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AN ASSESSMENT OF A NETWORK APPROACH IN A PROJECT-BASED ORGANIZATION – A CASE STUDY OF A GLOBAL ENGINEERING SERVICE PROVIDER

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Abstract: This paper deals with the phenomenon of networks in operations research using the example of a selected organization. The main research objective is to analyse and evaluate the network implications in the sector of global design and engineering service providers. In the course of the research, one representative organization in the sector was subjected to research in accordance with the adopted methodology using structured questionnaires. After a literature review, a model of strategic analysis in a network approach was chosen as a starting point for preparing the methodology. The case study clearly showed that the company cannot be classified as a network organization according to the adopted methodology despite the noted network qualities. Therefore, it is legitimate to indicate severe contradictions in the three areas examined: environment, strategy and organization. Future research could be twofold: related to organizational structures and strategies evolution as well as the incubation of more accurate research methods.

Keywords: strategic management, strategic analysis, organizational network.

1. Introduction

The network phenomenon has been present in the literature on operations research since at least the beginning of the 20th century, and in management practice such solutions have been encountered for over 30 years. Numerous studies have dealt

with both elementary issues such as the network paradigm, and specific issues such as maturity levels of network structures, forming processes of a network structure, and practical analyses of enterprises in various sectors and industries. Many interesting studies explored the field of development strategies in respect of network features. Scholars concern themselves with the organizational structure, the value creation process, organizational relations, the business context, and opportunities and risk trends seen through the network lens. This is noticeable in many research works, including Niemczyk (2010) and Czakon (2012), who emphasize the need to systematize concepts and change the language. This shows how disordered, dynamic, and still developing this area of knowledge in operations research network structures is.

The networking (Castells, 2007) of the world and the globalization of economies which began at the end of the last century affect all aspects of life more and more. Subsequent changes occur increasingly more often and with greater intensity. It is widely believed that technology has caused the development of societies and economies fostering various types of networks. It would be more accurate to say that technology enabled such development as a kind of leverage for the flexibility of organizational structures, but nothing became reality until society started using it in a certain way. Castells (2007) rightly points out that it is society which is the driving force behind all changes in the fields of technology, development, and business. It was indeed the different reaction of societies (change of mentality) determined by a specific history, culture or state structures that set the tone for the changes. Technological changes, which in fact determine the way they function in many fields, depend on multiple factors with different weights and mutual influence. Thus it is interesting whether and how global organizations have really adapted to these changes, which, after all, determine the environment on various markets to a different extent. Are they flexible and continuously changing organizations as global management trend suggest? Are they feeding on multi-directional knowledge flow, cooperation, and synergy? How do they create value from the privileged position in the network as global players?

The aim of this paper is to analyse and assess the implication of network approach in the sector of global design and engineering service providers which is a natural environment for both project-based firms and project-based organizations (Manning, 2017). The main research problem is how this type of organizations can be examined in order to reach the objective. The author verified whether network research methods can serve the purpose. Therefore the research question for the paper is: can the project-based organization from the sector of global design and engineering service providers be understood as a network organization? How does the organization apply a network approach in order to build its competitive advantage?

The case study presented in the paper is expected to extend current knowledge in the theory-practice interface. The literature review shows the immensity of available studies related to networks in the field of operations research. Nonetheless,

case studies represent approximately 1% of research with the keywords ‘inter-organizational networks’ and ‘global engineering services’. The above confirms the need for further scientific exploration, which might lead to a revision of theories and give a new impetus to both researchers and business practitioners. In this paper, the author also carried out desk research, conducted an analysis of public-access documents of a selected company from the sector, and collected data from key senior manager of the company. A set of structured questionnaires were used to source the data.

The paper thanks to the complex nature of the investigation allows for assessing the network approach of the company to the possibly fullest extent. The outcome of the research will contribute to the global understanding of the network phenomenon, which in practice may differ from theoretical models.

2. Review of the literature on networks in operations

It has been argued that specific qualities can be identified as typical of network organizations, intra and inter-organizational networks. Based on studies that order the multitude of operative approaches, concepts, definitions and analyses¹, a set of qualities was selected based on the author’s subjective assessment as the most synthetic and comprehensive description of a network organization.

Networks can be observed, analysed, and understood on several levels:

- structures, i.e. components, dimension, configuration and density, coherence, position;
- functions, i.e. competences: including the ability to learn and create value, the ability to expand the fields of economic activity and geographic scope; relationships, range,
- life cycle, i.e. purpose and process of creation, management, and adaptation, decline and termination.

There are many definitions developed by researchers over the years, so only some from the last 20 years are reviewed below:

- Prahalad and Ramaswamy (2000; cf. Trzaska, 2017) – an organism created by the company, suppliers, partners and customers, in which everyone together creates value and competes for it (the so-called deepened network);
- Sydow (2002; cf. Trzaska, 2017) – a network of enterprises is an organized, polycentric form of economic activity, often strategically managed by one or several enterprises, striving to achieve a competitive advantage. It is expressed

¹ Zaheer, Gözübüyük, and Milanov (2010) propose an organizing framework based on theoretical mechanisms and levels of network analysis which helps navigate among existing studies. Czakon (2012) proposed a typology of networks according to selected criteria such as: position in value chain, level of orderliness, dominant coordination manner, purpose of creation, variability, volatility of environment, power, density, centralization, and geographical coverage. A bibliometric review of the terms related to the network can be found in (Trzaska, 2016).

in relatively stable, cooperative rather than competitive relations between legally independent, but economically at least dependent on each other;

- Delporte-Vermeiren, Vervest, and van Heck, (2004) – an inter-organizational network in business can also be a set of relations between the so-called focusing actor and the external actors dependent on it, working together on the implementation of a specific service for the client;
- Castells (2007) – a network enterprise emerges through the interaction between organizational crisis and change, and new information technologies, it is a special form of enterprise, the system of means (organization) which is created at the intersection of autonomous systems of goals;
- Falencikowski (2015) a network of enterprises is a grouping of at least three separate units connected with each other by relatively stable economic relations in order to create value for clients and for oneself.

There are certainly many more pertinent definitions of a network, which are generally similar despite their concentration, in some cases, on a selected aspect. In this paper the author decided to limit the number of the presented definitions to these referring to a project-based scheme. It is impossible to distinguish the most accurate definition due to the multitude of varieties of structures present in various economic systems, which means that there is no one universal classification of networks. For the purposes of further analyses, in this paper the most appropriate definition is the one pointing to an inter-organizational network as a set of relations between the so-called focusing actor and external actors dependent on him, working together on the implementation of a specific service for the client. An inter-organizational network is represented and equal to project-based organization network type for the purpose of this study.

The next step was to review the characteristics attributed to network organizations. These features are obviously directly related to the definitions formulated.

1. A structure consisting of at least three nodes (Czakoń, 2012; Falencikowski, 2015 among others) and the relations between them. Nodes are not departments, organizational units in the hierarchical sense, but actors (e.g. legal entities, key members of the organization).

2. Relations (ties) based on the lack of hierarchy, commitment, responsibility, reciprocity, and affiliation (Czakoń, 2012) as well as exchange and trust (Czakoń, 2005).

3. Autonomy (full or high) of units (nodes) in the network – many scholars mention this quality as characteristic, although it will be the most complete for inter-organizational networks. Often there will be full legal autonomy with some economic dependence in the case of an organizational or inter-organizational network where capital ties exist.

4. Low level of formalization – in the process of evolution from traditional to network organizations, the importance of replacing the hierarchy in the organizational system with a hierarchy of tasks (Niemczyk, 2015) or interdependence and cooperation (Czakoń, 2015a) was emphasized.

5. Flexibility – the ability to reconfigure provided by the variability of relationships, entities, goals, rules, duration, etc.

6. A common business goal – i.e. generating value for customers and network participants (Falencikowski, 2015).

7. Common management area – in the designated area the nodes coordinate mutual actions in the field of operative procedures, technology, infrastructure, resources, etc., that is the traditional interior of an organization (Pietruszka-Otryl, 2007, cf. Mikołajek-Gocejna, 2011).

8. Information flow – the repetitive nature of knowledge and information exchange between network entities.

9. Network effects – value created inside the network exceeds the sum of the value that can be generated by individual network nodes or by simply adding up the capacity of nodes and ties, e.g. five economic network rents according to Niemczyk (2015).

10. Time horizon – some researchers indicate that an expected longer period of the network functioning is characteristic (Czakon, 2012), others on the contrary indicate the periodicity of functioning and the disintegration of the network after achieving the goal (Niemczyk, 2015). The persistence of the network ‘despite’ and not ‘on purpose’ is supposed to be a symptom of network pathology, which, however, does not contradict the fact that such a pathological structure is still a network.

The above list is a limited set of the most characteristic, according to the author, qualities that broadly define network organizations. It is mostly related to structure, ways of (co-)operation, but the reasons for creating networks and their existence are also indicated. Obviously a common business goal and network effects are the core of everyone’s interest. Without this, the effort required to build the network and keep it operational and competitive (network cost) would be a sheer waste of resources. Therefore it should be assumed that each ongoing network structure brings rational benefits, mainly economic, to its participants.

3. Project-based organizations as a subject of research

Project-based organizations exist in a wide range of industries wherever highly specialized, unique, and limited expertise is required to deliver a project for a client. Such industries are, to name just a few, consulting services, culture and art, high-technology industry or complex products and systems (Sydow, Lindkvist, and DeFilippi, 2004).

The increasing interest in a knowledge-based economy, and the diverse network organizational forms result in numerous studies². Multitudinous case studies related

² Project-based organizations seem to be the field of operations research already quite well explored by researchers, including valuable, and highly interesting case studies. Nonetheless, network capabilities of a single organization that do co-create this type of structures is not so well represented

to diverse industries allow for an in-depth journey into “the world of project-based organizations” (Sydow et al., 2004). Networks are studied nearly everywhere from heavy industry to artisanry. Among them, one can distinguish (a) general studies focused on the phenomenon itself:

- theory (among others: Castells, 2007; Falencikowski, 2015; Mikołajek-Gocejna, 2011),
- typology (Czakon, 2012),
- business model (Czakon, 2015b; Falencikowski, 2015; Hedvall, Jagstedt, and Dubois, 2019; Niemczyk, 2016),
- formation (Cabral, 2015; Dodourova and Bevis, 2014; Jussila, Mainela, and Nätti, 2016; Manning, 2017; Mikołajek-Gocejna, 2011),
- structure (Manning, 2017).
- competitive advantage (Dodourova and Bevis, 2014; Leick, 2013),
- strategy (Czakon, 2012; Czakon, 2015a; Niemczyk, 2013; Niemczyk, 2015; Trzaska, 2017) etc.

and (b) detailed ones focused on specific aspects of the case, in particular, but not limited to:

- managerial practice (Foss, 2003),
- measurement of created value (Delparte-Vermeiren et al., 2004),
- knowledge management (Baark, 2002; Kloosterman, 2008; Larruscain, Río-Belver, Arraibi, and Garechana, 2017),
- cooperation (Dodourova, and Bevis, 2014; Skilton, 2011),
- cooperation strategies (Le Roy and Czakon, 2016; Yami, Castaldo, Dagnino, and Le Roy, 2010),
- dependence of informal relations and performance (Almadhoob, 2020)³,
- integration (Camposano and Smolander, 2019), and many more.

in the literature. A search of the database (scholar.google.com, dated September 2020) resulted in approximately 3 650 000 records for the phrase ‘project network organizations’, but only around 310 records for ‘project-based networks’. The number of studies related to project network organizations is still growing (around 38 300 positions in 2019, and 33 600 in first eight months of 2020). Probably this confirms the strong interest in this field of operations research.

³ Almadhoob (2020) analysed project-based self-organizing networks with the case study approach focused on The Bank Station Capacity Upgrade Project, an example of a case study of network in engineering services’ sector. A research analytical method (Social Network Analysis) was used to explore informal networks that emerge regardless contractual relations, and significantly contribute to project-based organization they arise from. SNA allows to work the thesis on micro, meso and macro-level analysis while not losing the global context thanks to the capacity to analyse the project environment. Almadhoob investigated a number of important qualities of a project-based organization’s network such as relations, actors, connectivity, influence, brokerage, type of roles, network density, tie strength etc. In parallel to SNA, multi-level decision-making and small-world network models as two other main quantitative methods were used. The above-mentioned quantitative methods resulted in substantial information which were combined with qualitative data gathered mainly from project-related documents.

Manning (2017) investigated the formation of project network organizations as the structure succeeding after project-based firms. This study highlights the importance of project-based firms in initiating and managing the emerged network, but also what is perhaps less obvious fostering its performance by proper coordination and maintaining the core of project network organizations as well as partnership

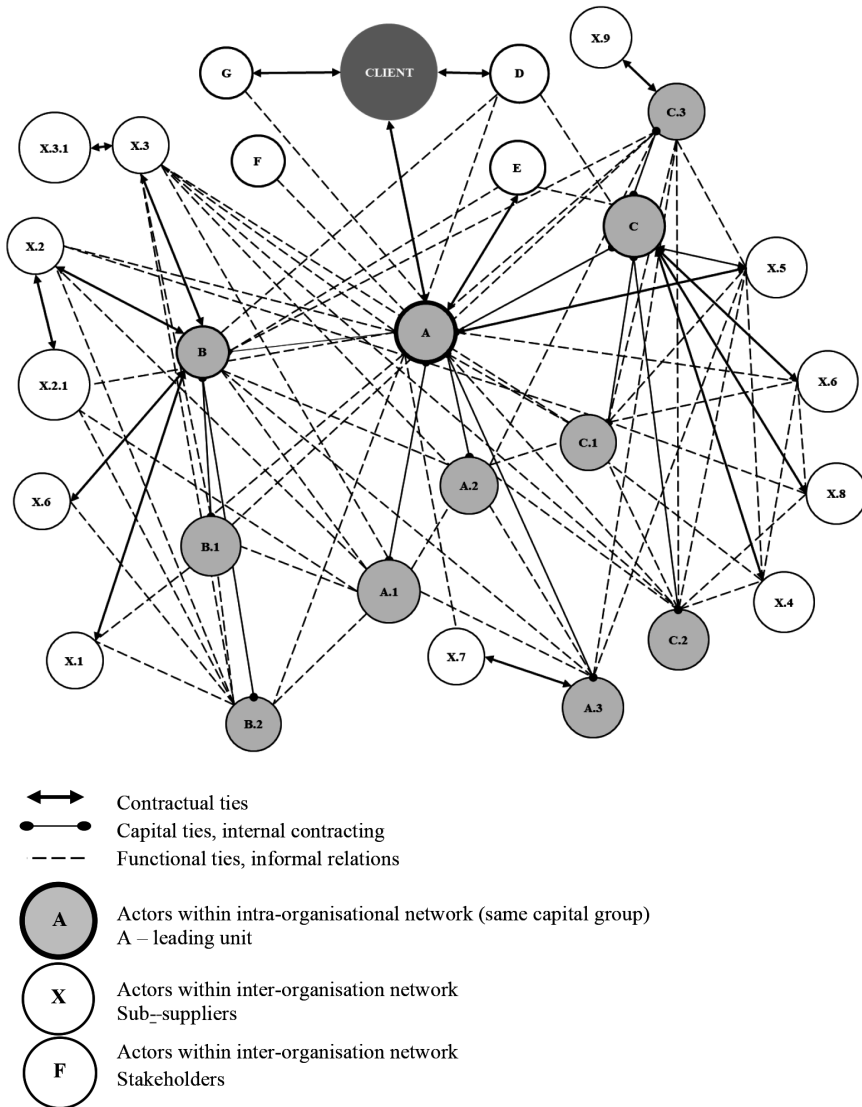


Fig. 1. Network of the project-based organization

Source: own elaboration.

relations⁴. The findings i.e. the identified core features, antecedents and differentiating properties of project-based networks extend the understanding of the coordination and interplay of project-based firms, networks and project entrepreneurship. It has been argued that the coordination capacity of the network, and thus its efficiency, depends on project-based firms' ability to take strategic coordination roles. The author believes after Manning (2017) that the nature of the key actor in the network must be investigated to enable understanding the phenomenon. For this reason, the network analysis of a carefully selected organization is the theme of this paper. Global engineering is a sector where networks naturally emerge as the only possibility to answer needs of the market. The key actors in the sector are those who initiate, form, and manage project-based organizations. This paper will contribute to project-based organization studies by investigating one of the key players of global engineering services. A simplified scheme of the project-based network structure with internal connections of different types is presented below in Figure 1.

4. Selected research methods of networks in strategic management

This section aims to present some research methods based on selected publications quoted in the previous section. This self-limitation is a necessary consequence of the decision to focus on structure and strategy.

Manning (2017) concentrated on an empirical review and comparative study with a multi-level perspective of various project businesses across different fields, namely film and TV production, event organizing, complex product and system development (e.g. telecom exchanges, aircraft engines and ships, high-speed trains etc.), collaborative research and innovation, and international development (e.g. sustainability, poverty alleviation, economic development, education etc.). The fields of the research were selected based on certain criteria such as project-based character, inter-organizational specialization of actors, and long-term project-based networks and relations. Inevitably some differences between organizations were identified, measured, and compared in detail.

Trzaska (2017) based his analysis of network features on the assumption of undeniable added value creation within each operating network. The added value is a source of an economic rent, broadly speaking a surplus which allows building competitive advantage and generate profit. In the process of building a strategic analysis model in the network approach Trzaska (2017) initially listed 164 basic network features organized in three categories: general network characteristics,

⁴ Interesting contradictions present in the nature of project-based organization can be noted and investigated. Sydov et al. (2004) highlighted tensions between project management theory and practice of the one-off nature of such organization. Some scientists spoke of the clash of autonomy need which is one of the network's main characteristics, and the embeddedness in more permanent structures (Manning, 2017; Sydov et al., 2004). Manning (2017) mentioned the need for the right balance between key areas i.e. formal-informal, local-global, etc.

relations (ties), and nodes. As a result of four iterations according to his original methodology with the participation of recognized experts in the field, Trzaska (2017) compiled a final list of 54 network features. These were the basis for the search of correlation between the features and the economic rent. Then proprietary questionnaires were developed as a tool for the network analysis of an organization.

The logic of economic rents (Niemczyk, 2013) is based on the ingenious simplicity of the statement that “theoretical explanation of efficiency increase” must be confirmed in a practical and real ‘source of surplus’. This concept undoubtedly constitutes a bridge between the scientific theories and business practice, which is constantly looking for new ways to develop, increase efficiency and foster economic growth. Niemczyk (2013) defines five types of network economic rents:

1. Appropriation – a rent representing the lowest level of network organizations on the proposed development scale. It consists in the passive takeover of the values created by other network participants thanks to existing relationships in the network. Values such as knowledge, brand or tangible assets generated under the contract, e.g. due to cost arbitration, may be appropriated. According to the author’s concept, this rent does not exist in a highly developed network as a kind of parasitic relationship. It can be assumed that the surpluses generated by appropriation are replaced in more mature organizations by the network effect which, by definition, derives the most from the existence of network.

2. Williamson’s rent – based on Williamson’s transaction cost theory. It can be understood and used in practice as simple cost optimization solutions in a form of classic outsourcing. At the other end of the scale, there is an organization that functions in complex cooperative systems, where Williamson’s theory was creatively supplemented with Gibbons’ concepts of relational contracts and their benefits. Between these two extremes there are several indirect forms such as strategic outsourcing and complex networks optimized around contracts.

3. Network value rent – as distinct from simple linear value chain this rent specifies the benefits of more complex configurations such as the interpenetration of horizontal and vertical networks, systems in which a given member participates in various chains also acting as a diverse function element. Examples of solutions defining individual levels of network development include systems from a single value chain, through a network of more than one chain, a system based on company-client interaction, as well as between at least two stakeholders, up to a system including all contract stakeholders.

4. Knowledge diffusion rent – based on the basic concept of knowledge diffusion, which obviously is nothing new in the era of organizational networks. On the other hand, the author of the concept indicates that natural complexity of network systems enriched with known system theory or complexity science, opens up new possibilities for research on abilities to generate added value within the process of knowledge diffusion.

5. Network effect rent – occurs when the entire network as a whole, and each of its members benefit in the wake of connecting a new member. The highest form of economic rent of this kind is a new organization which emerged as a result of complex operation of the network.

To obtain possibly the most complete picture of an analysed organization, Trzaska (2017) defined a set of questions organized in three questionnaires dedicated to the company's strategy and its business environment. The research then was focused on three key areas that determine any business, i.e. its context, strategy, and structure. The intention of Trzaska (2017) was the creation of a generic tool for network approach assessment for any organization. In this paper the research method developed by Trzaska (2017) was used to analyse and assess network approach of the selected organization.

Other widely used research methods, also in combination with other complementary methods, are desk research (Almadhoob, 2020; Foss, 2003; Skilton, 2011), focused interviews (Jussila, Mainela, and Näti, 2016; Leick, 2013), qualitative inductive approach with semi-structure open-ended interview (Dodourova and Bevis, 2014), simulation (Cabral, 2015), and many more.

5. A network analysis of the project-based organization

5.1. Research method. Adapting the selected tools to the company specificity

In order to reach the main research goal, a specific procedure was outlined according to the following stages:

Stage 1. Identification of network organization qualities based on literature review. Research tools identification.

Stage 2. Selection of organization meeting certain criteria in accordance with the formulated problem and research goal.

Stage 3. Adapting selected research tools to the specificity of the selected company.

Stage 4. Identification of the organization's network features according to the adopted methodology:

- Step 4.1. Assessment of the company's network nature.
- Step 4.2. Assessment of the company's network strategy.
- Step 4.3. Assessment of the company's business context.

Stage 5. Analysis of the results.

Stage 6. Conclusion and discussion.

The diagram of the procedure is presented below – Figure 2.

Due to the specificity of the selected company and the market sector, it was decided to make certain modifications and additions to the selected research tool. In the author's opinion these changes should contribute to a more complete picture of the surveyed organization and thus increase value of the research, which is discussed in more detail below.

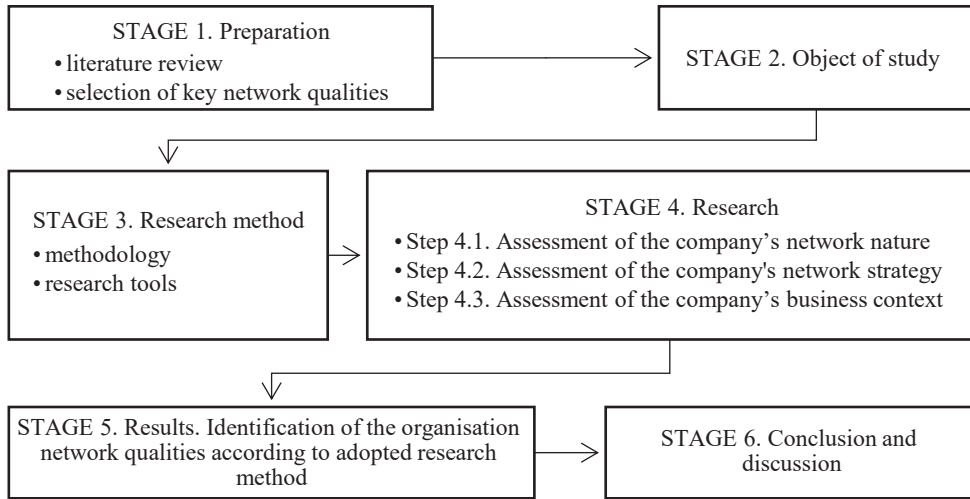


Fig. 2. Diagram of the research procedure

Source: own elaboration.

Originally the research tool consisted of three structured survey questionnaires, one for each key area of organization: strategy, environment, and company itself. The possible answers to every question were “yes”, “no”, “no idea”. Each answer resulted in a score equal to 3 for “yes”, 2 for “no idea”, and 1 for “no”. The average score was calculated for each of the questionnaires to assess the company in a certain area.

Step 4.1. Assessment of the company’s network nature

The questionnaire for assessment of the company’s network nature in its original form contained only three questions while the methodology is based on five economic network rents (Niemczyk, 2015). Using the questionnaire unchanged would likely result in a general statement about the probable network nature of the company and would make it impossible to understand in more detail how the company is using economical rent. The author is convinced about the need for more in-depth research as even public-access information about the size and structure of the company, geographical coverage, key bidder position in public tenders (also as part of joint venture) only confirms its general network nature.

The original questionnaire was modified and supplemented based on the network maturity level and the network rent matrix (Niemczyk, 2015). Step 4.1 of the research runs in two phases using two developed questionnaires:

- 1) the first consists of 12 questions organized in four areas related to four economic rents present in maturity levels from first up to third, i.e. appropriation rent, Williamson’s rent, network value rent, and knowledge diffusion rent;

2) the second focuses on four economic rents present in maturity levels from fourth up to fifth, i.e. Williamson's rent, network value rent, knowledge diffusion rent, and network effect rent in 12 questions.

To complement these, a final column for comments was added to minimize the risk of a situation where the respondent, due to the complexity of the topic, marks the least desired answer "no idea".

The average of the answers in phase 1 allows to classify the company as an organization with network qualities (mean ≥ 2.5), or without these (mean < 2.5).

Phase 2 takes place only if the company reaches the score ≥ 2.5 in phase 1. The average of the answers in phase 2 qualifies the company as an entity with a high level of network maturity (average ≥ 2.5), medium level of network maturity ($1 < \text{average} < 2.5$) or a low level of network maturity (average ≤ 1).

Step 4.2. Assessment of the company's strategy, and Step 4.3. Assessment of the company's business environment

The questionnaire for the company's strategy assessment, taking into account the network approach, was left unchanged as in the source study by Trzaska (2017). In the author's opinion, the originally formulated questions accurately address important elements of the strategy and do not require substantive modifications. The list of questions formulated in this way seems to be a universal research tool, relevant both for this study and for the selected company. The questionnaire for the company's environment assessment, also considering the business ecosystems theory, remained also unchanged as in the source study (Trzaska, 2017).

Both steps were carried out according to the original methodology. Analogically to the preceding step, the questionnaires were supplemented with a column for comments. An average result in step 4.2. ≥ 2.5 is tantamount to the statement that the company has a strategy with at least network approach elements. An average result in step 4.3 ≥ 2.5 is tantamount to the statement that the company operates actively with the network environment. Consequently, a result < 2.5 is synonymous with the assessment of whether the company operates in a low variability environment or is rather inactive in the network environment.

The answers to all the questionnaires should be obtained from a person in the organization who has the fullest possible knowledge of its functioning, however it is permitted to use public-access sources for steps 4.2 and 4.3 when necessary.

5.2. The results. Identification of the features of organization network according to the adopted research method (assessment of the environment, of network strategy, and of network nature)

Step 4.1. Assessment of the company's network nature

The study of the company's network nature was carried out in two phases in accordance with the methodology. An examination of the received responses did not show any

major differences between the results for both phases (Figure 3.). The highest score of 2.3 in phase 1 was obtained in three economic rent areas: appropriation, knowledge diffusion, and network value. A relatively low result (1.7) can be noticed in the area of Williamson’s rent, which is also confirmed by the respondent’s comment about the lack of sufficient interest of the company in cost optimization. The result in phase 1 averages at 2.17 and according to the methodology the company should be classified as an organization without network qualities.

Since the respondent also answered the questions from the questionnaire for phase 2, these results were also analysed. The result of the phase 2 was also well below 2.5 – averaging at 2.25. A comparable result (2.3) was recorded in three economic rent areas: transaction costs, network effect and knowledge diffusion. The value creation rent showed a slightly lower score (2.0) in the study (Figure 3).

In view of the above, the average score for all the responses in this step was also calculated. It amounts to 2.21, which confirms the correctness of the result and classification as per phase 1 (Figure 4).

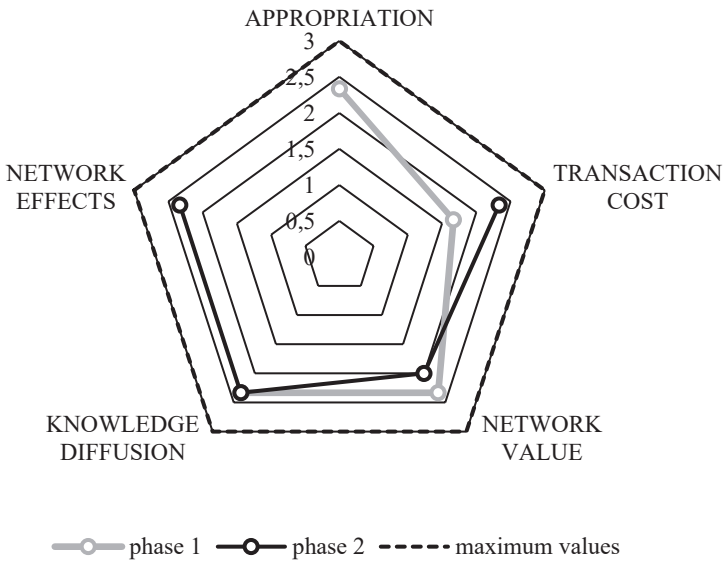


Fig. 3. Distribution of network economical rents per phase

Source: own elaboration.

It is worth noting that a quarter of the answers received during phase 2 was “no idea” (Table 1). This does not affect the result itself as the assessment was based on phase 2, but it should be discussed in the conclusion.

Step 4.2. Assessment of the company’s network strategy

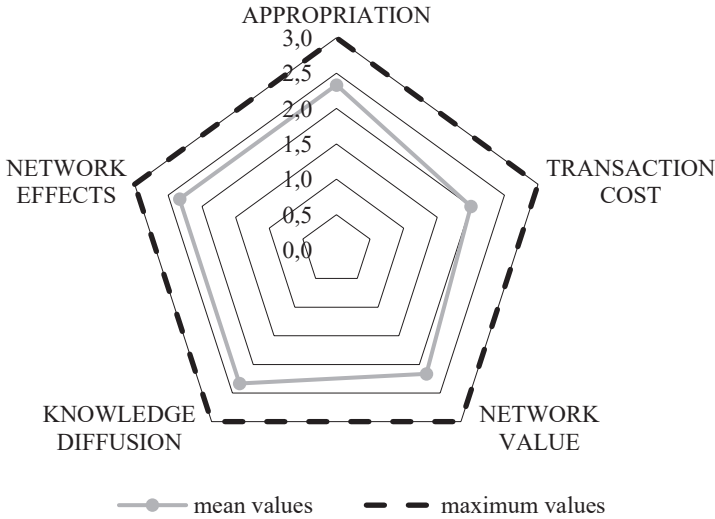


Fig. 4. Distribution of network economical rents

Source: own elaboration.

The results of step 4.2 shown below (Table 1) allow for an unequivocal assessment. Ten out of the twelve answers were positive, which resulted in an average score 2.67. The object of the study has a strategy based on the network approach.

Table 1. Results – structure of responses

Step of the analysis	Yes	No idea	No	Result mean values		Yes	No idea	No
4.1. Company’s network nature assessment – phase 1	7	0	5	2.17	< 2.5	58%	0%	42%
4.1. Company’s network nature assessment – phase 2	6	3	3	2.25	< 2.5	50%	25%	25%
4.2. Company’s network strategy assessment	10	0	2	2.67	>= 2.5	83%	0%	17%
4.3. Company’s business environment assessment	11	1	3	2.53	>= 2.5	73%	7%	20%

Source: own elaboration.

For the record, only two questions were responded to negatively: does the company’s competitive advantage depend on the structure of the business environment? Are the business environmental conditions stabilized by relationships

with competitors or by mediation skills? Both questions refer to a business environment, which according to the respondent does not qualify the company's advantage, and which is not (cannot be?) stabilized by relations. No neutral answer was noted.

Step 4.3. Assessment of the company's business environment

The business environment assessment confirms that the company operates actively in a networked environment. As demonstrated below in Table 1, 73% of answers were positive, one response was vague, and three were negative. The average score amounted to 2.53 which is above the quantitative threshold of 2.5.

6. Conclusion and discussion

This study used one of network methods to investigate and understand the network nature of a project-based organization. The main assumption of the paper which influenced selection of both the object of the study and the research method and tools, was the idea of network economic rent i.e. a positive correlation between the network approach and the creation of added value (Niemczyk, 2015; Trzaska, 2017).

The research yielded interesting results. Major discrepancies in three key management areas were noted. The organization was assessed as an entity without network qualities, while having a network strategy, and operating actively in a dynamic network business environment. Based on the above one can draw the conclusion that the organization is either in the process of change or has found the right balance between a full network model and a traditional resource-based view. Undeniably the company responds to the business environment with the appropriate strategy. At the same time, as confirmed by the respondent's comments, they apparently face barriers to being transformed into network organization. It is worth highlighting that the research is based on respondent opinion, not facts and refers to a specific organization. Nonetheless, the conclusions can be used as a starting point for further research.

The situation where the structure is out of step and does not (yet?) keep up with the strategy is the case here. The structure-strategy relationship is a topic that has been explored by scientists since at least the 1960s. Traditionally, they pointed to the logic of enterprise development shaped by decision-makers (owners, shareholders, management) according to the scheme of usually three stages of development. Over time, it was observed that the development model should be expanded by a fourth level, in which phase the organization becomes a supranational corporation with a complex matrix or network structure (Machaczka, 2001). It seems that the classic view that managers are in control of organizational development is oversimplified and has been replaced over time. In recent years, and one should go back to at least 2000, the literature places strong emphasis on the importance of the environment as a strong determinant of the strategy and organizational structure.

While collecting the answers, some informal and unstructured interviews took place. This element was not part of the methodology, so it was not taken into account as irrelevant for the paper. Nevertheless, it showed that the idea of networking and the free flow of information evokes varied emotions at all levels of the organization. According to the respondent, the biggest fans of network solutions are specialists, experts in various technical fields, and engineers. A reluctant attitude towards network transformation is most often presented by middle-level managers, i.e. those who are responsible for daily operations, and in the case of organizational changes, for the effective implementation of new practices, while respecting all standards of timeliness, quality, ensuring confidentiality, etc. Therefore, their resistance to change is apparent as change usually requires an increased effort, destroys the current order, and can potentially cause a performance decrease, at least temporarily. Such a picture of the organization where the top management sees and understands the network environment and draws a corresponding strategy, the staff is positive about the new, and the mid-level management is the 'brake', is quite interesting and seems worthy of further observation. The question is how organizations will change, as the very fact of the ongoing change is certain. Will the lower levels of the organization be a natural catalyst for change and an ally of the top management's strategy? It seems that in view of the prevailing swing towards a network solution, the middle level will have to adapt. However, it is necessary to provide them with knowledge and tools, and above all, a vision of the future, so that they will become ambassadors of the transformation⁵.

The aim of this study was to analyse and assess the use of network approach in the selected organization from the sector of global design and engineering service providers. The main goal was achieved, and the diagnosis brought quite surprising results. One can risk the statement that the degree of network maturity is significant since both the strategy and operational activities have network qualities, and the business context in which the organization operates is a network environment. Therefore, it is legitimate to find a contradiction in the three examined areas, i.e. the environment, strategy, and structure. The author veers towards the claim by Falencikowski (2015) that "it is possible for a network of enterprises to operate according to its own, specific business model." Certainly, the researched company

⁵ Nearly 20 years ago, Bartlett and Ghoshal (2002) noticed that strategies must be built on a foundation of human resources. For most organizations, the times of drawing strategies were based solely on the analysis of trends, models, etc., without the human as a starting point are gone. Today, for companies that build value based on knowledge, this statement has never been truer. Perhaps the image of the inevitable volatility of business reality and the needs of the third millennium employees hardly restrained by the traditional 20th century's operational management, is a good paraphrase of the statement by Bartlett and Ghoshal (2002), who said that "today's managers are trying to implement third generation strategies through second-generation management". This state of internal contradiction is certainly temporary, as an important condition of building and maintaining an advantage on the market is the consistency between the strategy and managerial practices.

is at some intermediate stage of network maturity, which is possibly a result of business environment challenges, organizational possibilities, and economic logic of its operations. It is probable that the pursuit of a more complete or classical (although there is no such canon) network model is irrational, economically unjustified and would risk the development of organizational pathologies.

Certain limitations of the research also must be highlighted. It cannot be ruled out that the methodology, including the adopted tools, might not be appropriate, for example due to the point source of some data i.e. the subjective responses of the respondent. The risk of distorted results due to a misunderstanding, insufficient knowledge, or other cognitive limitations, and even a desire to “improve” one’s own organization’s score was not excluded⁶. Such interferences could be eliminated with a more objective source of data, e.g. a set of calculable indicators which should be global and universal enough to be calculated for various organizations, and at the same time specific and detailed to measure certain qualities of the subject under study. According to the author’s knowledge such a set of indicators does not exist and its development seems worth the research effort.

The development of networking in a very broad sense is essentially irreversible, so organizations operating in such a world cannot ignore this fact, as long as they want to survive. It will be interesting to observe the direction in which these changes will go. However, an observation will give a true picture only when using the right tools. Further research on organizational structures and the evolution of strategies is fascinating, possibly extended by a sociological perspective, which was also indicated in the paper pointing to a well-described and known relationship between the effectiveness of an organization and the use of the resources at its disposal, in particular human resources. Another topic worthy of interest could be an interface between the effectiveness of the network and the network qualities of its key actors.

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⁶ In the analytical part, the structure of responses and additional comments of the respondent were also examined to capture such undesirable phenomena. In particular, in step 4.1 the assessment of the company’s network nature, a significant share of “no idea” responses and additional comments were noted, which indicated the difficulty in providing an unambiguous answer.

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OCENA SIECIOWOŚCI ORGANIZACJI O STRUKTURZE KONTRAKTOWEJ – STUDIUM PRZYPADKU GLOBALNEGO DOSTAWCY USŁUG INŻYNIERYJNYCH

Streszczenie: W artykule omówiono zjawisko sieci w naukach o zarządzaniu i jakości na przykładzie wybranej organizacji. Celem badawczym była analiza i ocena podejścia sieciowego w sektorze globalnych dostawców usług projektowych i inżynierskich. W toku badań jedna reprezentatywna organizacja została poddana badaniu zgodnie z przyjętą metodologią z wykorzystaniem ustrukturyzowanych kwestionariuszy. Wykorzystując przegląd literatury, za punkt wyjścia do przygotowania metodologii wybrano model analizy strategicznej w podejściu sieciowym. Studium przypadku jednoznacznie wykazało, że organizacji nie można zakwalifikować jako sieciowej zgodnie z przyjętą metodyką mimo odnotowania cech sieciowych. Zatem uzasadnione jest stwierdzenie poważnych sprzeczności w trzech badanych obszarach: otoczeniu, strategii i organizacji. Przyszłe kierunki badań mogą wyznaczać zarówno dalszy rozwój struktur sieciowych organizacji i ich strategii, jak i poszukiwanie odpowiednich metod i narzędzi badawczych.

Słowa kluczowe: zarządzanie strategiczne, analiza strategiczna, sieci organizacyjne.