

## **New Approach to Network in Public Administration**

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*More often a contemporary literature considers the importance of networks in the public sector. The concept of a network evolved from social anthropology and socio-metrics where structure of a society was presented as a complex relation between individual and collective actors. Since then networks have been used to study sociological but also, more recently, economic phenomena. Public sector bodies are organized and managed as network structures therefore there is a necessity to measure them using analytical tools available for network structure measurement (Kickert, Klijn and Koppenjan, 1997, p. XVII). This is especially difficult in the context of diversity of the public services delivered as part of different governance structures. The article aims at proposing a model of performance measurement of the public administration institutions. The authors of this article will concentrate on a study of existing public administration networks in its current form that is in the real sphere of its functioning. Network governance is responsible for establishing policies, while the public administration network is superimposed a duty to implement them. Design of public administration network consists of no centralized authority which contradicts a typical organization of enterprises in a hierarchical manner. Therefore, command and control model of the public administration becomes typically outdated, although at times, is still useful as part of the network. This is substituted by other models of management related to responsibility and coordination. A researcher faced with a complex system of public administration should have the tools for assessing the effectiveness of public administration network and should be able to measure the costs and external effects of its operation. From the practical perspective, network performance measurement can be completed ex post based on satisfaction criteria. Actors, that is individuals taking part in network, note their goals and assumption prior to taking place interaction in the network and after interacting they analyze the relations including: time, input of resources including personal energy and money (Teisman, 1993). In the subject literature an increasing number of publications, the public administration is seen as a network. However, such public perception is relevant mainly in the theory of science, including political sciences and focuses on legal, institutional and managerial issues. There is a pressing and essential need to develop economic literature in this area that would present the method of measuring performance of the public administration network both from the perception of cost and economic evaluation of externalities. An evaluation of public administration network and its management poses a difficult task for economists. Although there are many studies in the*

*area of qualitative research including F.W. Scharpf (1978, p. 345-370), W.J.M. Kickert, E.-H. Klijn, J.F.M. Koppenjan (1997), A. Vazakidis, I. Karagiannis and A. Tzialta, (2010, p. 376-382), there are few quantitative studies. Those that are present use managerial accounting aspects to analyze public administration network phenomena such as Activity Based Costing and Balanced Scorecard. The authors will propose a theoretical model which is based on contemporary theories of management as well as elements of Balanced Scorecard suitable for public administration.*

## **INTRODUCTION**

While proper organization of public administration has been studied by researchers for centuries, the development of the concept of a network is relatively new. The idea evolved from social anthropology and socio-metrics where structure of a society was presented as a complex relation between individual and collective actors (Marsden, 1990, p. 435). The concept evolved simultaneously in various paths of humanities – political science, management and economics and also mathematics (Klijn, 1997, p. 29 in Kickert, Klijn and Koppenjan, 1997). In economic sciences, the starting point was an idea of rational organization which was had to be transformed for conditions in which full information was non-existent. This led to development of interdependent linkages to provide decision-taking actors with needed information. While this seemed as a trivial outcome, in fact it was a revolutionary idea that provided a support for organization as a network instead of linear form.

Today, networks are considered to be a fundamental characteristic of modern society, therefore contemporary researchers should undertake the study of decision-taking, organization and management through networks (Kickert, Klijn and Koppenjan, 1997, p. XVII). These days, the notion is widely used in various humanities particularly economics and sociology. Differing factor between applications of the concept of network in these two is that economics attempts to study networks quantitatively.

The aim of the following paper is to present the idea of networks in public administration with its primary characteristics and show the means by which such networks can be analyzed in economics.

The paper is organized as follows: the first section discusses the differences between network management, network governance and networks in public administration. Furthermore, it presents the most significant characteristics of networks in public administration. The second section describes the ways by which networks can be applied and implemented in public administration such as Activity Based Costing and Balanced Scorecard. The third section briefly states the depth and dilemmas of qualitative and quantitative research of networks in public administration. The fourth section concludes.

### **Section 1**

The key element to understanding of networks in economics is differentiation between various kinds of networks. The concept of network governance applies to linkages in law-setting bodies of countries. Governance networks are those which link actors – institutional or individual – who are responsible for formulation of law that public administration puts into effect. Kickert, Klijn and Koppenjan (1997, p. XVII) define governance network as quite stable relations between various governmental and private groups in which decision-making in regards to policy takes place. It is important to notice that governance networks are linked with institutional context of a country (Kickert, Klijn and Koppenjan (1997, p. 1), therefore allowing us to analyze through actors not only the network itself, but also the greater scope of economic, strategic and political decision-taking. Governance networks can be very extensive including such organizations as governmental law-prescribing and law-making bodies, non-governmental organizations, research organizations and lobby groups.

While these are responsible for delivering policy, public administration is in charge of its application. Public administration cannot change the policy they enact, although it can provide feedback on law to law-making groups. Public administration can be organized in a form of a network as opposed to more typical in the past – hierarchical structure.

Network structure of public administration has many characteristics which differentiate it from other forms. Dependency as in Scharpf (1978, p. 345-370) is seen as one of the key distinguishing elements. It

means that parts or nodes of the network are dependent upon, in various ways, on each other. That is, one part cannot function independently of other parts and requires support to complete the aims. This dependency can be based on importance of resources which means that one part of the network holds all or most of its resources and distributes them at request. Such structure is potentially conflict-prone if conditions necessary for distribution are not clearly stated. Dependency can also be a result of resources exchangeability which means that parts of a network exchange resource, for example human resources, when needed. Once again, such a situation may lead to conflicts if rules are not clear and transparent as to which resources, under which conditions and for how long should be a subject of exchange. Giving one part of the network responsibility of resources, makes this part more important in relation to other parts and so, in general may lead to disagreements. Therefore, while dependency is an inherent characteristic of networks, the distribution of resources must be carefully planned in order to avoid inability of network to fulfill its goals.

The reason for such planning is a precise creation of needs and aspirations of a society. This is turn is strongly integrated with an important characteristic of networks that is actor perception. Through the process of managing, the perception of actors changes. Actors are people who are involved in a network. Their reactions and behaviors can and should be managed by the manager. It is important to note that networks must also be managed. This management can be spontaneous with no one specific person or part of a network responsible for it or specifically assigned. There are two primary methods of managing the perception of actors. The first social strategy is aimed at creating and maintaining appropriate social relations between network members. In this strategy the following techniques are used: (1) formulation of new procedures to be followed by actors, (2) taking measures in order to avoid exclusion one an actor or a group of actors which can greatly hinder the ability of network to fulfill its goals, (3) introduction of new actors into the network structure to add to the mix new fresh ideas which can be especially useful to avoid groupthink trap (Termeer and Koppenjan, 1997, p. 89-96 in Kickert, Klijn and Koppenjan, 1997). The second type, are strategies related to learning. The following techniques can be used: (1) support of development of a common language which will aid in building a common culture, (2) forbiddance to put down any ideas regardless of how strange they appear which makes the actors comfortable to learn and experiment, (3) encouragement to introduce new ideas and implement them whenever possible and (4) strengthen the role of feedback in the learning process (Termeer and Koppenjan, 1997, p. 89-96 in Kickert, Klijn and Koppenjan, 1997).

The use of these methods as well as tools in order to bring forth the results of the public administration network are strongly dependent upon the problem that must be solved by the network structure and the nodes which are responsible for problem-solving. Different strategies and tools will be applied for problem-solving at institutional (governance) level and different and operational (public sector) level (Bruijn and ten Heuvelhof, 1997, p. 121 in Kickert, Klijn and Koppenjan, 1997). Implementation of techniques, which occurs through actors, will result in clearer definition of aims and actions which must be undertaken to accomplish it (O'Toole Jr., Hanf and Hupe, 1997, p. 139 in Kickert, Klijn and Koppenjan, 1997).

Perception of actors is also central to the multi-actor perspective to management which developed as a rebuttal to authoritative management model (Kickert, Klijn and Koppenjan, 1997, p. 10). In this model the manager is in charge of distribution of resources while actors are generally independent in terms of planning their activities. In this model of management, which is also a characteristic of networks in general, actors are not only bound by formal but also informal *ad hoc* relations. If such mechanisms are used at governance level this can be a decentralization of policy-making which, on one hand can lead to stronger engagement of employees and greater variety of ideas, but on the other it can lead to greater risks such as stronger lobby groups and even corruption (Marsh and Rhodes, 1992). In public administration such decentralization is rarely found as fulfillment of aims requires centralization. Therefore, network perspective is in line with the multi-actor perspective of management. Multi-actor perspective assumes one central governing authority, while manager is responsible for coordination of resources and management of preferences and perceptions of particular actors in a network (Friend, Power and Yewlett, 1974 and Scharpf, 1978, p. 345-370).

Above the general characteristics of networks either governance or public administration were presented. These are common to all networks regardless of its goals and environment in which they operate. However, based on conducted research, the authors of this article present eight characteristics specifically of public administration networks. Again, -these are objective criteria which are a part of every public administration network regardless of their goals:

1. The length of main network process and its sub-processes. This is measured in the units of time. The general assumption is that the longer the process, the more time it consumes.
2. Network architecture. This is measured by a number of nodes in the network. The general assumption is that the more complex the network structure, the more nodes in the network.
3. Number of actors engaged in the process. This is measured by the number of people in each node and the total number of actors per a network. The general assumption is that the more complex the aim and thus the main complex the network structure, the more actors will be needed to satisfy it.
4. Cost of the network. The cost is measured by time multiplied by the number of engaged persons multiplied by average salary in public administration at level necessary to fulfill the goals of a network. The general assumption is that the more complex the aim and thus the main complex the network structure, the more it will cost.
5. The direction of operations. This measure gauges the relations between various nodes which symbolize operations.
6. Number of mistakes possible and real within the network. This is measured by the number of errors that can be made by actors with the public administration network and then, based on quantitative research, the number of mistake actually made. The number of errors made should be lower than the number of possible mistakes. The general assumption is that the more complex the aim and thus the main complex the network structure, the more mistakes made in theory and in practice.
7. The amount and type of losses. This is measured by cost incurred due to errors made. The general assumption is that the more mistakes made in theory and in practice, the greater the losses incurred by a public administration network.
8. The number of repeated / redundant functions. This is the number of operations repeated in the entire network. A control of the operation is not considered its redundancy. The general assumption is that there should be no repeated operations in the network. If there are they generate additional costs and therefore losses for the network.

All the above described variables are objective measures which can be used to measure public administration network's efficiency and effectiveness.

## **Section 2**

Another method to measure efficiency and effectiveness of networks is Activity Based Costing (ABC) method. This technique was proposed by Kaplan and Cooper (1987, p. 204-228) as an answer to disadvantages of traditional costing incorporated into Profit and Loss Account. Activity Based Costing is more and more often used by scientists to assess the costs of processes (See among others: Vazakidis, Karagiannis and Tsiailta, 2010, p. 376-382). This costing method is directed at processes which exist in the organization where process can be defined as a series of operations, having clearly-defined beginning and end inputs, outcomes and results. Information is considered to be an input in this process. In public administration this can be, for example, a request from a client to carry out a task such as issue an identity card or grant building permit. While outcome is objective that is the client gets the identity card or building permit or not, the result is a value added for a client.-a person derives utility from having an access to a good. A significant characteristic of Activity Based Costing is concentration on a result which must be measurable. That is why the technique can be successfully applied in public administration network where the fundament for measuring the result are time spent for providing a good to the client and the cost of the process.

In order for the Activity Based Costing to be implemented in a public sector, the processes undertaken there must be divided into main processes, sub-processes, operations and activities. The processes as well as sub-processes are managed by managers, while operations and activities are performed by individual workers. They should be identical to the position description of the person in charge of operations and activities. Once the processes are divided, costs should be linked with activities and then grouped upwards until calculation of process cost (See for example, Kostopoulos, et al., 2003, pp. 121-135 and Municipality of Argyroupolis, 2005).

However, in order to implement network-wide change the Balanced Scorecard can be especially useful. Balance Scorecard is an instrument of strategic management that forces the company to consider strategic management in enterprise as a composite of four dimensions: financial, client, internal processes and development. Each perspective is directly linked with the mission and vision of the enterprise and is connected together with organizational processes by cause and effect linkages. Moreover, the Balanced Scorecard includes a system of balance measures, hence its name, as it equalizes (a) results with leading measures (lag indicators vs. lead indicators), (b) objective with subjective measures, (c) financial with non-financial measures, (d) short-term with long-term measures and (e) external with internal measures (Świdarska, 2003). Therefore, the Balance Scorecard can help managers of both public and private organizations organized in network understand the processes within as well as its needs and risk. Although the costs of implementing it may be quite extensive and the process itself quite complex.

An alternative method of assessing public administration network is decision-trees. In this method trees represent processes whereas nodes represent activities. For each tree, the most effective and the most efficient path should be prescribed. This method allows the researcher to show the optimal path and compare it with the one that occurs in practice and, alike in Activity Based Costing, assign costs to processes.

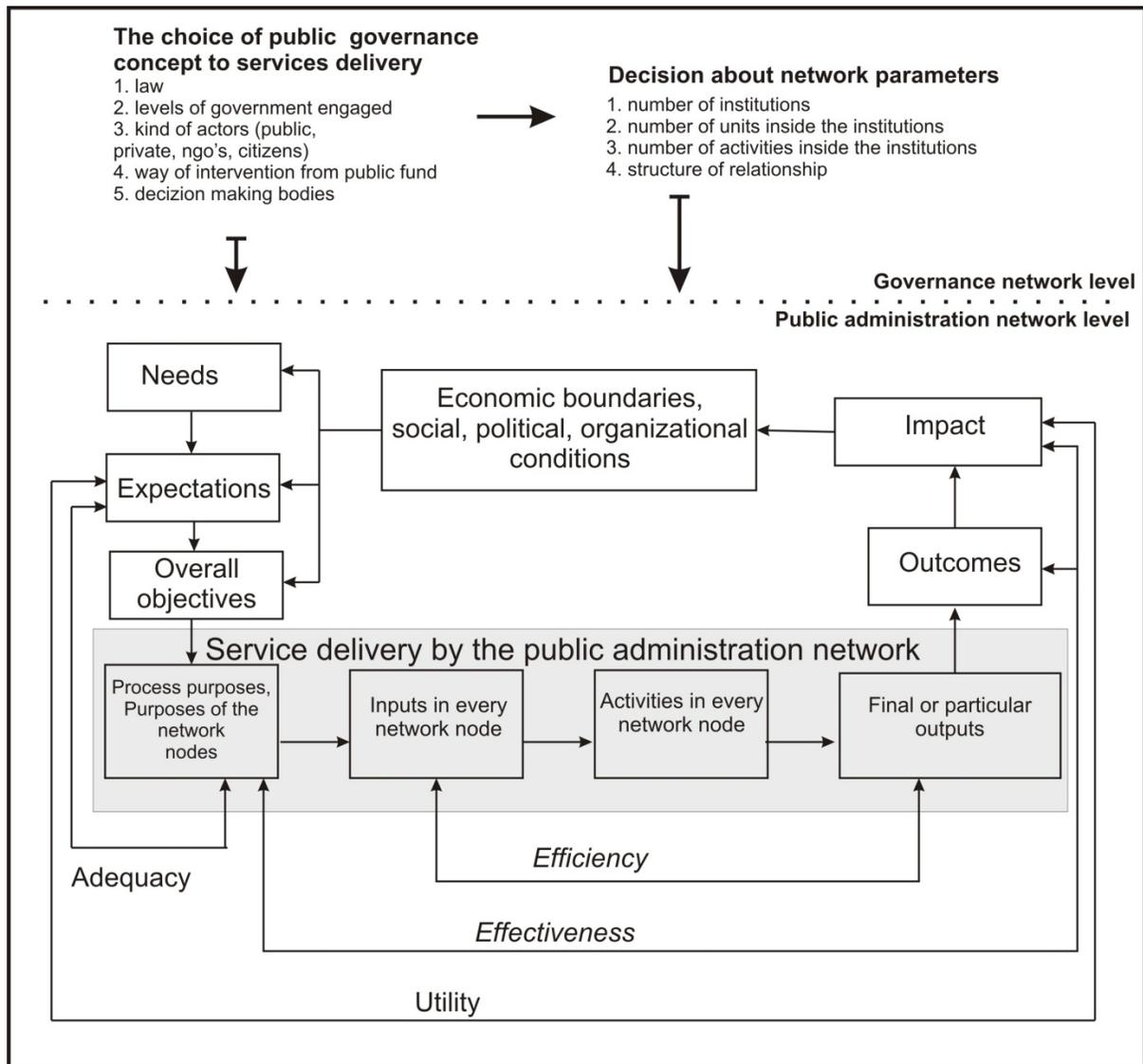
Yet another of performance measurement of public administration networks is a critical path method (CPM). This method is used to analyze the path taken by the request submitted by the individual or an organization for public administration from beginning to the end. Once, the time necessary to complete specific operations – nodes can be estimated, the critical path should be chosen as the one in which redundancy and bottlenecks do not exist. Then, the cost of the critical path can be estimated. However, if the time necessary for each operation to be completed cannot be precisely and clearly estimated, then another method should be used (Tseng and Ko, 2010, p.44). Tseng i Ko (2010) proposed formulating a critical index defined as a ratio between the number of all tries and the number of tries in which the individual's or organization's request for service has found itself on a critical path (Sztub, Bard and Globerson, 1994). Application of this method in public administration networks has a great potential when assessing effectiveness and efficiency of non-standard requests, for example, infrastructure projects which are partially financed from national or local budgets.

To summarize, there are various ways to measure public administration network. Origin of each method is a bit different and emphasizes various characteristics of public administration networks. Therefore, when assessing networks' efficiency and effectiveness, it is important to choose a method which suits the aims and subjective characteristics of a particular network.

### **Section 3**

Below are presented multi-dimensional criteria and measurements of public administration networks which take place among various network nodes. The general method of measurement of the functioning of public administration network can be found on the input-output scheme for the public sector.

**FIGURE 1**  
**INPUT-OUTPUT SCHEME FOR PUBLIC ADMINISTRATION NETWORK**



Source: Composed by Piotr Modzelewski based on: Ch. Pollitt, G. Bouckaert (1999), p.13

It is a general enough approach that it is useful also in discussion on public administration networks. The levels can be specified on which networks in public administration can be studied. The first level is a level of governance, on which a choice of concept / way of delivering services or public goods is chosen. Among others, this level also includes law based on which specific parts of public administration and its actors are engaged in the process (public, private, non-profit organizations, citizens), what kinds of intervention are expected, and what are the decision-making bodies. On the governance network level decisions about network parameters are needed, i.e. number of institutions acting during service delivery, number of units inside the institutions, number of activities inside the institutions, structure of relationship.

On the public administration network level, firstly, overall objectives must be formulated. They should stem from the needs and expectations requested by either individual citizens or institutional

clients. Overall objectives of the public administration should determine many particular aspects of the process, such as its purposes, aims of the network nodes. Inputs at every network unit should be appropriate to activities needed in every network node and to expected outputs.

Outcomes of public administration network may be linked with satisfaction of clients of services and public goods. In case of technical services, additionally they can be intertwined with other factors, for example, longer time of travel if the public road will not be built.

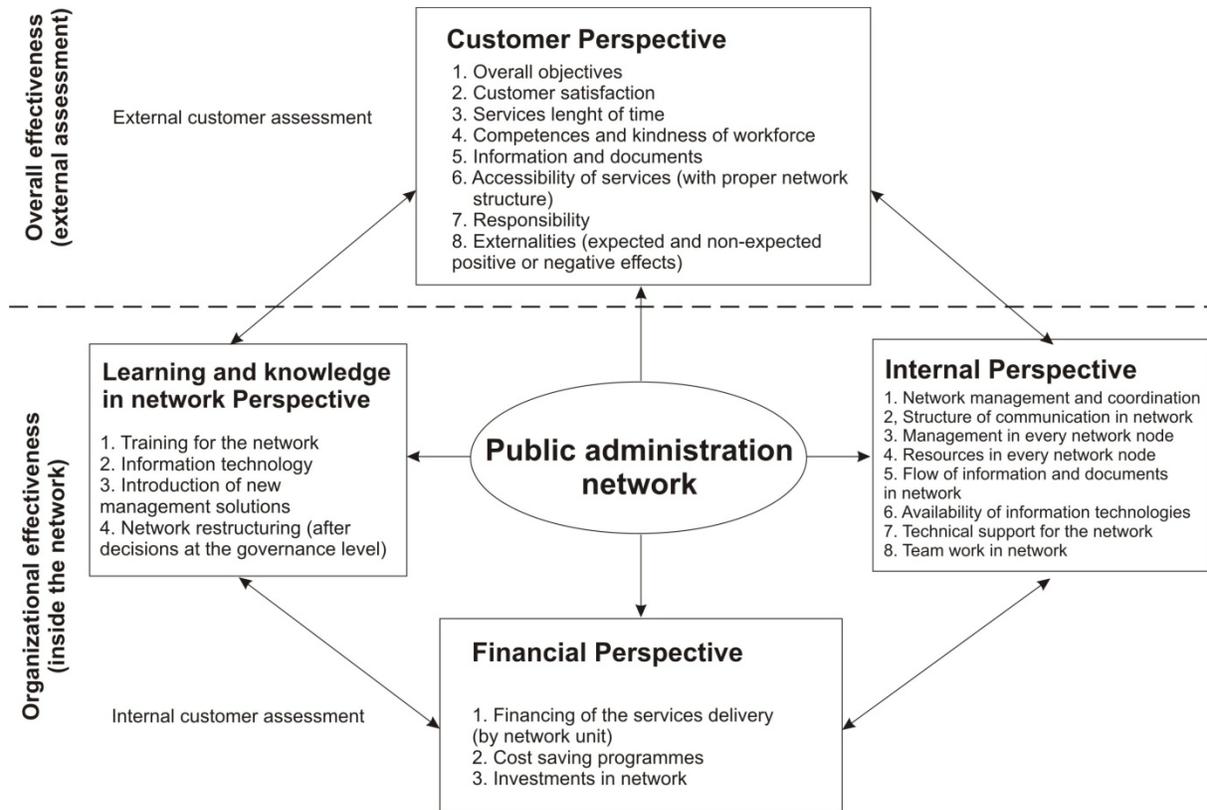
Impact of public administration network depends of the type of services supplied by the network. In case of administrative services the impact may be linked with negative externalities to clients such as financial costs borne by clients loss of time due to the service delivery process (for example, giving a decision in the maximum allowed by law time or providing decisions after the legal deadline), costs bore as a result of no decision (for example, lack of construction permit may increase investment costs, freeze of capital, inability to allocate capital in a different more productive way) and other costs related to lack for client of necessary documents, permits, etc. In obvious way externalities are intertwined with the level of importance of services being requested – it would be difficult to compare externalities due to errors in various public administration services such as in identity card and/or in construction permit issuance. In case of technical services, externalities of public administration network can be linked, for example, with lack of important public road (increase of transport costs) or burden of environmental pollution carried by society. In case of social services, externalities of public administration network functioning can be related to incorrect decisions, for example, in social policy – errors in adoption decisions have lasting and difficult to measure effects for the persons they pertain to.

Relationship between objectives and outcomes or impact is called effectiveness – this is related to a degree to which outcomes are achieved in comparison to stated aims. Relationship between inputs and outputs is called efficiency (related to optimization in economics). To ensure fulfillment of higher aims by public administration network and attainment of products, results and impact requires a broad look on the network. A useful tool which can be used to assess functioning of public administration network is Balanced Scorecard (Kaplan, Norton, 2004, p. 204-228). Guarantee of high overall effectiveness is to a large extent determined by organizational effectiveness. In each of the four perspectives it is necessary to delineate variables thanks to which it will be possible to present dilemmas of public administration network in economic terms. Quality analysis must be enriched by quantitative analysis.

In the customer perspective we can consider some specific areas of analysis: overall objectives, customer satisfaction, service length of time, competences and kindness of workforce, information and documents, access to services (with proper network structure), responsibility, externalities (expected and non-expected).

In the internal perspective we consider: network management and coordination, structure of communication in a network, management in every network unit, resources in every network unit, flow of information in the network, availability of information technologies, team work in the network. In learning and knowledge perspective we can distinguish the following areas: training for the network as a whole, information technology, introduction of new management solutions, network restructuring (after decisions at the governance level). In the financial perspective, we can characterize: financing of the services delivery (by network unit), cost saving programs, investments in networks.

**FIGURE 2**  
**BALANCED SCORECARD FOR THE PUBLIC ADMINISTRATION NETWORK**  
**(THE CASE OF ADMINISTRATIVE SERVICES)**



Source: Composed by Piotr Modzelewski, Ph.D. based on: R.S. Kaplan, D.P. Norton (2004).

Measurement of functioning of the public administration network necessitates defining nodes comprising it. We can define (a) nodes inside a given institution, (b) nodes outside of given institution. For instance, assessment of public administration network may define relations between various units of an organization as well as relations of organizational units with other institutions. Taking into a consideration a fact that measurement of each node of public administration network may be difficult and time-consuming; one solution is to take on a perspective of leading supplier.

On Figure 2 the authors has presented the Balanced Scorecard for public administration network supplying administrative services. In the client perspective the most important thing is to ensure fulfillment of higher aims in accordance with legal requirements of administrative decision-making. However, customer satisfaction is also equally important. Customer satisfaction may be impacted by many variables, such as the time required to take care of the matter, competences and kindness of workforce, information and documents, accessibility of services. Availability of information is linked to other parameters of public administration network such as the number of nodes the client must contact. Responsibility may have an extraordinary impact of client satisfaction, especially in the case of problems in a network such as complaints on the way services are delivered. Unclear and diffused responsibility will make it more difficult for clients to fight for their rights. In client perspective yet another important element are externalities of supplied services. These effects may be expected or unexpected, positive or negative. The attention of researcher should be focused on negative unexpected externalities since these

create a potential danger to the way quality of services is perceived by not only the individual part but also the whole public administration network.

In operational perspective the most important element is network management and coordination. The lack of appropriate division of tasks, activities and responsibilities in a network can cause its paralysis. Especially, if there is an inability to impact weak nodes in a network. Many times, a phenomenon of "backlog of requests" in individual offices or in individual organizational units occurs that leads to the inability to shorten taking care of the matter. Officials often make use of all legally available time to keep public documents at individual nodes and thus consequent nodes in the network of public administration have too little time left to settle the matter on time. This may be due either to the inability to have a real impact on other parts of the network or due to a lack of trust and an atmosphere of cooperation inside the network.

Structure of communication in network has a significant impact of delivery of services as at times quite complex flow of information in public administration network arises. The possible relations are: consultation, opinions, advice, approval and signing, certification, comments and corrections, and many more. In some cases, these relationships may occur continuously or periodically, greatly prolonging the settlement of the matter. Frequently, structure of communication in a network is determined by rules of law, but in many cases some improvements are possible. An additional difficulty in improving the efficiency of internal processes in the network is the existence of differences in management of the individual nodes of the network. Qualitative and quantitative research, however, should answer the question "which areas of management in different parts of the network need to be corrected?" Another issue is the allocation of resources among network nodes as in many cases there are significant differences in access to resources among different network parts. If some network links are within a public institution, changing the allocation of these resources is easier. Problems arise when there are significant differences in the availability of resources between institutions. Then the allocation of resources is difficult, although not impossible. For example, employees of the Ministry may be transferred to work in a government agency dedicated to the delivery of particular services and/or public goods.

Another problem is the flow of information and documents in a network. Length of the network, the number of nodes or the number of network operations necessary to provide a service may have an impact on the process of information flow between nodes. A measure of the difficulty of the level of complexity of the case may be the number of steps which the public administration employee has to take to get the case resolved. This may be in some sense a common denominator that allows comparison between different network nodes. In a general way, the intensity of the work necessary in dealing with a particular type of administrative services can be captured. Therefore, the process approach to quality management systems can facilitate the analysis of public institutions.

In the operations perspective availability of information technologies can be of great significance. Particularly useful here are the electronic workflow systems as well as an electronic signature that can be used between nodes of the network. Coordination of technical support for the network may also be an important factor in the process management. In the case of specific projects very important issue is team work in a network. In more common services it is not a very crucial factor but it is important in improving coordination and trust in the network.

In the learning and knowledge perspective the main factor is training for the network as a whole.

Moreover, information technology is also noteworthy, as new breakthrough technology is able to resolve many of the problems related to the flow of information between the nodes of a network. Unfortunately, until the autonomous agencies are engaged in the process of providing the services, it is not possible to use information technology to manage resources between organizations, to determine the actual level of costs or to use intranet networks. This leaves the question of how it is possible to integrate a variety of functions within individual offices and to what extent it is necessary to provide instruments to existing organizational structures and to ensure the minimization of losses and difficulties associated with it. It should be emphasized that in many cases it is not possible to change the network structure of public administration because of the nature of specific services. Thus, managers of individual public institutions

should assess how the current state of affairs of the activities of their institutions can be improved, taking into account the functioning of the network as a whole. Another argument in favor of this type of procedure is that, in many cases, clients perceive the service process through the prism of a single public institution with which they interact. They are not aware of how many tasks are performed in the back office in liaison with other public institutions.

Introduction of new management solutions in the network is especially possible in the central government and in satellite offices at the local level. This is due to the presence of uniform organizational structures on the central level determined by law. At the local government level, the introduction of new solutions is much more difficult because of the autonomy of decisions taken by the local authorities. However, it should be taken into account that the local authorities have the possibility to implement top-down management solutions in supervised public administration units. Network restructuring is possible only after decisions at the governance level. It means that changes of law are necessary in order to make changes in primary structure of delivering administrative services.

In the financial perspective it is necessary to consider the costs of providing services in each node. Recognition of the costs of providing services should be supported by the analysis of operational data on the number of people involved, other resources, the number of elements of the service provided by each network node. In addition, it is necessary to determine the number of services provided by a whole network over a specific period of time. This would allow the establishment cost efficiency as well as operational efficiency.

An additional subject matter is investments in network as, at times, these require sizable investment outlays needed for things such as: servers, computer systems, licenses and they be greater than financial possibilities of nodes in a network. In such cases, it happens that the central government intervenes, creating sometimes even government agencies that receive adequate funding. At the local level it is also possible to select network structure in a way, so that it would be possible to make significant investments in entities that provide public services. Of course, it must be kept in mind that the public network does not function in isolation. The values of each of the parameters shown in Figure 2 may vary due to externalities stemming from close surrounding as well as further public administration network in general.

## **CONCLUSION**

To conclude, the measurement of public administration network is possible and much easier than the measurement of governance network. This is due to the possibility of obtaining empirical data from each node in network administration. Obtaining both qualitative and quantitative empirical data is a prerequisite for research in this field. As with the analysis of a single public institution it is possible to determine the outputs, outcomes and impact for the public administration network. This also applies to the possibility of estimating externalities associated with the provision of services, including administrative services. As the authors have shown, it is possible to formulate balanced scorecard for public networks and examine the links between the nodes. Through the application of the Balanced Scorecard one can provide a comprehensive diagnosis of potential problems that may occur in the public administration network. Data needed in each of the perspectives can come from external and internal customer satisfaction surveys those of directors of individual organizational units, or can be collected on the basis of internal data provided by public institutions. This requires sometimes lengthy and in-depth research, but the complexity of modern public administration and the multiplicity of interactions and relationships necessitates taking this type of effort.

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