wyzwań globalnych*, A. Herman, K. Poznańska (ed.), Vol. 2, Oficyna Wydawnicza SGH, Warsaw 2008, pp. 67–83, p. 405.

The access to knowledge resources can affect a network structure and its competitiveness. The desire to obtain it or to create it can be the first reason to establish a network, since knowledge enables the development of other resources of a network organisation.

The reference literature provides many typologies of knowledge resources. Not all of them are however important from the point of view of a network organisation functioning. Only those classifications which significantly affect the method of knowledge management at network organisations are presented below.

Depending on the level of abstraction and complexity of knowledge, this resource is divided into concrete knowledge used for specific applications in a specific time and place, and abstract knowledge used in many more situations than the specific knowledge<sup>27</sup>. With reference to a network organisation, knowledge can be divided into knowledge with a specific application in particular network units and knowledge resources broadly applied across the network.

Depending on the source of knowledge, there can be knowledge created inside the organisation by its units or one that comes from outside. Additionally, there can be knowledge derived from scientific examination of the reality; processes of intellectual perception and assessment; conscious use of existing algorithms; and creative solutions of new problems<sup>28</sup>.

Considering the criterion of the form of knowledge presentation, it can be divided into: codified knowledge, knowledge presented in the form of data bases, knowledge maps, reports etc.; individually personalised, owned by individual units, covering individual skills, competencies and behaviour schemes; collectively personalised, created by bases, skills, behaviour habits within a group, derived from common experience in the area of task implementation<sup>29</sup>. For a network organisation, a unit can be both an individual person and an entity being a network member.

Important criteria used to distinguish knowledge resources of a network organisation are: the level of the knowledge innovation and the scope of the use of knowledge by the network. Consideration of both these criteria makes it possible to classify knowledge resources in one of the four categories: unique (niche) knowledge; key knowledge; universal knowledge; and insignificant knowledge (figure 1).

<sup>27</sup> M.H. Boisot, *Knowledge Assets. Securing Competitive Advantage in the Information Economy*, Oxford University Press, New York 1999, pp. 13–14.

<sup>28</sup> A. Glińska-Noweś, *Kulturowe uwarunkowania zarządzania wiedzą w przedsiębiorstwie*, Dom Organizatora TNOiK, Toruń 2007, p. 26.

<sup>29</sup> M.J. Stankiewicz, *Próba modelowania procesów zarządzania konkurencyjnym potencjałem wiedzy w polskich przedsiębiorstwach*, in: *Zarządzanie wiedzą jako kluczowy czynnik międzynarodowej konkurencyjności przedsiębiorstwa*, M.J. Stankiewicz (ed.), Dom Organizatora TNOiK, Toruń 2006, p. 344.



Figure 1. Categories of knowledge resources at a network organisation

Level of knowledge innovation	High	Unique, niche knowledge	Key knowledge
	Low	Insignificant knowledge	Universal knowledge
		Small	Broad
		Scope of knowledge use	

Source: own study.

Niche knowledge is characterised by a high level of innovation, but the possibility of using it by a network is restricted to a small scope of activities or it is used only by a single network unit.

Key knowledge covers innovative knowledge, which can be used by an entire network for many purposes.

Universal knowledge, as its name would suggest, is broadly available knowledge with a low rate of innovation, yet it is broadly applied across the network organisation.

The last category of knowledge resources at a network organisation is knowledge insignificant from the point of view of the entire network, since this type of knowledge is not very innovative and it is applied in a very small scope, for example by one network unit.

From a network organisation perspective, a division of knowledge into tacit (hidden) knowledge and formal (explicit, publicly available) is of key significance<sup>30</sup>. Tacit knowledge is of primary and personal nature. It is difficult to be identified and expressed, because it is activated intuitively. It is impossible to duplicate or imitate it completely. Unlike tacit knowledge, formal knowledge can be easily presented using speech, documents, schemes, symbols etc. It is secondary, non-personal knowledge, easy to be identified and codified.

Network organisations apply also other classifications of knowledge. One example can be

- a typology based on a strategic evaluation in comparison with a company's competitors (innovative knowledge, advanced knowledge, core knowledge)<sup>31</sup>;

<sup>30</sup> M. Polanyi, *Personal Knowledge. Towards a Post-Critical Philosophy*, Harper, New York 1962, p. 4.

<sup>31</sup> M.H. Zack, *Developing a Knowledge Strategy*, "California Management Review" 1999, No. 40.

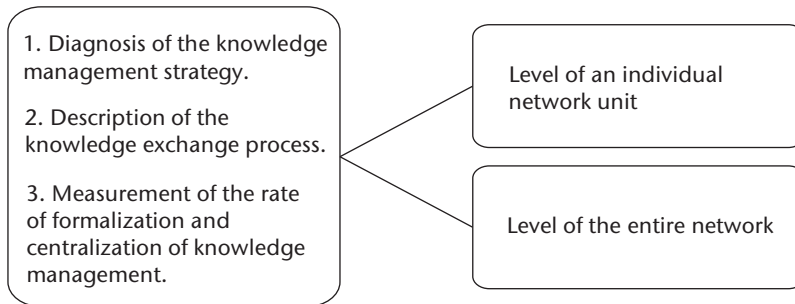
- a typology based on the purpose and method of use ('what' knowledge; 'why' knowledge; 'how' knowledge; 'who' knowledge)<sup>32</sup>;
- typology based on the character of knowledge (common and personal knowledge, physical and mental knowledge; static and dynamic knowledge, verbal and encoded knowledge)<sup>33</sup>.

All the processes enabling creation, dissemination and use of knowledge by a network organisation in order to reach specific targets, are defined as management. Appropriate knowledge resources management can significantly improve the competitiveness of a given network organisation.

### 3. Knowledge resources management at network organisations

Due to the specific character of the network structure, knowledge management at a network organisation is performed at two levels: the level of a single participant (unit) of a network; and the level of the entire network organisation. In both cases the knowledge management model covers: a diagnosis of the applied knowledge management strategy; a description of the knowledge exchange process; and a measurement of the level of formalisation and centralisation of knowledge management (figure 2).

Figure 2. Knowledge management model at network organisations



Source: own study.

Identification of the strategy applied by an individual network participant and by the entire network is the first element allowing for the diagnosis of the knowledge management model.

<sup>32</sup> B.A. Lundvall, B. Johnson, *The Learning Economy*, "Journal of Industry Studies" 1994, Vol. 1. No 2, pp. 23–42.

<sup>33</sup> F. Blackler, *Knowledge, Knowledge Work and Organizations: An Overview and Interpretation*, "Organization Studies" 1995, Vol. 16, No. 6, pp. 16–36.

An individual network participant can implement one of the four knowledge management strategies: the strategy of knowledge absorption, the strategy of knowledge transformation; the strategy of knowledge creation; or the strategy of knowledge accumulation (figure 3).

The knowledge absorption strategy consists in binding and absorbing the knowledge acquired from outside (from other units) for internal use.

The knowledge transformation strategy consists in processing and transferring to other network entities the knowledge acquired by a given unit from the outside.

The knowledge creation strategy consists in creating knowledge for external use by other network units.

The knowledge accumulation strategy consists in collecting the knowledge originated by a given unit for its internal use.

Figure 3. Knowledge management strategies at the level of an individual network participant

Source of knowledge	External	Knowledge absorption strategy	Knowledge transformation strategy
	Internal	Knowledge accumulation strategy	Knowledge creation strategy
		Internal	External
		Use of knowledge	

Source: own study.

It should be highlighted that a network unit can apply several knowledge management strategies simultaneously, since knowledge resources at its disposal are not homogeneous. Reasonable behaviour of a network unit requires the strategy to be adapted to a given category of knowledge resources.

In such a case, identification of knowledge management strategy applied at the level of an individual network participant, should be considered in the context of the knowledge type covered by this procedure. The result is a matrix of applied knowledge management strategies divided into specific categories of knowledge (Table 1).

Table 1. The matrix of knowledge management strategies applied by an individual network unit divided into categories of knowledge resources

Category of knowledge resources	Type of the applied knowledge management strategy				No. strategy
	Absorption strategy	Transformation strategy	Accumulation strategy	Creation strategy	
Concerning R&D					
... production processes					
... suppliers					
... competitors					
... customers					
... trade conditions					
... macro conditions					
Concerning...					

Source: own study.

Knowledge management at the level of an entire network organisation can take various forms. An entire network can implement one of the four knowledge management strategies: the strategy of subcontractor integration; the strategy of diversification; the strategy of transaction exchange; the strategy of experts' cooperation (figure 4).

Figure 4. Knowledge management strategies applied at the level of an entire network organisation

Network type	Dominated	Strategy of subcontractors integration	Strategy of diversification
	Equal partners	Strategy of experts' cooperation	Strategy of transaction exchange
		Specialised	General/universal
		Knowledge type	

Source: own study.

The choice of a specific knowledge management strategy at the level of an entire organisation depends mainly on the type of network (in particular the character of

interrelations and the level of participants' domination) and the type of knowledge subject to management.

Equal partners' networks apply the strategy of experts' cooperation or the strategy of transaction exchange. The strategy of experts' cooperation refers to a small scope of expert knowledge. It is based on mutual trust among those who have it. The strategy of transaction exchange refers to general (universal) exchange owned by individual partners. The basis of knowledge exchange are sale transactions.

At the same time dominated networks apply the strategy of subcontractors' integration or the strategy of diversification. The strategy of subcontractors' integration is applied at networks whose satellite units have expert knowledge and the network broker is willing to absorb it. In the diversification strategy the network broker looks for new applications for the universal knowledge it has.

A matrix of strategies of managing the knowledge obtained as a result of research for the entire network could be as follows (Table 2).

Table 2. The matrix of knowledge management strategies for the entire network unit divided into categories of knowledge resources

Category of knowledge resources	Type of the applied knowledge management strategy				
	Strategy of subcontractors' integration	Strategy of experts' cooperation	Strategy of transaction exchange	Strategy of diversification	No strategy
Concerning R&D					
... production processes					
... suppliers					
... competitors					
... customers					
... trade conditions					
... macro conditions					
Concerning...					

Source: own study.

A second element of identification of the knowledge management model at a network organisation is a description of the very process of knowledge exchange among network participants as well as between the network and its environment. Table 3 presents criteria describing the process of knowledge exchange.

The third and the last element identifying the knowledge management model at a network organisation is an assessment of the centralisation and formalisation process. In this case the analysis should be carried out both at the level of a single network unit and of the entire network.

Table 3. Criteria describing the process of knowledge exchange

Criteria describing the process of knowledge exchange	Possible options
Knowledge area to be exchanged	Knowledge on R&D works
	Knowledge on production processes
	Knowledge on suppliers
	Knowledge on competitors
	Knowledge on clients (customers)
	Knowledge on conditionings of the industry area
	Knowledge on economic macro conditions
	Other...
Payment for knowledge exchange	Exchange of each kind of knowledge is chargeable
	Exchange of unique and key knowledge is chargeable while the exchange of universal and insignificant knowledge is free of charge
	Exchange of each kind of knowledge is free of charge
	Difficult to say
Scope of knowledge exchange	Unlimited exchange of each kind of knowledge
	Limited exchange of selected kinds of knowledge
	No exchange between network participants
	Difficult to say
Character of knowledge exchange	Voluntary (depending on the network participants)
	Forced by the network initiator
	Difficult to say
Direction of knowledge flow between the network and the environment	Outward knowledge flow
	Inward knowledge flow
	Flow of knowledge in both directions
	Difficult to say
Knowledge flow within the network (among the network participants)	Knowledge flow from the network initiator towards other participants
	Knowledge flow from other network participants towards the network initiator
	Peer to peer exchange (any direction of exchange)
	Difficult to say

Source: own study.

## Recapitulation

The analysis presented above highlights the role of knowledge resources in the functioning of network organisations and the complexity of the knowledge management model. Identification of particular elements of this model makes it possible to assess the progress of knowledge management.

For an individual network unit three levels of knowledge management can be distinguished:

- Low – a unit has been appreciating knowledge resources for a short time, but it still does not have a knowledge management strategy or special software for this purpose;
- Medium – a unit is undergoing the process of creating a knowledge management system and collecting the necessary software;
- High – a unit has a fully integrated and complete knowledge management system supported by modern IT solutions making it possible to use knowledge in real time.

For an entire network, these levels refer to, respectively:

- low level – the network as a whole does not have a defined knowledge management strategy; there are no internally standardised IT systems;
- medium level – the network is creating a uniform knowledge management system; the existing IT solutions enable the network participants to access knowledge in deferred time;
- high level – there is a fully integrated knowledge management system in the entire network enabling its participants to access knowledge in real time.

## References

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## KNOWLEDGE MANAGEMENT AT NETWORK ORGANISATIONS

### Abstract

Knowledge resources play a specific role at a network organisation. They are both a trigger to create a network and a result of its functioning. Skilful knowledge management can contribute to the growth of a network's competitiveness. A diagnosis of the knowledge management model covers: an analysis of the applied knowledge management strategy; a description of the knowledge exchange process; and a measurement of the level of knowledge formalisation and centralisation. Identification of the knowledge management model should be carried out separately for the entire network and for each single network unit.

**KEY WORDS: NETWORK ORGANISATION, NETWORK, KNOWLEDGE, KNOWLEDGE RESOURCES, KNOWLEDGE MANAGEMENT, KNOWLEDGE MANAGEMENT STRATEGY, KNOWLEDGE EXCHANGE PROCESS**

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## ZARZĄDZANIE ZASOBAMI WIEDZY W ORGANIZACJACH SIECIOWYCH

### Streszczenie

Zasoby wiedzy pełnią szczególną rolę w organizacji sieciowej. Są zarówno motywem powstania sieci, jak i efektem jej funkcjonowania. Umiejętne zarządzanie zasobami wiedzy może przyczynić się do wzrostu konkurencyjności sieci. Diagnoza modelu zarządzania zasobami wiedzy obejmuje: analizę stosowanej strategii zarządzania wiedzą, opis procesu wymiany wiedzy oraz pomiar poziomu formalizacji i centralizacji zarządzania wiedzą. Identyfikacja modelu zarządzania zasobami wiedzy powinna być prowadzona odrębnie dla całej sieci oraz odrębnie dla pojedynczego ogniwa sieci.

**SŁOWA KLUCZOWE: ORGANIZACJA SIECIOWA, SIEĆ, WIEDZA, ZASOBY WIEDZY, ZARZĄDZANIE ZASOBAMI WIEDZY, STRATEGIA ZARZĄDZANIA WIEDZĄ, PROCES WYMIANY WIEDZY**