

Sign Model of Local Government Efficiency

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Abstract: The article covers the problem of low efficiency of local self-government in municipal units of Zabaykalsky Krai, the Russian Federation. The analysis is made with cognitive model in the form of signed digraph. The author proves chosen variables used as vertices and determines interrelation among the variables through labeling of corresponding edges with signs. The hypothesis about processes in local self-government system is adjusted. The author proposes solutions of the problem.

Key words: Cognitive model • Sign model • Signed digraph • Efficiency of local self-government

INTRODUCTION

Since increasing speed of changes in present-day society leads to significant complexity of social reality, study of social dynamics problems is a crucial task of modern social science. Analysis of great quantity of problems which are important for society deals with extraordinary complex systems. Such systems contain a lot of variables interacting with each other, reacting to changes of each parameter.

Positive experience in model building of complex social systems was gathered as a result of application of cognitive approach [1-5]. The same social phenomena can be seen through different cognitive “lenses” using such a method which provides means of more rapid acquisition of necessary result in a particular situation. Realness is not required from a model. A model should be adequate, operative, i.e. it should provide satisfactory answers to given questions.

Relating to cognitive maps, positive characteristics of cognitive methodology are described by R. Axelrod, but these estimations are also correct for signed digraphs, taking into account that in mathematical language cognitive map is called signed directed graph. “There were three advantages in limiting cognitive mapping to such causal imagery: reliability, infer ability and comparability” [5, P. 260].

Signed and weighted digraphs can be applied in simple model building of multi component social structure, structuring of ill-defined scope, creating a subjective model of a situation, in analysis of results acquired on the base of minimal information, for getting prognosis of situation development and make one’s recommendations for control over a situation [6]. Such models contain multiplicity of simplifications, but they enable us to receive some strong conclusions. Moreover, signed digraph can be transformed into weighed digraph after labeling of graph edges with weight and then into functional signed graph, which is similar to system dynamic models [7].

MATERIALS AND METHODS

Usage of signed digraph as a model of a complex system is bases on the following theories. The most essential variables of the problem are considered to be the vertices of the digraph. If changes in x variable have great direct effect on y variable, the edge connects x with y . This edge will have “+” sign, if the effect is “strengthening” (direct dependence – all others conditions being equal, increasing in x leads to increasing in y and vice versa). This edge will have “-” sign, if the effect results in “slowdown” (inverse dependence).

RESULTS AND DISCUSSION

Nowadays the process of reconstruction and development of local government institute takes place in Russia. The essence of local government lies in realization of opportunities and abilities of local population in organization of life-sustaining activity of a local community, effective use of available resources, development of the territory, administration of current processes. Local self-government should take into account interests of local population, developed historical peculiarities and traditions. Local self-government is carried out on the level of municipal units – i.e. socio-territorial communities, which are heterogeneous in structure and abilities. Studies of municipal units of Zabaykalsky Krai, the Russian Federation, which were pursued by the author in 2011-2013, provide an opportunity to make a conclusion about inefficiency of local self-government. Among the reasons of this fact it is possible to name imperfection of regulatory basis, inadequacy of enumerated powers and financial resources, deprivation of local government autonomy in decision-making process. Excluding influence of political and economical factors on local government operation in modern conditions, we have addressed social factors of local self-government inefficiency in municipal units of Zabaykalsky Krai.

Russia has vast positive experience in local administration. An interesting example of it is an organization of Cossack village public administration. This example is significant for Transbaikalia, because Cossacks composed no less than 1/3 of the whole local population after establishment of the Transbaikalia Cossack Host on March 17, 1851. A range of issues (authorities) was defined for local government decision by statute of Cossack village public administration: “election or appointment for public offices in Cossack village administration, finding ways and measures to organize public assistance, land distribution, money management in a Cossack village, ... solution of all problems relating to economic and public affairs of a Cossack village with a definite way of their accomplishment... when Cossack village assembly’s agreement or permission is required”. Why did our ancestors solve the assigned missions successfully and organize their life efficiently and we are not able to do it?

We examined the problem of local self-government inefficiency, having used signed digraph as a model.

For convenience of the analysis and statement, our digraph contains small amount of variables, relating to the problem and includes the most important direct connections. Selection of the parameters is conditioned by the results of the studies pursued by the author in 2011-2013.

The following parameters were taken as vertices: efficiency of local self-government, complexity of municipal unit as a system, population, quantity of municipal officials, professionalism and qualification of municipal officials, living standard in municipal unit, self-definition of local population, people's confidence in government, community relief.

Efficiency of local self-government is a criterion which is calculated according to some stated parameters on the base of state and municipal statistics data. But social characteristic of this phenomenon lies in acceptance of local government legitimacy by local population. That is a perspective of our study.

Living standard and quality of life are indices of common social effectiveness of municipal administration. Living standard is understood as consumption level of material values (security in industrial products, food, housing, etc.).

Complexity of an object can be spoken of, when it was described as an organization, system, or structure according to its level. Describing municipal units as an object of our study, we will estimate it as a system from the viewpoint of its complexity.

System will be seen as an organization – i.e. totality of various elements, diversity of “ordering relations” and variety of ties among them – forming integral unity and having common operational goal [9]. Definition *complexity level* is introduced in order to range multiplicity of this or that object. It can be expressed through quantity of diversity, i.e. quantity of elements of this or that kind, their connections and interconnections, “ordering relations” among them. Municipal units as objects are different from each other according to their level of complicity.

For municipal unit diversity can be defined by population, quantity of settlements included in its structure, by land area; by quantity of functions performed by local administration, thus, by quantity of municipal officials; by quantity of economic industries and quantity of enterprises representing this or that industry, by production output of the industries and quantity of workers employed on the enterprises and so on.

For determination of diversity and, thereafter, complexity, population of municipal units was also taken as a parameter. The basis for usage of the index is its factor loading (0,617) during factorial analysis of the index system, characterizing the condition of socio-economic development of the municipal units in Zabaykalsky Krai. Notice, the chosen index of quantity of municipal officials also has high factor loading (0,738) [10]. Pursued by the author, dynamic analysis of the basic criteria – population – indicates significant population reduction in the municipal areas of Zabaykalsky Krai as a reaction to current processes in the country, including events of crisis character [11].

Results of municipal administration are reflected in the condition of municipal economy and public welfare in social and cultural spheres, in social security (public order) and other aspects of municipal unit's existence. The population as a whole and each resident in particular have their opinions about rationality of municipal administration efficiency. That is why we introduce to our scheme such vertices as self-definition of local population, people's confidence in government, community relief.

According to the studies, published by the author [12, 13], it was find out that there was a strong interconnection between social definition indices and existence of development prospects for the municipal unit, wiliness of the fact that their children and grandchildren should reside in that place and operation estimation of local governments in Zabaykalsky Krai. 21.1% of the pollees are sure in existence of prospects for their municipal unit, 42.3% feel hopeful about the future, 31.0% doubt in development prospects and only 1.4% do not see any prospects.

Signed digraph for study of local self-government efficiency problem is represented on Figure 1.

AB edge has + sign, as high efficiency of local self-government provides solution of all local problems, satisfaction of local residents' needs in work places, consumer goods and services, security and personal fulfillment. The higher local self-government efficiency level is, the higher living standard and quality of local population life are and vice versa – low living standard results in ineffective operation of local government. BF edge has also + sign and strengthening effect: high living standard provides stability of demographic processes, attracts immigrants to municipal unit territory increasing population of its residents.

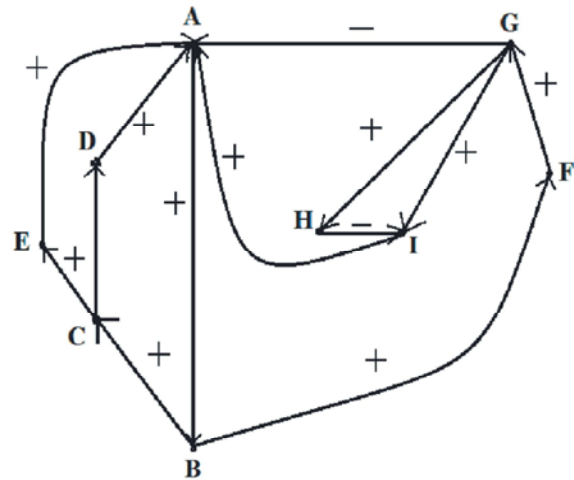


Fig. 1: Signed digraph for study of local self-government efficiency problem

A- efficiency of local self-government, B - living standerd, C- self-definition, D- people's confidence in government, E- community relief, F- population, G- complexity of the system, H- quantity of municipal officials, I- professionalism of municipal officials

Considering population of municipal unit (F) as criterion of system complexity, we get strengthening, positive effect of population growth on rise of system complexity level (G) of municipal unit as an administrative object and , simultaneously, rise of municipal officials, because population growth causes formation of new tasks and problems. GA edge is negative, since, all others conditions being equal, system complexity diminishes efficiency and system complexity diminishing helps to increase system operation efficiency.

GH and GI edges are labeled with positive sign, because system complexity rise of an administrated object causes both growth in quantity of municipal officials and advance of their qualification and professionalism. From the other hand, system complexity diminishing should lead to quantity reduction of municipal officials due to decrease of responsibilities and to their qualification characteristic degradation. It will happen because of deterioration of the competitiveness among officials. Strengthening effect of the back loop is moderated by “-” sign of HI edge, since advance in qualification and professionalism of municipal officials should reduce their quantity for the same set of functions and responsibilities. Positive effect of qualification and professionalism advance, doubtless, will lead to efficiency increase of the

whole local self-government system. Professionalism characteristic degradation will result in inefficient decisions and low efficiency of local self-government system. The back loop of the graph defining an impact of such factors as complexity, population, quantity and professionalism of municipal officials has strengthening character as a whole (it contains even number of negative edges).

Another back loop defines influence of such factors as living standard, self-definition of local population, people's confidence in government, local community relief. All of the edges are characterized as positive and as a whole the loop has strengthening effect. High living standard provides satisfaction of residence and it means that it will result in high positive self-definition of residents as "local", "friends"; in its turn that fact is reflected in people's confidence in government and community relief.

Adduced signed digraph represents a detailed and reasonably accurate model of local self-government system in its social aspect and signed impact in a municipal unit system. We distinguish subsystems, strengthening the diversion. In our case both of the loops have strengthening effect. For this reason the system is considered to be unstable.

One of the lacks of the used method is its simplification: signed digraph model implies all the influences being equal in their force. But that effect of some variables on the others can be characterized by different force. In David R. Heise's *Casual Analysis* it is emphasized that only a few interesting phenomena in social sciences depend on the reason. Social phenomena usually include variety of events, tendencies defined by several factors. Moreover, each criterion influences on several number of other factors. It causes formation of casual dependence net, i.e. causality has a system character. "Causality gives birth to event model and study of the models can provide understanding of casual dependences, which were the reason of the model formation".

For example, changes in living standard have more effect on self-definition of population, than on changes in its quantity. So, it is well founded to label edges with different weight $w(A,B)$, that leads us to weighted digraph. Such a weight is interpreted as a relative force of influence and can be positive or negative. Moreover, establishment of function dependence (where it is possible) enable us to proceed to system dynamics.

With references to estimation of current situation, sign analysis of the model, starting from any vertex, gives strengthening negative effect and, as a result, low efficiency of local self-government.

The introduced model makes it possible to explain conditions for effective operation of Cossack public administration in Transbaikal. In the end of XIX century population of Russia was stable with high birth rate and migrations of Cossacks were regulated. Cossack villages – territorial units – were homogeneous in their functions, but different in population which determine "representation" in authority. The proportional system was used. Current administration was carried out by several officials: elected Cossack chieftain, his assistants, treasurer and trusted agents. Besides, on the level of public administration there was Cossack village court. Professionalism of managers was provided by the conditions of elections or appointments. Right to vote and to be elected was given to persons who shall have attained to the age of 25 and shall not be deprived of the right by one of the enumerated reasons. Candidate for Cossack chieftain and judge shall have attained to the edge of 33 and been in civil or officer rank. Participation in election was a duty and money sanctions were imposed for default on it! Eligibility also could not be denied without reasonable excuse – if people trust you, you should be in service! That leads to high level of self-definition of Cossack village residents, local people's confidence in government, responsibility and service for society.

CONCLUSION

Sign model helps to expand the hypothesis about processes in local self-government system: first of all, in current conditions effectiveness of local self-government depends on level of self-definition of residents and qualification of municipal officials. It is these digraph vertices that should be determinative for changes in a situation. One of the ways to resist low efficiency of local self-government is to transform a loop of the digraph into opposite one. That can be done through changes of some edge signs. Such transformations are carried out through definite state and municipal policy making. For example, municipal staff policy, providing high level of qualification and professionalism will give a chance to change sign and influence of HI edge, thus, GHIA loop becomes restraining and leads to stabilization of the

system. Variant of self-definition level transformation provides an opportunity to change the sign of BC edge that requires revival of responsibility and service for society in the consciousness of residents toward place of their living. Process of local identification in municipal units becomes necessary in the conditions of effective local self-government operation.

Considered method of social phenomenon analysis in the form of signed digraphs enable us to study the problem schematically and visually, to simplify the situation saving only significant variables and their interconnections. Such a simplification does not lessen opportunities of the model, providing quite strong conclusions, hypothesis detailing and elaboration of solutions. Moreover, signed digraph model has perspectives of further development with introduction of new vertices, estimation of functional dependences and elaborated analysis of the problem.

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