

**GCPMED 2018**  
**International Scientific Conference "Global Challenges and  
Prospects of the Modern Economic Development"**

**DYNAMIC MANAGEMENT SYSTEM FROM THE STANDPOINT  
OF THE SYNERGISTIC APPROACH**

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***Abstract***

The contribution reveals that the methodology of the synergistic approach considers the organization as an artificial system, which is an integral part of the world. At the same time it is necessary to take into account self-management processes in this system at the maximum level. According to the principle of self-management of complex systems, an organization as a complex system has the ability to manage and restructure itself, while the external influence is necessary only to initiate the desired trends of its self-development. The authors suggest considering the concept of self-management to a greater extent in “soft” systems and prove that fractals are self-managed structural units. The features of “soft” management systems, a distinctive feature of which is the presence of horizontal (staff) relations in the organization, are given. The activity of a profit-oriented business in a competitive market is disclosed and its influence on the economic system is revealed. In addition, the authors consider the synergistic theory of fractals or fractal factories, as well as an approach to the reproduction of organizational relationships, based on the concept of a “training organization”. The authors identify the distinctive features of a new type of employees and requirements for their skills. The contribution describes the basic features of rational self-management, highlights the prerequisites for its development and defines the conditions for its formation and development.

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**Keywords:** Dynamic system, fractal factory, profit oriented business, synergy, synergistic approach, self-management.



## **1. Introduction**

At the present life stage of the modern information society, the issue of forming an effective management system remains the most urgent. To date, there is an urgent need to develop a fundamentally new approach to understand the insights of the management system. In the framework of this contribution, a scientific search for the most optimal management system is carried out from the standpoint of a synergistic concept.

## **2. Problem Statement**

At the present time, the ideas of synergy are widely used in various fields of science. New directions are emerging, based on the principles of self-management, in such sciences as biology, psychology, corporate theories and others. Fundamentally, synergy is the beginning of the synthesis of various scientific theories and applied disciplines. The management system follows the laws of movement and development and characterizes the organization's ability to self-development through self-regulating, the criteria for its development are synergistic effects caused by the integrated system.

The synergistic approach, its formation and further development, had a significant impact on management disciplines.

Within the framework of the management theory, the synergistic concept is based on the idea of introducing attractors, which are attracting invariant manifolds. Such attractors, or in other words, synergies, contribute to the formation of in-system dynamic links, due to which coherent collective motion appears in the phase space of the system. And this, in turn, is a prerequisite for the implementation of the target (guided) self-management.

## **3. Research Questions**

The main research questions are the following:

What is the essence and methodology of the synergistic approach?

What are the essence and principles of the concept of self-management?

What are the features of "soft" management systems?

What are the features of a dynamic management system?

What are the features of the demanagerization process?

## **4. Purpose of the Study**

The purpose of the study is to analyze the dynamic management system from the perspective of a synergistic concept.

## **5. Research Methods**

### **5.1. Synergistic approach**

The synergistic approach is focused on the study of self-management insights of complex objects in a chaotic spontaneous structuring.

The methodology of the synergistic approach considers the organization as an artificial system, which is an integral part of the world. At the same time, it is necessary to take into account basic self-management processes in this system at the maximum level. Over time, particular attention was paid to self-management processes in the organization, since they can improve the management and efficiency of the system as a whole and, as a result, maximize its potential (Andresen, Koller, & Schulte, 2016). Thus, the idea of self-management had a significant impact on the formation and development of modern management concepts. In addition, attempts to introduce the ideas of self-management into the framework of a real enterprise are actively implemented in the practice of modern management.

The emergence of the self-management theory in modern science is caused by economic and social changes in the modern world, which, in turn, are caused by scientific and technical development and high dynamics of changes in the external and internal environmental factors of the organization (Gaisina, Barbakov, Koltunova, Shakirova, & Kostyleva, 2017).

## **5.2. The concept of self-management**

At the present stage the concept of self-management continues to develop under the influence of the following factors:

- Accelerated market processes;
- Management borders are gradually becoming blurred;
- Horizontal management systems are actively developing;
- The role of the human factor in the organization's activity (Pashkus, Pashkus, & Bulina, 2014).

In the framework of the traditional approach to corporate management formulated by classical and scientific schools of management of Frederick Taylor and Henri Fayol, the result of an external management action is presented as an unequivocal consequence of the efforts made, in other words, the management action entails the desired result.

In accordance with the principle of self-management of complex systems, the organization as a complex system can manage and restructure itself, while the external influence is necessary only to initiate the desired trends of its self-development (Silva & Guerrini, 2018). The efficiency of the management action on a nonlinear system is achieved only when such an action is consistent with internal properties of the managed system. When acting on the system at the right time, you can disclose its forms and structures. From the standpoint of the principles of the synergistic concept, the system has to be built and initiated, and it should have its own development pathway.

According to I. Prigozhin (Prigozhin & Stengers, 1986), a complex system, elements of which are deprived of freedom and their behavior is unambiguous and unidirectional, does not develop and eventually collapses. Directional progressive movement of the system is possible only in conditions of randomness and independence of behavior.

The concept of self-management is perfectly illustrated in "soft" systems. Systems of this kind are business organizations. According to Schumpeter (2011), the main task of such organizations is to implement innovations. It is an independent organization that does not have long-term relationships with other market actors, and its behavior is due to temporary interaction in order to implement innovations.

The activities of a profit-oriented business in a competitive market have a significant impact on the economic system:

- First, its activities “swing” the economic system, bring it out of balance and change the conditions and rules of economic activity;
- Secondly, the least successful organizations that are not able to meet competition are absorbed by the most successful innovative ones, and as a result, the structure of the market and the system of its functioning change.

Such conditions contribute to spontaneous transition of the system from no equilibrium to a more equilibrium state. The idea of spontaneous transition, used in the concept of self-management, explains the reason for the refusal of organizations from vertical administration in favor of soft management systems.

### **5.3. “Soft” management systems**

Describing “soft” management systems, it should be noted that they mainly use horizontal (staff) communication. While vertical (linear) links are based on hierarchical coordination, horizontal links allow you to effectively interact with different parts of the system.

Having horizontal links allows streamlining the coordination process and saving time on decision making. Informal relationships, which are not regulated and arise spontaneously with the interaction of employees when performing their individual functions, are of particular importance in horizontal relations.

On this basis, the development of a significant number of horizontal links in organizational structures contributes to the development of self-management processes in the system.

The activity of business organizations is focused on growth, while largely relying on available opportunities rather than on available resources (Honchar, 2015).

The implementation of these opportunities is carried out in stages, management over resources is carried out sporadically, and the management structure is flexible and has a small number of levels of hierarchy. The performance of this organization is more expedient to estimate on the basis of efficiency than on the basis of productivity. Unlike traditional organizations, built on vertical coordination, the basis for building a profit-oriented business is an individual initiative (Espejo, 2018).

### **5.4. Dissipative organizational structures**

In current conditions, dissipative organizational structures of organizations are developing more and more actively, including matrix, echocratic, participative, network structures. The foundations of these organizations are decentralization of management, polycentric distribution of powers and informal connections, which together form not only the autonomy and independence of employees at a high level, but also their effective cooperation in the performance of official duties, and the result is self-sustaining and development of the organization. At the same time, it should be noted that rigid hierarchical structures often form temporary target groups created for a certain period of time in order to solve specific project tasks. For example, there are scientific groups that perform routine daily work in a centralized

mode, and they switch to a free collegial cooperation mode in order to solve innovative problems (Kurka & Pitt, 2017).

Thus, in practice there are all sorts of alternatives and combinations of transformation of structures for the survival and development of the organization.

### **5.5.Synergistic theory of fractals or fractal factories**

In the context of self-management, the theorist of management science (Warnecke, 1999) developed a synergistic theory of fractals or fractal factories. The nature of the “fractal factory” is determined not by its external features, but by internal values and organizational culture. A fractal is an independently operating structural unit of the organization. Each fractal has its own task, which is not regulated in any way and is determined in the process of the system functioning. As a rule, fractals appear randomly and spontaneously, self-rearranging and disintegrating. To serve the whole, they are able to group together without any external pressure. That is, fractals are self-managed structural units. It is self-management that allows good ideas to be fulfilled regardless of the place and time of their appearance.

The Fractal Factory also performs a centralized function: all fractals are provided with all the available information and all the resources that are necessary to solve the tasks. At the same time, important requirements for a “fractal factory” are: first, all its departments and all employees should have entrepreneurial thinking; secondly, each fractal must be a smaller fractal factory. That is, several so-called sub-enterprises (fractals) operate within a single enterprise (“fractal factory”).

Due to a high level of its own dynamics and the ability to quickly and efficiently respond to changes in the external and internal environment, the “fractal factory” achieves the closest possible interaction between self-management fractals. Each fractal and each workplace are represented as a whole enterprise, a specific goal is implemented in a comprehensive manner, and a separate task is solved independently. The general tasks of the system are performed locally, and the general goals of the “fractal factory” become specific functions of a certain fractal. But at the same time there is a requirement for forbidden contradictions between the goals of a separate fractal and the goals of the system as a whole. Goals are generated, corrected and coordinated between participating fractals so that the goals of individual fractals do not contradict each other. Such homogeneity of goals is the key to effective use of human resources in the “fractal factory”.

Organizations built on the principles of a “fractal factory” form a communication structure, which has wide autonomy. This structure is managed by employees, but in turn it controls them. Managers do not have complete control over their employees, but only set certain goals and tasks.

In this way, the stimulation of organizational principles of employees and cooperation processes between them gives the “fractal factory” the ability to manage itself in such a way that the joint cooperation of all departments and employees of the enterprise gives the highest positive effect. It should be noted that tasks change under this management. If input and output of the system are closed on each other, then the system is forced to switch to self-development mode, and its goals are no longer the main management criteria. In this situation, management is required to create optimal conditions for self-management and maintenance of self-development.

Many practicing managers and theorists of modern management science are increasingly expressing the idea of obsolete management principles that have been in power for quite a long time, and as a result, the need to update the theoretical framework that can solve the issues of management and functioning of open computerized enterprises integrated with the external environment.

At present, practitioners follow the functional approach, but in current conditions it is very limited. For example, often the output is less than the costs necessary to achieve such an output, since the costs of matching and permitting procedures in a hierarchical structure are quite large. Functional management relies on hierarchy in decision making and management, which, in turn, drives all business processes into the framework of the existing structure. But after all, the organization that we consider to be an objectified structure should not slow down business processes.

Russian scientist Prikhod'ko (1999) proposes to consider a modern organization as a system, the main elements of which are all kinds of workflows (business processes). That is, the organization is represented in the form of a dynamic system that has its inputs and outputs. At the same time, external inputs and outputs provide interconnection with the external environment, and the main business processes are located within their borders. This way they can be called first-order business processes. In addition to this, there are workflows inside the organization, the goal of which is to provide basic business processes, or business processes of the second, third, etc. order. Such flows also have their boundaries, inputs and outputs.

The nature and content of both the core and supporting business processes are determined by problems facing the organization, since the organization itself essentially becomes a decision-making system. Within the framework of this approach, the organization's activity is not based on the achievement of predetermined goals, but on ensuring the stable development of the organization. The functioning of a single element of the organization is provided by a group of professionals who understand the significance of their work for the entire organization (Eskola & Hakola, 2016). Note that the presence of a manager position is not a prerequisite for managing a group. From this point of view, the organization is represented as an "associate employee", and each member of the organization is a kind of personified expression of the organization, its general managerial principle.

## **5.6. Demanagerization**

The main distinctive feature of the demanagerment process is a clearly defined organizational gradient, and it is poorly defined in the main business processes and at the level of the organization as a whole, since it is more developed in higher order sub-processes. In fact, through openness and decentralization, the organization is able to maximize the creative potential of its employees and to ensure the process of self-management. The law of synergy is fully developed under these circumstances.

Prikhod'ko (1999) argues that although managerialism is the greatest achievement of the twentieth century, it will nevertheless be replaced by synergy. In other words, management based on the principle of object – subject will be gradually replaced by the interaction in the organization, its self-development.

Prikhod'ko (1999) uses the concept of "rational self-management" in his works. He analyzes its basic features, highlights the prerequisites for its development and defines the conditions for its formation and development.

The basic features of rational self-management are the following:

- The impact targeted at the management object is lower than the level of fluctuation effects of the external environment;
- Synergistic ideas are the basis for predicting the possible state of the socio-economic system;
- The employee is a personalized expression of his organization. In turn, the organization is presented as an associate employee;

The formation of rational self-management is possible under the following conditions:

- Development of corporate culture to the level of civil society as a whole;
- Transition from employment to a partnership;
- Increasing the openness of socio-economic systems;
- Transition from the target, when the goal is the basis of the organization, to value-based criteria in management.

Prerequisites for the development of rational self-management are:

- Transformation of management functions;
- Restructuring (virtualization and networking);
- Focus on the process approach;
- Increase in the flexibility of organizations;
- Socialization;
- Complex automation of executive and technological functions.

Thus, the following principles are the basis for the concept of self-management of social systems:

1. The organization is recognized as an open system, interconnected and interdependent with the external environment.
2. The system is focused primarily on its own improvement and development, and not on performance.
3. The system is dominated by soft organizational structures that ensure decentralization of power and control.
4. The main value is the initiative of a single employee, his creative approach to work, as well as the presence of management abilities inherent in each person (Kroell, 2010).

The implementation of these principles allows increasing the level of self-management of the system and contributes to the enhancement of synergistic actions in it.

In the situation when the organization is self-developing, the goal and structure cease to be system-forming factors for it, and a new system-forming factor appears - organizational culture. At the same time, the external environment of the organization turns into a space for civilized cooperation and partnership, and the value system comes to the fore.

### **5.7.Managed chaos technology**

The effectiveness of self-management is the fairly successful application of the so-called managed chaos technology, which is close in its content to reflexive management.

The managed chaos technology is very successfully used by Western countries in the struggle with other countries for domination in the global space, while reflexive management was presented by

domestic military practitioners and theorists. These technologies do not imply a direct impact on the object. They mean that such deliberate motives are introduced into the system in a natural way, which as a result provoke the desired reaction and lead to certain pre-calculated consequences, and the state of the system (environment) changes (Oswald, Köhler, & Schmitt, 2018).

For the first time the concept of “reflexive-active environments” was introduced into the scientific circulation by Lepsky (2010). We will get an idea of such an environment by referring to the work of a Gelikh & Knyazev (2007, p.18): “The system is determined by the environment and creates its own environment, which in turn influences the system and constructs it. It is impossible to innovate the system, if you do not change the environment, do not make changes to it, and vice versa.”

From this we can conclude that the system and its environment are mutually active, in other words, the separation of the system from the environment and the merging with it occurs almost simultaneously.

In studying this issue, among other things, there is a need to solve the problem of reproducing the organization as a social institution and preserving its synergistic potential (Kamensky, 2015). When reproducing all social objects, it is necessary to take into account the main skills, knowledge, experience that cannot be transmitted to people by inheritance. You can gain, assimilate and develop them only in the process of long-term training and education in the family, in educational institutions and other social groups.

The Russian scientist Alekseevsky (2003) argues that modern management is a culture of achieving goals that combines scientific methods (such as case studies, decision-making methods, system design), and social technologies and techniques. An important role in the managed subsystem here is assigned to the organizational culture of a particular social institution, which combines not only the personal needs and interests of individual employees, but also the goals and objectives of the organization as a whole. In order to get the desired result within the socio-cultural environment of a particular organization, it is advisable to use: firstly, social technologies (such as communication, information transfer, training, establishing and regulating the rules, norms and technologies of personnel relations), and secondly, various organizational technologies (namely, targeting, functioning, development, self-development, decision-making).

The reproduction of organizational relationships in the organization allows maintaining the potential of its self-development. To do this, it is advisable to use the technology of training management at the organization level, the implementation of which is carried due to management and the socio-cultural environment of the organization. The use of these technologies will allow a new employee to adequately perceive and develop an organizational culture. An employee forms a system of values, orienting him to labor behavior through the organizational culture. In addition, it helps an employee to effectively build organizational relationships, show his personal qualifications and skills, achieve success and career growth, in general fulfill his potential and interests, achieve his life goals within a specific organization.

### **5.8. Approach to the reproduction of organizational relationships**

The considered approach to the reproduction of organizational relationships is largely based on the concept of a “training organization.” This concept is based on the idea that, within the framework of a



training organization, each employee has an established systemic thinking, and a common vision of the strategy and tactics of the development for the entire organization. He is ready for innovation and is focused on the team way of working and training. The main goal of each employee within a “training organization” is to identify and solve problems, while providing many opportunities for continuous experimentation, changes and improvements, and this, in turn, ensures the career growth of the employee, his effective training and achievement of his goals.

It is important to note that the concept of Alekseevsky (2003) is not limited to simple training of employees in the organization, but it is also aimed at the formation and development of a new type of employees. A distinctive feature of a new type of employees is their ability to fulfill their creative potential within the organization, as well as the ability to provide synergistic effects in the organization with close cooperation with other employees. In this case, the management focuses on the self-management principle that each person has and activates it. The following requirements are imposed on the skills of this type of employees (Table 01).

**Table 01.** Requirements for skills of a new type of employees

Skills	Requirements for Skills
Self-determination	Adequate behavior based on the acquired culture of business communication and entrepreneurial behavior
Practical application of acquired knowledge	Ability to use skills and knowledge in practice; A required level of qualification and professionalism with the help of mastered technologies both in a specific situation and in the future
Effective conflict-free communication and behavior	A positive, friendly attitude towards yourself and the ability to form a business atmosphere of mutual respect and social responsibility in the group
Goal-setting and deployment of tasks	Ability to timely and adequately assess the prospects for their activities, their own development and development of their business, taking into account their intelligence, features of character and ability to certain activities
Self-management and interaction	Ability to self-study, self-development and self-realization of their competence, spirituality, responsibility, interests, search for the most economical and effective actions in a particular situation
Achieving personal and group goals	Ability to use the possibilities of the situation, resources, competence, own interests and the interests of other members of the group, to mobilize forces and abilities in each period of life activity
Leadership behavior	Ability to develop and maintain standards for group behavior, to motivate the behavior of members of formal and informal groups, to regulate the psychological climate, to mobilize efforts to achieve common goals and objectives through initiative and other qualities

As you can see, the requirements for skills of a new type of employees who are able to provide, together with other members of the group, self-management and self-development of social institutions (in particular enterprises), are quite diverse and extensive. And, of course, the required qualities of

employees should be formed collectively by all social institutions: family, school, educational institutions of various levels of education, organization and the state as a whole.

## 6. Findings

Today's companies have changed dramatically due to economic and social changes that took place in the modern world over the past decades.

Most practicing managers and theorists of modern management thought declare the need to form a new theoretical base for studying the patterns, mechanisms and tools for managing open computerized enterprises, integrated with the external environment that would adequately and fully meet all the challenges of our time.

Thus, the application of a synergistic approach to management in dynamically changing conditions of information society is substantiated; it is shown that the principles of self-management are practically significant.

New approaches to the study of the organization, the definition of the role of management and employees (the concept of a profit-oriented business, the concept of a "fractal factory") were developed.

Within the framework of the concepts presented, the key to the success of any organization is the preferential provision of its self-regulation, self-management and self-development.

These concepts will allow organizations to maximize their human and resource potential through the law of synergy and synergistic effects.

## 7. Conclusion

Modern management theorists come to the conclusion that it is necessary to form a new management paradigm in which management should sooner or later give up its place to synergy.

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