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Public Network Models: A Typology Based on a Systematic Literature Review

Modele sieci publicznych – typologia oparta na systematycznym przeglądzie literatury

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ABSTRACT

Objective: The article develops, based on a systematic literature review (SLR), a typology of public network models. It interprets the concept and specificity of a public network. Finally, it reviews the typology of organisational network models and indicates the directions for further research.

Research Design & Methods: The methodology of systematic literature review was used, supplemented by snowball sampling. To obtain data, the Scopus and Web of Science (WoS) scientific databases were analysed. The results were then synthesised to develop a typology for public networks. Typological analysis was used in addition to SLR and snowball sampling.

Findings: As a result of a systematic review of the literature, a typology of public network models was reviewed and a typology proposed. The theoretical function of the typology is an indication of trends in the development of public network models, while its practical function is as a tool for further analysis.

Implications/Recommendations: The analysis shows that public networks differ from other networks, such as business networks. The breakdown of public network models is multi-layered

and may include various criteria. The typology developed for the paper covers four types of public networks: global public networks, networks of public organisations, local government networks, and partnerships.

Contribution: The issues discussed in the paper fill the research and methodological gap in research on public networks. This gap is a stark lack of theory and conceptualisation in studying such networks. The paper defines the role of the network approach as an emerging paradigm in the management of the public sphere, and that is its main contribution.

Article type: original article.

Keywords: public networks, typology, systematic literature review (SLR), inter-organisational networks.

JEL Classification: L3, L14.

STRESZCZENIE

Cel: Celem artykułu jest opracowanie – na podstawie systematycznego przeglądu literatury (SLR) – propozycji typologii modeli sieci publicznych. Dokonano interpretacji pojęcia sieci publicznej i określenia jej specyfiki, a także przeglądu typologii modeli sieci organizacyjnych. Wskazano również kierunki dalszych badań.

Metodyka badań: Wykorzystano metodykę systematycznego przeglądu literatury, uzupełnionego metodą „kuli śnieżnej”. SLR zastosowany został w celu głębszego zrozumienia badanego zjawiska, a także przedstawienia zaleceń dotyczących dalszych badań. Jako źródła danych wybrano bazy Scopus i Web of Science (WoS). Dokonano syntezy analizowanych wyników w celu opracowania typologii sieci publicznych. Oprócz SLR główną metodą badawczą była metoda typologii (analiza typologiczna).

Wyniki badań: Na podstawie systematycznego przeglądu literatury dokonano przeglądu typologii modeli sieci publicznych oraz zaproponowano własną typologię. Pełni ona zarówno funkcję teoretyczną poprzez wskazanie trendów rozwoju modeli sieci publicznych, jak i praktyczną, stanowiąc narzędzie do kolejnych analiz. Wskazano także kierunki dalszych badań.

Wnioski: Z przedstawionych rozważań wynika, że sieci publiczne mają swoją specyfikę i znacząco różnią się od innych rodzajów sieci, np. sieci biznesowych. Podział modeli sieci publicznych jest wielopoziomowy i może obejmować różne kryteria. Opracowana typologia obejmuje cztery rodzaje sieci publicznych: globalne sieci publiczne, sieci organizacji publicznych, sieci samorządowe oraz partnerstwa.

Wkład w rozwój dyscypliny: Podjęta problematyka wypełnia lukę badawczą i metodologiczną w badaniach nad sieciami publicznymi. Obecnie luka ta stanowi poważny niedostatek teorii konsensusu i konceptualizacji w badaniach takich sieci. Wkład w rozwój dyscypliny nauki o zarządzaniu i jakości polega na określeniu roli podejścia sieciowego jako wyłaniającego się paradygmatu w zarządzaniu sferą publiczną.

Typ artykułu: oryginalny artykuł naukowy.

Słowa kluczowe: sieci publiczne, typologia, systematyczny przegląd literatury (SLR), sieci międzyorganizacyjne.

1. Introduction

There has been a noticeable shift in recent years in how public utility service organisations are managed (Mountford 2019, Whitford *et al.* 2020). As public managers face new challenges, they must search for solutions to organise the operations of these entities to best serve society's needs. The increasing professionalisation of public organisation management and the search for new ways to provide public services has led to a greater emphasis on cooperation between public organisations (Provan & Milward 2001, Ha, Lee & Feiock 2016). Inter-organisational partnerships are becoming more prevalent in the provision of public services, and terms such as “inter-organisational relations”, “cooperation-oriented networks”, and “inter-organisational networks” are commonly used in public management literature (Austen 2014, Kruckenberg 2015, Ujwary-Gil 2017, van den Oord *et al.* 2020). This trend is exemplified by the growing interest in network concepts in the field of public management.

Today's public organisations have to cope with the increasingly significant changes in society. This means they must provide services under new conditions and according to different rules. Increasing changes in the demographic structure of the population, the democratisation of public life, and the growing pressure for ever greater participation of public and social sphere entities in meeting society's needs mean that there is increasing pressure to professionalise the governance of public organisations (van den Oord *et al.* 2020, Whitford *et al.* 2020).

This article examines public networks, which are the focus of governance and comprise organisations from different sectors to undertake activities to achieve public benefits. These networks usually go beyond a single sector, involve multiple levels of governance and address a specific policy area or a specific problem (Ha, Lee & Feiock 2016, Ford & Yoho 2020). My main motivation for researching public networks is the current and serious shortage of consensus theory and conceptualisation in studying such networks.

Employing a systematic literature review, the article develops a typology of public network models. An essential premise for taking up this topic is that the network approach can be treated as a new emerging paradigm in public sphere governance.

Given the existing cognitive and methodological gap, this paper presents an overview of proposals for typologies of public network models in the literature and develops a proprietary taxonomy of public network models. It develops a proprietary typology of public network models. It also pursues the following auxiliary objectives:

- interpret the concept of a public network and define its specifics,
- review the typologies of organisational network models,
- provide my own typology of organisational network models,

– evaluate organisational network models and indicate the directions of their development.

Thus, the main research problem is understanding the types of public network models that are used. This will be achieved by reviewing the typology of public networks described in the literature. First, the specifics of public networks are defined, and then public network models and their typologies are reviewed. My own typology of public network models serves both a theoretical function (by indicating trends in the development of public network models) and a practical function (providing a tool for further analysis).

2. The Specifics of Public Networks – a Literature Review

Governance of public services has become one of the most critical domains of the state. The change in the approach to the governance of public service organisations poses new challenges for decision-makers. This has prompted a need to seek solutions for organising the operation of public service providers that will best allow them to meet society's needs. Given the need to increase the professionalisation of the management of public organisations and to provide public services more efficiently, the importance of how and to what extent public organisations interact is being increasingly emphasised. Analysis of operating practice reveals that public services are drawing on inter-organisational partnerships more widely, while in the literature on governance, one finds such terms as “inter-organisational relations”, “cooperation-oriented networks”, “inter-organisational networks” (Akkerman, Torenvlied & Schalk 2012, Feiock, Lee & Park 2012, Kapucu & Garayev 2013, Austen 2014, 2018). Rising interest in the concept of networks for governance clearly manifests the trend. It also helps illustrate the search for ways to more efficiently carry out the tasks set before the state and the organisations through which it performs its tasks (Austen 2014).

Public networks are the focus of governance and are defined as those networks that include organisations from different sectors to undertake activities to achieve public benefits (Herranz 2009). These networks usually go beyond a single sector, involve multiple levels of governance, and address a specific policy area or problem (Provan & Kenis 2008). The literature on the concept of networks as applied to public management reveals that it can be applied in domains including health-care (Provan & Milward 1995), crisis management (McGuire & Silvia 2009), environmental protection (Klijn, Steijn & Edelenbos 2010), education (Sandström & Carlsson 2008) and social services (Chen 2010).

Public networks are often defined as interdependent structures containing multiple organisations or parts of organisations, where one entity is not formally subordinate to another. Networks manifest a kind of structural stability; however, they go beyond formally established links and politically sanctioned ties. The insti-

tutional bond may stem from power dynamics, relationships characterised by mutual exchange, and alliances formed around shared interests. Other approaches hold that networks of public organisations are agreements between organisations directed at solving problems that cannot be easily or entirely solved by individual organisations. These networks include formal and informal structures consisting of representatives of government and non-government agencies working inter-dependently to exchange information and/or jointly formulate and implement policies. Similarly, Herranz (2009) states that public networks include non-profit organisations that seek to achieve public interest goals. Public networks can also be described by their characteristics, which stems from interpreting the network in the language of resources. In this context, it can be assumed that (*Sieci międzyorganizacyjne...* 2012):

- a public network is formed by relationships between at least two independent (in the legal, organisational, and economic sense) entities; one of these entities is a body governed by public law;
- entities cooperate for the good of the public (this does not exclude the possibility of profit being generated by the private entity);
- the network is a space for organisational learning; there is a gradual replacement of “individual” rationality with “collective” rationality, which is a function of the mutual adjustment of network participants (this is difficult but essential to public-private entity relationships);
- the purpose of cooperation between these entities is to generate a relational rent.

Public networks are unique in that they consist of non-profit organisations whose goal is the public interest. Additional legal, procedural and political relationships play an important role in public networks, which can limit their ability to operate flexibly. For the purposes of this article, public networks are understood as mutually dependent public, social or commercial organisations that undertake joint activities for the implementation of the public interest.

Public networks are distinguished from private networks in the following ways (*Sieci międzyorganizacyjne...* 2012):

- the purpose of interaction (realisation of public interest vs. of individual interest),
- relational rent (source of efficiency vs. source of competitive advantage),
- effects of cooperation (difficult to vs. easy to define),
- horizon of cooperation (long-term vs. medium-term or short-term),
- objectives of relationship actors (more difficult vs. relatively easy to reconcile).

Further legal, procedural and political relationships are present in many definitions of public networks (Herranz 2009). It is fair to say that public networks are

mutually dependent on public, social and commercial organisations that undertake joint activities to implement the public interest.

3. Methodology

A systematic literature review (SLR) was used to achieve the aims of this paper. As a secondary source of knowledge, SLR is beneficial in three ways: it makes it possible to control a large amount of emerging scientific information; it identifies research gaps; it helps to analyse the phenomena under consideration and to develop further research directions (Forouharfar, Rowshan & Salarzahi 2019). According to Kitchenham and Charters' approach (2007), SLR is implemented in three stages:

- 1) research planning (including formulation of research questions),
- 2) conducting analyses (including deciding the criteria by which the literature will be collected),
- 3) reporting.

For the research done for this paper, the following process was employed: First, pose research questions and develop appropriate criteria for collecting the literature. Second, develop a plan to classify, describe and code the literature by filtering it. Third, synthesise the literature.

The Scopus and Web of Science (WoS) databases were analysed to obtain data. Containing the full texts of articles and citations of articles published in the most widely-read journals, these databases enabled us to provide complete information on network approaches in the public sector.

Three keywords constituting a string of searches in databases were chosen:

- 1) organisational network,
- 2) public sector,
- 3) public.

Additional exclusion criteria were also applied to reject articles referring to the term *intraorganisational networks*.

The following research string was defined, according to the suggested Boolean operators for "advanced search":

"organisational network*" AND ("public" OR "public sector")
AND NOT "intraorganisational network*"

In accordance with the research functionalities of the databases, selected keywords were searched in "Topic" (including Title, Author Keywords, Abstract, Keyword Plus®) in WoS and in "Title, Author Keywords, Abstract" in Scopus. To improve the rigor and quality of the literature review, the search was limited to journal articles, as recommended by Vigolo, Sallaku and Testa (2018). The search was limited to articles written in English.

Table 1. Summary of the Results for the Search String

Search String	Scopus	Total Sample Size on Scopus	WoS	Total Sample size on WoS
“organisational network*” AND (“public” OR “public sector”) AND NOT “intraorganisational network*”		295		209
Limited to:				
Language	English	273		194
Document type	Articles	196		157
Subject Areas	<ul style="list-style-type: none"> – Social Sciences (101) – Business, Management and Accounting (77) – Environmental Science (19) – Decision Sciences (9) – Economics, Econometrics and Finance (8) – Multidisciplinary (3) – Health Professions (2) 	151	<ul style="list-style-type: none"> – Public Administration (37) – Public Environmental Occupational Health (25) – Management (21) – Political Science (17) – Environmental Sciences (8) – Environmental Studies (8) – Health Policy Services (7) – Development Studies (6) – Health Care Sciences Services (5) – Hospitality Leisure Sport Tourism (5) – Green Sustainable Science Technology (4) – Regional Urban Planning (4) – Urban Studies (4) – Education, Educational Research (3) – Multidisciplinary Sciences (2) – Ecology (1) 	120

Table 1 cont'd

Search String	Scopus	Total Sample Size on Scopus	WoS	Total Sample size on WoS
Keywords	<p>Filter by keyword: EXCLUDE: "Human", "Humans", "Nonbiological Model", "Interviews As Topic", "Questionnaire", "Adult", "Capacity Building", "Economics", "Complex Networks", "Economic Development", "Epidemic", "Female", "Information Dissemination", "Information Management", "System Analysis", "Systems Analysis", "University", "Adolescent", "Aged", "Child", "Clinical Article", "Clinical Practice", "Human Experiment", "Information Processing", "Information System", "Information Systems", "Medical Informatics", "Standard", "Surveys And Questionnaires", "Translational Medical Research", "Translational Research", "Universities", "Adaptive Systems", "Advocacy", "Aerospace Engineering", "Aerospace Industry", "Alberta", "Awareness"</p>	122	– International Relations (1) – Operations Research Management Science (1) – Social Work (1) No filter	120
Total papers		122	106	248

Source: the author.

The scope of the articles researched was then reduced to 7 areas in Scopus and 19 in WoS. Using keywords, the number of articles was reduced. At the same time, no chronological restrictions were applied. In total, WoS returned 106 articles and Scopus 122 articles, yielding a total of 248 papers. Table 1 presents the procedure adopted in this study.

Table 1 shows the number of publications published from 1976 to 2022. The last search access in Scopus and WoS occurred on April 2023. This means that, potentially, some publications from the most recent year (2023) were still in the publication process. The number of articles published in 2023 should therefore increase until the end of the year. In terms of the research periods, four were distinguished (Table 2). This procedure was intended to create better opportunities for analysing and understanding trends. To incorporate the most recent developments, the analysis primarily examined articles published between 2013–2023, though several older sources were also taken into account.

Table 2. Articles Published in 1976–2022

The Time Period Studied	Number of Publications Scopus	Number of Publications WoS	Total
First period (1976–1992)	7	–	7
Second period (1993–2002)	15	9	24
Third period (2003–2012)	33	36	68
Fourth period (2013–2022)	74	85	159
Total	131	127	249

Source: the author.

Descriptive literature analyses traditionally include the statistical distribution of articles over time, industries, research methods used and geographic regions covered. However, given the purpose of this study (to develop a typology of public network models), the relevance of such additional analysis would be limited. For this reason, a snowball sampling method was additionally used to review the literature; that is, to further expand the thematic literature review by examining some additional scholarly sources not found in the selected database (Zhang & Banerji 2017).

The purpose of developing a typology is to systematise sets of objects or phenomena belonging to the scope of the relevant science. The typology developed here serves both a theoretical function by indicating trends in the development of

organisational network models, and a practical function by providing a tool for further analysis.

Nonetheless, the wealth of mostly specific approaches and research identified demonstrates the overall importance and ubiquity of relationships in the public sphere. In the collection of articles under analysis, a small number of texts referring to different types of public network models were identified. This confirms the research and methodological gap mentioned earlier.

4. Results

4.1. Review of Typologies of Public Networks

Analysis of the articles (according to the SLR criteria adopted) made it possible to determine the main characteristics of public networks and their types due. The review of the literature that was carried out allows us to conclude that the category of public networks is also internally diverse. Authors propose numerous classifications of public networks, though few classifications indicate clear criteria for their distinction. A summary of the typology of public networks given the adopted criteria based on the literature review is presented in Table 3.

The overview presented here shows considerable diversity in the criteria for distinguishing public network models and, thus, indicates many types of such networks. This summary presents the proposals of selected researchers in this area.

The authors adopt as criteria: the level of formalisation, the motives for creation, the scope of activity, the purpose of the action and the strength of the relationship, the method of management, and the area of operation. Several authors (Van de Ven & Walker 1984, Agranoff & McGuire 2001, Isett *et al.* 2011) indicate the level of formalisation as a criterion for distinguishing types of networks. Considering this division in the light of other typologies proposed in the literature (including the proposal presented in this article), it is clear that various forms of cooperation within the network in the public sector may be more or less formalised. The work of Provan and Lemaire (2012) looks at the level of network formalisation, though the criterion for the division they used is the motives for creating the network and whether the networks created are top-down (more formalised) and on the initiative of members (emerging, often less formalised).

Mandell and Keast (2007) propose a division into cooperative, coordinating, and collaborative networks. The authors considered the criterion of the purpose of action and the strength of the relationship. It seems unclear because the types of networks they indicated also differentiate the degree of integration of activities and the scope of independence in operation. Their work correlates somewhat with Kenis and Provan (2009), who focus mainly on the methods of managing networks. However, Kenis and Provan distinguish three types of networks, focusing particularly on the

method used to coordinate networks (jointly managed, coordinated by a leading organisation or an external body). Many studies look at partnerships (Hudson 2004, Kruckenberg 2015), while classifications of various inter-organisational networks are extensively discussed, including by J. Niemczyk (2006).

Table 3. Summary of Selected Typologies of Public Networks Due to Different Criteria

Author	Criterion	Type of Public Network
Provan and Lemaire (2012)	motives for establishing	<ul style="list-style-type: none"> – imposed (their creation is imposed by regulations or at least initiated top-down) emerging (created on the initiative of members) – mixed
Agranoff and McGuire (2001), Isett <i>et al.</i> (2011)	level of formalisation	<ul style="list-style-type: none"> – formal (organised by formal mechanisms as inter-organisational agreement or statutory activities) – informal (informal in legal terms, but permanent, organised and mission-oriented)
Mandell and Keast (2007)	purpose of action and strength of relationship	<ul style="list-style-type: none"> – cooperative – coordinative – collaborative
Kenis and Provan (2009)	mode of management	<ul style="list-style-type: none"> – jointly managed (organisations act jointly, without a separate managing body, decisions are made collectively) – with a lead organisation (decisions and activities are coordinated by one of the organisations) – externally managed (network activities are coordinated by a separate administrative body)
McGuire (2006)	scope of activity	<ul style="list-style-type: none"> – informational (consist of stakeholders focused on information exchange) – developmental (information exchange is accompanied by knowledge acquisition by members of individual organisations) – supportive (solutions created are implemented at the level of partner organisations)
Klijn (2008), Isett <i>et al.</i> (2011), Blanco, Lowndes and Pratchett (2011)	area of operation	<ul style="list-style-type: none"> – governance (involve institutions that operate at the meeting of public service delivery and policymaking) – political (area of action is the common interest of organisations in a specific policy area) – collaborative (consist of organisations working together to provide a public good or service, with the assumption that the partners individually are unable to produce the good or service in question)

Source: the author based on: (Austen 2014, Agranoff & McGuire 2001, Isett *et al.* 2011; Provan & Lemaire 2012, McGuire 2006, Mandell & Keast 2007, Kenis & Provan 2009, Klijn 2008, Blanco, Lowndes & Pratchett 2011).

The literature distinguishes the following types of cross-sector partnerships: cross-sector partnership, multi-stakeholder cooperation, cooperation in achieving goals, social cooperation or multi-stakeholder alliances, multi-sector or cross-sector partnership, partnership providing social services, public-private partnership, partnerships of business and local communities, private-social partnerships (Kruckenberg 2015, Niemczyk 2006). Territorial (geographical) range is not a criterion for distinguishing public networks, nor is the nature of the relationships that dominate in the network.

The above analysis of the divisions of public networks presented in the literature is the basis for the typology of public networks developed for this paper. A typological division was used for three reasons. First, it is more flexible than classification. Second, it need not be exhaustive and separable. And third, the division of objects into certain types is usually used when the use of classification would be difficult to read in the analysis due to the too extensive structure of classes and the small number of observations assigned to individual classes. It is nothing more than systematisation, which focuses mainly on grouping, ordering, and dividing specific categories.

4.2. Typology of Public Networks

The literature was synthesised in the final stage to establish typologies for public network models. The content of the articles was analysed and a typology of public networks proposed (see Fig. 1). The typology comprises four categories of public networks: global public networks, public organisation networks, local government networks, and partnerships. It differs from the typologies cited in that it adopts the criterion of geography (global and local) at the first level of division and the criterion of dominant network relations at the second (local reach). These networks are predominantly of a cooperative and coordinated nature and can be formal or informal, as referenced in earlier divisions (Van de Ven & Walker 1984, Agranoff & McGuire 2001, Mandell & Keast 2007, Isett *et al.* 2011).

The (territorial) scope of public networks can be local, international or global. A global public network can be defined as a multifaceted linkage within a “learning” structure aimed at achieving an everyday long-term (strategic) goal; it does not have an economic dimension so much as a social one (realising the public interest). Entities participating in such networks undertake joint actions that imply a lack of competition between entities within the network (the idea of shared responsibility). In this type of network, it is essential to maintain the cohesion of ties and improve the rate at which participating entities converge. The flow of knowledge between participants occurs on the basis of equal and universal access – that is, thanks to the creation of internal quasi-public knowledge. In addition, the creative element of feedback is also present, allowing for the improvement of information

while adding a multiplier effect. Humanitarian organisations (international and local NGOs) working together in a network structure on a global scale are a good example of such networks. Such networks are created to provide humanitarian aid during emergencies and crises.

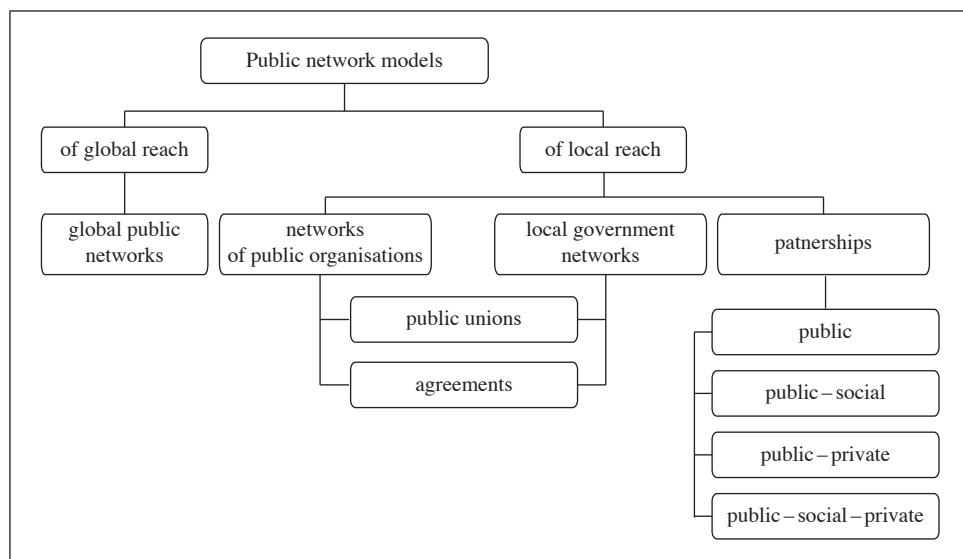


Fig. 1. Typology of public network models

Source: the author.

Local public networks can be formed as either public-legal or private-legal forms. The former comprise networks based on municipal agreements and unions. The second category is a variety of networks constructed on the basis of named and unnamed agreements. J. Niemczyk (*Sieci międzyorganizacyjne...* 2012) defines the process of creating inter-organisational networks in the context of the relationship between the administrative space in which the local government operates, and the functional space. Niemczyk points to three basic dependencies:

- when administrative boundaries are inside the functional space (under-bounded),
- when administrative boundaries surround the functional space with excess (over-bounded),
- when they surround it “compatibly” (truly-bounded).

At the local scale surrounded structures are most common. An example would be a smaller administrative space, such as a municipality or county, being located inside a larger functional structure. Under-bounded structures most often force network cooperation in the form of municipal unions and agreements.

In the light of the above, we can talk about two categories of public networks (appearing both as local government networks and public organisation networks – see Fig. 1). The first category is formed by inter-organisational networks, which are not exhausted in contracts only, but lead to the creation of a new organisation/structure such as a municipal union. This is a public legal entity that acquires rights and incurs obligations in its name. In addition, by joining the union, the entity assumes obligations to the union, as defined by statute, as well as to the other nodes of the network. The second group is formed by networks that are joint venture agreements. These do not lead to the creation of a structure or legal entity. Rather, the network exhausts itself after the contract. The municipal agreement has the logic of a network thus outlined.

Public networks can also be formed as private-law agreements, and are based on something more than a calculation of self-interest, including the highest level of trust. All types of named and unnamed contracts (e.g., based on a consortium agreement) come into play here.

Partnerships make up a separate category of public networks. The literature and policy documents show a wide range of approaches to and definitions of such partnerships, which involve cooperation, reciprocity, assistance, and trust. In the local context, partnerships involve the cooperation of local partners carrying out joint activities to benefit a given local community (municipality, district). Partnerships can be a strategic alliance of representatives from different areas of social life contributing common resources, sharing risks and costs while jointly sharing in the benefits. More specifically, the local partnership can be defined as all kinds of undertakings and initiatives jointly planned, designed and systematically implemented using innovative tools and means. Cooperation is undertaken to ensure the development of the local environment and to build identity. It is a joint long-term coalition of partners (public, social, private) for the benefit of a specific area, with equal sharing of resources, responsibilities, risks, and benefits.

The local partnership need not be formalised; it can be based on an informal agreement between partners, thus not resulting in official commitments but referring to good relations between partners and a common desire to achieve established goals. Most often, however, and especially when one of the partners is a representative of the public sphere, it is a formalised agreement of activities and ties. Contracts and agreements concluded under civil law (formal partnership without legal personality) are the simplest form of cooperation between partners. Parties to such an agreement can be both public entities and NGOs or entrepreneurs. This type of solution leaves partners with a relatively high degree of flexibility in formulating the directions of cooperation and mutual obligations. Another possible form is a formal partnership with a legal personality (in practice, most often associations, less often foundations).

Drawing on the knowledge and experience of all network partners, a network established based on partnership fosters innovative solutions, which are an added value for a given local community. Coordination of local activities, collaboration, and the social activity itself occur thanks to such cooperation.

5. Directions for Further Studies and Conclusion

From the discussion, it is clear that public networks have their own characteristics and differ significantly from other types of networks, such as business networks. A review of the literature offers clues to the directions for future research in the field of public networks:

1) evaluating the effectiveness of public networks: there is a need to adapt performance evaluation indicators to the specifics of a particular public network, including its mission. Performance measures of public sector organisations should not be the same as performance measures of commercial organisations, due to the peculiarities of these two groups (Kim *et al.* 2022). In the case of public networks, financial indicators have limited usefulness in assessing performance. Public organisations are not expected to make a profit, their ultimate goal being to serve the public interest. The public value created by public networks, unlike the value generated by other private networks, can rarely be expressed in money and is often determined by a political factor, which makes it impossible to focus solely on achieving goals, such as service delivery (Voets, Dooren & van Rynck 2008). Such of the discussion of public network effectiveness centers around the tension between two organisational assumptions – accomplishing the mission and obtaining adequate funding;

2) the stakeholder approach assumes that an organisation undertakes a wide range of activities, each of which can generate different results. This approach considers the organisation's relationship with the environment and pays attention to the results of the organisation's activities. This multifaceted approach is based on the simple assumption that all stakeholders, being in a relationship with the organisation, expect benefits for themselves. Therefore, each stakeholder group prefers a different behaviour from the organisation – one that will exactly meet their expectations. Each of these groups also has its criteria, by which it evaluates the organisation's effectiveness. Organisations rarely meet the criteria necessary for different stakeholders simultaneously (Ha, Lee & Feiock 2016);

3) the growing role of trust – an organisation's success or failure can be measured by the level of trust and legitimacy it is afforded. In addition, the importance of the services provided by public networks to society must also be considered as their implementation is required regardless of the conditions. The output produced by the public sector is considered more trustworthy than that produced by the private sector, and performance in this regard can be assessed using criteria such as survival and certainty (Voets, Dooren & van Rynck 2008, Dudau *et al.* 2020);

4) evaluation of effects conducted at different levels of analysis (at the actor, dyad, triad, group, organisational and inter-organisational levels). Most studies (Provan & Milward 2001, Austen 2014, 2018, Favoreu, Carassus & Maurel 2016, Bianchi & Trimigno 2021) confirm the existence of relationships between the indicated levels of network effectiveness assessment and indicate both their complementarity and the direction and strength of their influence. “Bottom up” impacts are shown to be stronger, which allows for the conclusion that achieving positive results at the community level – a public network’s main goal – will help achieve results at the level of the network and the organisation. Also, results at the network level are more significant if efficiency at the organisational level is high.

To sum up, this article has focused on collaborative public networks. In managing different types of public networks, it is necessary to conceptualise one’s orientation towards cooperation and the orientation towards competition, taking into account the multi-level context. This is a universal approach to different types of public networks. In conclusion, evidence for the benefits of reconciling contradictions in cooperative networks is worth pursuing, as is an attempt to reconcile the contradictions between the orientation towards cooperation/competition in public networks.

The proposed framework for the typology of public network models is preliminary work, given the limited research in this area thus far. While it serves an essential theoretical purpose, the typology can also inform the development of guidelines for social and economic practices. This framework can benefit scholars studying network approaches in managing public organisations and students and practitioners in this field. The practical utility of this proposal lies in its potential to evaluate various types of public network models, enabling diagnostic findings and facilitating comparative and dynamic research for the analysis and assessment of these models.

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