

# Economic View on Corporation as an Open Socio-Technical System

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## Abstract

The article methodologically justifies a content of corporation model as an open system by comparing of traditional and socio-technical conception of its functional and elemental composition. The problems of organization management system approach in conditions of turbulent external environment are examined. The analysis of the last researches and publications on an interesting subject is submitted.

**Keywords:** corporation, an open system, environment, linear models, strategy

## 1. Statement of the Problem

Concept of corporation as an open system is based on general systems theory. According to system theory all the processes occurring in a real world, phenomena and events exist in the general relationships and interact as a relatively discrete elements, endowed with qualitative and quantitative sides varying in time and space. Therefore consistency is a sign, inseparable substantial property and one of the most important characteristics of a corporation,

Corporations as open systems are considered from the point of view of internal system communication and their communication with the external environment. The system is maintained by flows of energy and materials coming into it from the external environment, and after extending a process of change, they emerge in the form of goods and services. The problem of the management of open systems is that corporations are in dependence on the environmental conditions, providing the means for their existence. Being viewed from a systems perspective, organization management system is effective when the transformation of inputs gives an additional positive effect on the output. If we consider an open system, we should calculate the cumulative effect of the interaction between the enterprise and the external environment.

When an open system is operating in a turbulent external environment, a great attention should be given to the feedback system which is a result of system elements interaction with the outside world.

## 2. Analysis of Recent Research and Publications

N. Gless, J. van Gig, F. Glazl, B. Liverhud, F.Zh. Guiyar, J. N. Kelly, B. Z. Milner and M. MacDonald devoted their works to the research of organization as an open socio-technical system. In particular, F. Glazl and B. Liverhud (Glazl & Livehud, 2000) approach to a corporation as a biological organism, F. Zh. Guiyar and J. N. Kelly (Guiyar & Kelly, 2000) consider the organization is an actual human body. B. Z. Milner lays stress on the complexity of the corporation as a body. However, it is necessary to systematize the published studies, and highlight features of the corporation as an open "live" system.

**The purpose of the article** is methodological substantiation of model content of corporation as an open socio-technical system.

## 3. The Main Material of the Study

There are systems with linear and non-linear feedback in the methodology of open systems. A system in which a certain action leads to an advance predictable reaction is a linear system. A system in which the results of performed actions are less predictable is a non-linear system.

The outside world often changes so that, as opposed to short-term, in the long term it is impossible to predict and fix such changes in the plans of organizations leaders and also to establish a clear relationship between actions and their results. Comparing linear and nonlinear models of open systems, N. Gless (Boddy & Peyton, 1999, pp. 95-96) claims that the modern business world is more nonlinear:

- reality 1. Corporations are complex open systems, which are under the constant influence of the external environment. Management plans are often violated by external processes or internal political and cultural developments in the corporation;
- reality 2. Changes in the environment occur so quickly (there are always new realities and threats) that even the top-level manager does not have time to "feel" what is happening and make a detailed informed decision. It should be also taken into account that the main characteristics of the environment may become different by the time of the implementation of the decision.
- reality 3. Since the simple linear model of cause and effect is inadequate to external environment, so using it management often leads to a completely unexpected (positive or negative) results.

Negative feedback in the linear system is used to return the system to its original position. The difficulty of feedback in nonlinear system is that the results are significantly sensitive to even slight differences in initial conditions. Minor impacts through a series of actions and reactions may be amplified so that the net effect will be totally incommensurate with the original changes. Consequently, return to its original state is not possible in a nonlinear system and the feedback is always positive.

According to the classification by J. van Giga (Wang, 1981), organization as an open system can be considered in the framework of soft systems. If we represent the organization in terms of the theory of soft systems, it can be considered as a social system or organism as an open "live" system. This approach to the study of organizations is found in many research papers (Glazl & Livehud, 2000; Guiyar & Kelly, 2000; Milner, 2004; Milner, 1999). B. Z. Milner notes the particular complexity of the corporation as a body, and believes that it contains "... interests of individuals and groups, incentives and constraints, rigid technology and innovation, absolute discipline and creativity, standard requirements and informal initiatives. The corporation has its face, its own culture and reputation ". (Milner, 2004)

If you systematize the studies you can get the following aspects of the corporation as an open "living" system:

- orientation on the strategy;
- adaptation to changes in the environment and impact on it;
- priority of effective corporation;
- people is the most important resource ;
- management focus on communication;
- democratic management style; self-control, self-discipline;
- only in the public interest action;
- orientation to innovation, etc.

M. MacDonald believes that the application of the concept of the corporation as an open "living" systems requires reorientation to highlight the qualitative composition of managerial influence from "thinking with functions to thinking with processes" (MacDonald, 2000, p. 27). Sometimes authors (Guiyar & Kelly, 2000) compared these processes in a corporation with "life engines " or "bio-corporate equivalents of muscles." Thus they become instruments which should change ideas into concrete action aiming on achieving the goals. Processes are thus interconnectedness and a change in one of them affects all. If processes are formed and aligned correctly and appropriately are managed by system of values and indicators, they establish a smooth system of value creation so that the boundaries of these processes will disappear virtually (Guiyar & Kelly, 2000, p. 164).

General view on organizations was being formed and developed along with the evolution of management theory, the formation of which has a number of historical stages (Glazl & Livehud, 2000; Boddy & Peyton, 1999; Milner, 2004; MacDonald, 2000; Bor, 1998; Vihansky, 2002; Korgova & Borisova, 2001; Kravchenko, 2002).

When forming the management as a science, trends and schools emerged. The authors of these schools, scholars and practitioners created their models independently of each other, in a different context, seeking to different results, so management schools appear contradictory. However, if we proceed from the assumption that the principles presenting in each of the schools allow us to construct a model of the future situation in the control

system of conservancy facilities, all schools of management and research areas may be grouped into management models. In this sense the concept of competing values proposed by R. Quinn is useful. It ties fundamental theoretical developments and relations between them into a single structure cited from (Glazl & Livehud, 2000, pp. 57-63).

The most important characteristic of models classification is the value (both positive and negative) of any processes, activities, facilities for the manager and the employee. Value is interrelated to interest, but the interests of different individuals, groups, the whole staff, consumers and the public do not often coincide. Hence, the values do not coincide. Therefore, models were called models of competing values (Glazl & Livehud, 2000, p. 61).

Schools and scientific fields of management, in accordance with the theory of competing values, give four groups, which are based on different models of: the internal processes, rational goals, open systems, human relations.

Models of rational goals from a historical point of view are referred to the first type. They include the ideas and principles of scientific management schools and management studies (cybernetics). The main essence of the use of models of rational goals is to build improved, more efficient processes.

Models of internal processes, including school-based bureaucratic and classical (administrative) management are referred to the second type. The main essence of these models is to identify the processes of labor in management and production with labor processes in production, using the separation of administrative work on managed objects, functions, tasks, stages, levels of organizational management structure, and to modify repetitive routine tasks in the standard, the solutions results of which are already known or previously planned. The objective of the use of the first type models is to elevate productivity of each individual worker and all of the workers involved in the process of products and services manufacturing, and the objective of the second type is to increase productivity in the management process. Models of human relationships, developed at Harvard School of Management, are referred to the third type. It's an alternative to internal processes models. Whereas the basis of models of the second type is the formalization of relations and connections between the elements of organizational management structure - departments, agencies and managers, models of the third type are aimed at establishing informal ties and relations among members of the same team - managers. In this connection, a set of interests of different groups is considered to use as a model for the integration of human needs with the needs of the business entity and is structured in the form of management goals.

Model of open systems, based on the science of management Research Institute (cybernetics) and the concept of socio-technical systems is related to the fourth type. Feature of these models is their orientation to environmental changes which are caused by a sharp increase of communication links of every business entity with resource providers, target consumer markets, intermediaries, contact audiences, and greater competition in the markets for the manufacturers. Further, these models are developed in the situational management, which focuses on the study, analysis and prediction of changes that occur in the elements of the environment so as to develop timely, relevant managerial solutions on reducing the impact of negative impacts and enhancing positive ones.

All management models were developed at different times in response to the current important problems. However, recognition of this in fact does not mean you must choose new developments only. Sometimes the emergence of new challenges stimulates "fresh" ideas, but their appearance does not exclude the "eternal" problems. In spite of the fact that temporary theories focus on improving flexibility of governmental organizations, finding ways to adapt to changes, it cannot exclude the necessity of control, as required by the circumstances or ingrained way of thinking. Management theory is developing in a circle or spiral, not linear, because "timeless" problems are being added by newly emerging problems. For example, during the transition to open systems model, attention is paid to the speed and flexibility and not to the size of economy on the scale, on integration and not on specialization, on management stimulating innovation rather than control. But such emphasis does not reduce the value of specified priority management characteristics of other models.

All of the above is intended to help evaluate the corporation not only as a business entity, the result of which is to output, and as an equal partner in the process of creating customer value. Consequently, the result, which is obtained as the output of goods and services is a resource qualitatively transformed in internal processes which are characteristics of the enterprise as an open "live" system.

The internal processes that corporation as an open "living" system applies for a qualitative change also serve as an internal resource. According to this logic, the impact of the environment on the function of all participants in the production of a particular consumer values should be understood as an external environment resource which can be used to change the quality of incoming and internal resources. Consumer, whose needs are satisfied by

participants creating some kind of customer value, gets not just a good respectively but a resource that allows him to achieve its goals. The degree of assistance the customer by participants in the creation of customer value, is determined by the efficiency of the entire process. So participants of creating customer value have a common function - transformation and evaluation of inputs according to internal resources. In this context, the user is not an exception. He also becomes a direct participant in the process of creating customer value. Knowledge on using the customer value, which the consumer has and may use for the purposes of consumption, is his internal resource. In the absence of such knowledge, there is often the possibility of adding the resource proposed to the consumer, for example, by means of the establishment of a specific product information support.

At the same time, all the participants creating consumer value must have their internal resource - an information on the qualitative composition of the goods which are offered to the customer. These data must be present in the information accompanying impact. All subsequent steps of quality changes of inputs into an output (via the use of internal resources of a certain participant in the process) bring goods closer to such a state that is necessary for the customer to implement his objectives of consumption.

Systematic approach to the study of the corporation is another major conceptual idea of models of open systems. This approach defines the principles of the methodical construction and analysis of the corporation from several sides (aspects): elemental, structural, functional, integrative, communicative, historical (Guiyar & Kelly, 2000).

Essential elements of corporation as an open "living" system detect elemental aspect, which determines the degree of generality of the system.

Structural characteristics of corporation as an open "living" system (kind of structure, defining communication, quantitative and qualitative relationships) are established by the structural aspect.

The essence of the functional aspect is the justification of functions of corporation as an open "living" system in general and its subsystems. Also the functional aspect brings these functions in line with the purposes of the corporation.

Integrative aspect is manifested in finding out contradictions in the work of the corporation, in developing ways and means to resolve them, in identifying the main link, which maintains the integrity of the corporation as a system and finally in defining the objectives of the corporation as an open "live" system.

So-called "habitat" of the corporation is determined by the communicative aspect. It justifies types of subordinate and coordinating relationships with other organizations and the strength of such relationships.

The historical aspect involves forecasting prospects for the future by studying the history of the corporation, the stages of its development and the current level of it.

The essence of the system pronged approach is the assertion that any organization as an open "living" system consists of seven essential constituent elements: 1) identity; 2) policy, strategy, program; 3) the structure; 4) individuals, groups and climate; 5) individual functions, organs; 6) processes, the general course of business; 7) physical means (Milner, 2004, p. 12).

Various essential elements of corporation are merged into the subsystems which are not opposed to each other but form a "fruitful tension in relationships" that becomes the main engine of corporation development. Attention then is moved from the study of the internal aspect to interaction between internal and external ones. This occurs through the assessment, during which each organization gives authentic response in accordance with its aims and values. (Kurbatov & Naumenko, 2014)

The general sense of systems theory is that, when you create any kind of systems, it is necessary to consider the relationship between their various elements. According to socio-technical concept, corporations are considered as an interdependent system with giving analysis of its social and technical components. The challenge is to integrate them rather than optimizing one of the subsystems. (Kurbatov, Glagolev, & Fursova, 2013)

Socio-technical view on the corporation as a kind of concept of "live" open systems is as follows.

Technical corporation subsystem is connected to organizational and information subsystems through material means of labor used by the organization and also to marketing subsystem. Social subsystem is the human side of the business, its legal issues. (Kurbatov, Naumova, & Kuznetsova, 2013) It partly includes industrial and technical (organizational) and information (management) subsystems: rational selection and placement of personnel; maintenance and regulation of work and rest of staff; coordination of work processes; valuation of labor costs per unit of basic products produced; development of processing activities to stimulate the activities of employees and the introduction of more productive technologies and styles of administration. Environmental problems solved by organization are also of great importance.

Elemental aspect characterizes organizations as socio-technical system in more detail. This approach highlights cultural and techno instrumental subsystems in the technical subsystem of corporation. Means connected with the natural environment are separated to a subsystem of the physical means which form the environmental subsystem.

#### 4. Conclusion

Essential and structural understanding of the corporation as an open "living" system gives the notion that it is an ordered set of elements and subsystems that are dependent and interact with each other, and with a turbulent external environment, forming an integral unity - a living organism. Integral unity of a corporation is a quality trait that distinguishes the organization from the business entity itself and from its environment, determines the methods and features of the corporation in creating customer value.

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