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### **Autopoiesis of the innovation group (team)**

#### **Abstract**

The article explores the activity of an innovative team, formed as a specific functional group. Specifically, this project addresses group formation and its activity through the theory of self-organization (synergetics) and autopoiesis. It is shown that autopoiesis is a three-phase process that determines the functional state of the team and that a synergetic approach to group formation allows for the analysis of the team self-organization. This approach reveals the peculiarities of a group's role structure and it informs about the concept of a functional innovative group. This article is based on the theory of social communities, presented by P. Bourdieu (1990), J. Woodward (1960) and the study of social teams by D. Boddy and R. Paton (2002). The article does not consider the idea of G. Hofstede who compares individualism and collectivism as characteristic features of the organizational culture of different countries (1994). The article uses the methodological approach of synergetics as a general theory of social organization. Special approach to the study of social transformations, the correlation of self-organization and management in social systems is applied. A research model of the innovative team activity headed by an actor as a generator of new ideas is shown.

**Keywords:** social group, innovation, functional team, autopoiesis, role structure, synergetics.

**JEL CODE:** A14.

### **Autopoiesis innowacyjnych grup (zespołów)**

#### **Abstrakt**

Artykuł omawia działalność innowacyjnego zespołu, utworzonego jako specyficzna grupa funkcjonalna. Projekt bada tworzenie grupy i jej aktywność poprzez teorię samoorganizacji (synergie) i autopojezy. Autopoeza jest procesem trójfazowym, który określa stan

funkcjonalny zespołu a synergetyczne podejście do tworzenia grupy pozwala na analizę samoorganizacji zespołu. Podejście to ujawnia specyfikę struktury roli grupy i informuje o koncepcji funkcjonalnej grupy innowacyjnej. Artykuł ten opiera się na teorii wspólnot społecznych przedstawionej przez P. Bourdieu (1990), J. Woodwarda (1960) i badaniach zespołów społecznych D. Boddy'ego i R. Patona (2002). Artykuł nie uwzględnia idei G. Hofstede, który porównuje indywidualizm i kolektywizm jako cechy charakterystyczne kultury organizacyjnej różnych krajów (1994). Artykuł wykorzystuje synergetyczne podejście metodologiczne jako ogólną teorię organizacji społecznej. Stosowane jest specjalne podejście do badania przemian społecznych, korelacji samoorganizacji i zarządzania w systemach społecznych. Przedstawiono model badań innowacyjnej działalności zespołu kierowanego przez aktora jako generatora nowych pomysłów.

**Słowa kluczowe:** grupy społeczne, innowacja, zespół funkcjonalny, system autopoietyczny, struktura roli, synergia.

## **Introduction**

Functional teams that ensure the introduction of innovations in the economic, political, sociocultural spheres of society receive presently a wide organizational recognition. Innovative teams routinely appear with the aim of creating large business and industrial projects. The practice of group-formations is not widespread and requires theoretical comprehension especially when it comes to the concept of functional innovative group formation, the features of organization and self-development, and the principles of activity.

The aim of the article is to analyze the formation and development of functional innovative teams from the perspective of self-organization (synergetics) and the autopoiesis of group activity. Historical practice shows that the effectiveness of any activity is determined not so much by the efforts of an individual but by the effectiveness of the cooperative work of the group.

Our hypothesis is that the effectiveness of autopoietic group innovation depends on how fully involved its members are in terms of their roles with regard to the professional activity. The formation of the role structure of a group is a part of a global social process called the socialization of the individual in a specific community. Socialization is the kind of role coordination of an individual within an organization or a community produced when a person's status changes from a novice to an adapted permanent member (Akulich, Kaźmierczyk 2018, p. 238). If the organization manages socialization correctly, people adapt

more easily, become part of the team, and get on well with each other. The winning organization is the one that gets interested and highly qualified team members.

According to the common definition of D. Boddy and R. Paton, it is possible to consider terms “group” and “team” as synonyms meaning one semantic unit that consists of two or more individuals having common goals, performing different duties, depending on each other, coordinating joint activity and treating themselves as part of a single whole (Boddy, Paton 2002, p. 297). According to O. Comte’s works the functional differentiation of a social organism arises on the basis of social division of labor and solidarity (Mill 1961). On this basis, it is possible to single out various social communities, including innovative teams. H. Bloomer studied the community from the point of view of macrosociological approach. P. Bourdieu studied it from the point of view of the structural approach (Bourdieu 1990). P. Sztompka, who studied society as a specific population with many social communities, considered the process of the formation of social groups from a variety of individuals. According to Sztompka, an innovation team in this meaning has some set of individuals (Sztompka 2005, p. 187). N. Smelser notes correctly that the word community has many shades of meaning and therefore it is almost impossible to provide a precise definition of this concept (Smelser 1994, p. 244). He argues that a social community should be conceptually considered as two meanings. The first meaning is associated with the idea that people living next to each other participate in everyday collective life. The second concept indicates the feeling of belonging to a certain group (the same place of residence, study in the same educational institution, job etc.). V.A. Yadov draws attention to the fact that the system of society organization means “the organization of diverse social communities, social actors that realize their interests at a given time and in the historical perspective” (Yadov 1995, p. 19, Silin 2018). We define a social community as one of the central categories of modern sociology. It is a stable integrated set of people, having common features in all or some aspects of their living conditions, consciousness, social norms, interests, and values. This definition of social community helps to understand the essence of innovative groups (teams) and determines specific approaches to its study. We use theoretical materials provided in EBSCO and ProQuest databases. We seek to define the basic concept of our subject of research: “group” or “team” and the types of social communities associated with project development, including innovative ones. The process of group formation, and the accompanying development of group role structure is not possible without mastering the culture of organization. We think that the functional team typically focuses on modernizing

new products. The autopoiesis of a functional innovative team, which strengthens the unity of the organization as a system. It contributes to the growth of competition that ensures the selection, control and limitation of functions.

### **Types of social communities**

Society consists of successfully co-existing diverse social communities classified into different types. Professional social communities include individuals engaged in the same professional activity - lawyers, economists, sociologists, biologists, etc. "One of the forms of professional communities is labor collectives, business units, professional teams, both united and divided in production technology", as said by J. Woodward in the mid-1960s (Woodward 1960, p. 328). Completing a half-century scientific research of the best management area, she was the founder of the theory of situational management (contingency approach).

The development of the theory and practice of management in the Russian market economy revived interest in the category "group" at the new theoretical level. A group community or social group is a set of individuals who are related to each other and participate in a certain activity, having stable spatial, local and temporal certainty, common values, interests and goals. The individual is involved in social relations and relations through group integration. R. Merton devoted much attention to these processes, considering social groups from the position of self-identification and identification, moral principles of the forms of internal interaction. In a broad theoretical context, a social group is considered from the point of view of a stratification approach. Analyzing the very small "group", Merton defines it as a set of people who interact with each other in a certain way, exercise their belonging to the group and consider themselves members from the point of view of others (Merton 2006, p. 434). In the process of applying his theory of collective actions to the analysis of the economic development of specific societies M. Olson concluded that small lobbyist organizations and coalitions are more influential and effective in the influence on the economic growth of the country than large groups or communities (Olson 2013, p. 324). At present, the professional activity of innovation groups has acquired a new character associated with the development and implementation of various kinds of projects, including innovative ones, which involves the formation of functional teams with profound professional differentiation.

### **Group socialization and the process of a group formation**

The secret of managing socialization in enterprises is to provide new workers with information about the organization, work, and members of the team. Socialization increases the communicative opportunities of the members and helps them master the organizational culture in general. The experience and activities of the groups help to form the organizational culture, while the norms of the groups help to spread it. This process contributes to the self-organization of small social communities (Armstrong 2004, p. 285). The diversity of such groups is quite large. The following are the main components of the possible typology: the functional group, the task group, special task group, an informal group and even a neurotic group. To perform non-standard tasks, organizations usually ask special groups: committees and working teams.

In a crisis economy “Interdisciplinary” teams appear. When solving critical situations a formed team, includes employees of the administrative and management staff and representatives of civil society. The model approach is increasingly “working”, the example of which is the B. Tackman’s model assumes two main spheres of group activity: business and interpersonal (Tuckman 1965, p. 384). G. Kelly model offers a model for recording the stages of resolving a critical situation (Kelly 1955). The model of J.W. Newstrom and K. Davis provides a model of the formation stages and activity of the team: forming, storming, normalization and decay (Newstrom, Davis 2000, p. 329).

Different types of groups formed in the organization go through the same stages. The process of passing through these stages is different for each individual group. The transition from one stage to another does not always occur without conflict. Like an organization as a whole, the group has its own life cycle. The motivation of the members of the group significantly decreases in 5 years period of activity and the group is ready for disintegration, if the purpose of the activity does not change. It is clear that the most important factor is always the objective function, which can shorten and lengthen the life cycle of the group.

### **Role structure of the group**

One of the most important factors in the development of the group is its role structure. The process of group development is based not only on the stage of the life cycle, but also on the process of the stage “aging”. The groups begin to acquire the following four attributes of the mature group: role structure, standards of behavior, cohesion and informal leadership in this process. Each member of the group has its own function, the role it performs in order to help

the group to achieve its goals. The role structure of a group is a set of certain functions and relationships between these roles accepted by the members of the group. At each stage of the deployment of a joint activity scenario, these role functions can end in a failure. Violations, disruptions in role-playing activities can lead to confusion of roles and sometimes personalities conflict with assigned roles. The main reasons leading to redistribution of roles are as follows: role duality, role conflict and role congestion.

The role duality means that the functions and tasks of this role are not clear. A person does not know what is required of him. Role conflict occurs when the messages, hints addressed to this role are clear, but the tasks required are contradictory or mutually exclusive. There are several types of role conflicts. An inter-role conflict is the simplest and most frequent. Sometimes individuals are asked to fulfill contradictory demands coming from different sources. Finally, the person doing the assigned task may get clear but contradictory task. The contradiction between a person and a role occurs when someone wants to do something unethical or illegal. Role overload occurs when the duties imposed by this role on a person exceed his capabilities. It happens also when a person consciously assumes the performance of too many roles simultaneously.

Each mature group has its own norms of behavior. A norm is a standard of behavior accepted by a group for all the members. These norms determine the boundaries of acceptable and unacceptable behavior in a group. A special quality is the unity of the group. It means the level of loyalty and loyalty of members to their group and to each other. In groups with a high degree of cohesion, team members work together, support and trust each other, and, in general, achieve their goals. It is important to know the factors that increase or reduce the group's cohesion. The main factors that increase (or reduce) cohesion are as follows: competition with other groups, interpersonal attraction, favorable evaluation of the group from outside, unity of purpose, frequent interaction. Factors destroying cohesion are as follows: a large number of the group members, different goals, rivalry within the group, domination of one or more members of the group, and negative experience of group activity. The result of cohesion and compliance with the rules of role behavior is to increase the group job productivity. We get a high overall efficiency of the group's activity with high cohesion and the implementation of role norms.

### **A functional innovative team**

A functional innovative team is a specific social community that meets all the requirements and characteristics of a social group, which at the same time has its own characteristics in comparison with other social groups. What is the main difference? D. Katz and R. Kahn mention that the role set in the group is determined by the members' work (Katz, Kahn 1966). We believe that roles are characterised by "how the work done". The competencies the members of the functional innovative team possess are determined by the tasks and the system of the innovation cycle. Our research model is based on the ideas of N.I. Lapin who determines the following profiles: 1) nomination of innovative ideas (actors); 2) co-authorship; 3) technical modeling; 4) prototyping; 5) marketing (Lapin 2010, p. 58).

Thus, a functional innovative group is a self-organized team with role functions for inventing, developing and the diffusion of an innovative product for the development of an organization or society for an indefinite time. In the organization, a functional innovation group can focus its efforts on modernizing production, management and communication and creating a new product. In society, examples of innovation activity of groups are observed in the most diverse spheres: politics, economy, culture (at the state, federal and municipal levels). In general the innovation team is "a group of people who share a common feature and performs socially necessary functions in the overall system of division of social labor" (Golenkova, Akulich, Kuznetsov 2005, p. 245).

### **Synergetics and autopoiesis of a functional innovative team**

Self-organizing social systems form a closed social space defined as a phase in synergetics. A phase is a homogeneous part of the medium (substance) separated from the rest of the medium by the interface. Phase space is a part of the environment in which the system adapts its elements to itself and has a certain number of patterns of behavior available to the system. Phase space has universities that create a landscape of professional education in the region, a zone of scientific research, international cooperation, academic mobility, publishing and social activities, and a cultural landscape around them. Socialization, institutionalization and legitimation are considered to be the basic features of autopoiesis (self-creation and self-generation are the terms introduced by U. Maturana) ensuring the reproduction and sustainable development of the organization (Maturana 1981, Kicherova, Efimova, Khvesko 2014).

Socialization provides a “recruiting function” as preparation and inclusion of individuals into the reproduction of previously formed structural elements and relationships that are included into this group. This process is able to correct organizational behavior, directing it either to maintain established structures or to create new ones. Mechanisms of legitimization provide support to those role patterns by the members of the group that correspond to the values that dominate in the organizational culture, reinforcing their interest in reproducing the norms and logic of group relations, thereby strengthening the integrity of the organization as a system. Socialization, institutionalization and legitimation estimated in communication processes in the practice of real organization research. Thanks to such mechanisms, human actions are included in the norms of the system and the main task is to maintain the integrity and stability of the organizational structure, its dynamic balance. Diffusion of these concepts in the communication processes leads to the desire of individuals to obtain the appropriate roles that ensure stability. At the same time, it contributes to the growth of competition, which ensures the selection, control and limitation of functions that go beyond the status-role and profile standards.

Autopoiesis shown in a three-steps process determines the team’s functional state. The first step (dynamic equilibrium) is ensured by the reproduction of the basic structural elements and functions and the implementation of status-role prescriptions. Thanks to this, uninterrupted work of organizations and groups as its components is ensured, and administrative, cultural and legal norms are observed (the system-normative level of the organization is reproduced). The equilibrium of the system is not constant due to the complexity of its elements and characteristics. The second step (the imbalance of the system) depends on the behavior that does not correspond to the role of norms, the effectiveness of the sanctions applied, and the chaotic management. Such a mismatch of internal structural links is fraught with serious consequences for the system if it becomes too large. To restore equilibrium an organization must have management and social mechanisms to overcome structural disorganization. The third step is a new dynamic equilibrium: its steady state. The system emerges from the state of chaos, the interactions are ordered, and norms are observed. Communication is the main operation that provides an autopoiesis of the system that delimits it from the outside world. Its main property is sociality “... it can only be reproduced in a recursive connection with other communications, i.e. in the network of communications, in the reproduction of which, each individual communication participates independently” (Luhmann 1982, p. 215).



## Conclusion

We concluded that the analysis of the functional innovative team conducted on the basis of autopoietic approach allows us to identify the main principles of group activity and its organizational features. We point out that the empirical analysis of the functional group is largely based on the role structure of the group. The direction of the research has changed: instead of “how the work is done”, we emphasize “what is done” by each member of the innovative team. This change proves to be highly fruitful because we have built a systematic model of a functional innovative team that consists of actors of ideas, co-authors of ideas who make technical modeling, prototyping and marketing innovation. The autopoiesis approach proves that such a model is characteristic not only for organizational structures, but also for the regional society as a whole, when autopoiesis ensures the self-reproduction of the groups with changes of elements within the system as the perspective of future development processes. Our contribution to this literature is that for the first time we analyze the formation and development of a functional innovative team from the standpoint of self-organization (synergetics) and autopoiesis of the group activity and proved the effectiveness of the innovative team activity in professional tasks performance.

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