

MAIN ASPECTS OF SYSTEMS AND NETWORK THINKING IN MANAGEMENT

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ABSTRACT

System development methodology has become a prerequisite for understanding the logic of the evolution of the economic crisis and for creating strategies for sustainable development. Systems thinking can penetrate beyond the limits of what appears to be isolated and independent events, and see the underlying structure. This allows managers to recognize the relationship between events, and thus improve their ability to understand and influence the future. The lack of a systems approach, and the lack of analytical capacity, can result not only in the inability to achieve expected results, but above all in the loss of the ability to generate value for the company. This article presents some aspects of the use of systems and network thinking in management.

Keywords: Management, systems, network thinking, business, market.

INTRODUCTION

Today, certain economic and business activities directly cause much more long-term consequences than in the past. The rate of occurrence of such interdependencies is growing. Therefore, systems and network thinking is becoming more important than any other concept. A specific company manager analyzes the operation of their organizational unit (department) from a specific point of view, forms their own notions about the situation, and decides on an "optimal" solution.

Chief executives must, however, regard the company as a single organism in which a particular view is only part of the mosaic. To make a decision favorable for the entire organization, management should have knowledge on the nature of the relationships between functional units and understand how their interactions form integral characteristics of the organization. In the absence of a bird-eye view of the company, management will make irrational decisions which do not allow for the full utilization of the company's internal potential, increasing risk, and causing situations to arise that threaten the future of the organization.

RESEARCH METHODOLOGY

Currently, little research and analysis is focused on the problems of the mechanisms of systems and network thinking in management science. Moreover, there is lack of research and analysis specifying a systems approach to business and economic processes. It is rather surprising, considering the fact that if we take any economic phenomenon or object, regardless of their nature and scale, we see a comprehensive system, the functioning of which is conditioned by the interaction of its components.

Given this gap in research and analysis, the author of this publication has set a target to fill, at least partially, this gap. The subject of discussion in the article is the analysis of the mechanisms of systems and network thinking in the sphere of management. Furthermore, the intention of this work is to show ways of seeing economic reality in the context of a systems approach.

The basic thesis of this study is that the combined use of systems and network thinking in business management allows for optimal use of opportunities for the development of the enterprise. The work has a typical theoretical nature. The method used in this work was descriptive analysis, based on extensive literature studies. The theoretical output referred to in this study, on systems and network thinking in management, come from both Polish and foreign (mostly English-language) literature.

Systems Thinking in Management Science

The need to have an overall picture of the whole situation for effective diagnosis and decision making is deeply engrained in management science. Modern science has developed general principles and methods to such an approach in the study of various objects and phenomena (Rokita, 2011).

A systems approach should be considered with other possible ways of perceiving phenomena to understand its essence. Using Hegel's concept of dialectical triad, knowing the essence of the whole can be described as a sequence of three mutually changing levels of knowledge (Krzakiewicz, 2012, pp. 38-51). The first level (thesis) corresponds to an intuitive, holistic meaning of the object, based on direct experience.

This is the most common way of knowing used in everyday life. It is the method used by talented and effective entrepreneurs who do not have any special training in management. Such an approach may be very effective. However, success is hardly predictable here; it depends entirely on the ability and talent of a particular person.

The analytical approach is the rejection (antithesis) of the individual method of cognition. As part of the analytical process, one has to pay close attention to the structure of the object they are interested in, then dissect it to understand the structure and properties of its parts in order to explain the characteristics of the whole (Ryan, 2011, pp. 34-45).

The systems approach to understanding reality can be seen as the synthesis of intuitive and analytical methods. It rejects any attempts to assume that the characteristics of the whole are the same as the characteristics of its parts, but it takes an analytical approach by taking interest in the internal structure of the object. This approach focuses on the mutual relations which cause the formation of system characteristics.

It should be noted that specialists from several fields of the same scientific discipline often do not understand one another. They use different terminology (concepts), operate in specific categories - in fact, speak different languages. The fragmentation of knowledge becomes a hindrance in the process of its synthesis, which is necessary for a qualitative leap in the understanding of reality, and to obtain relevant scientific and practical results. The multiplicity of data does not give knowledge, unless there are defined regularities that connect them. A wide range of information does not lead to understanding if the ball of

entangled interdependencies does not untangle into a clear image comprehensible to human beings.

The answer to the fundamental question of how to resolve the problem of complexity is provided by the systems approach of modeling. The secret to understanding the system, to be able to see the overall picture, is the ability to isolate the main relationships and interdependencies that determine the specific characteristics of its operation and form its integral characteristics.

Due to the fact that the instability of the environment is caused by the chaos occurring in the market, managers must seek mechanisms to combat this chaos. They often try to counteract chaos by organizing resources in such a way as to make the most skillful use of them, and develop strategies by constructing optimal management models.

A new approach to the openness of systems means that systems behavior can only be understood in the context of its environment. The consequences of this rule are as follows:

1. The system is a set of interactive variables controlled by the actors participating in the system.
2. The environment is a set of uncontrolled variables that affect the system.
3. The boundaries of the system are arbitrary and subjective in nature, determined by those involved in building the system, by their ability and power to control the interactions occurring within it.
4. The behavior of the system in its environment may be more or less predictable (Rokita, 2011).

If a complex arrangement, managed, satisfies the principles of a system, this results in scientific tasks in the form of topics that relate to the behavior of systems and their interaction with the environment.

1. The system is subject to the principle of continuity of function over time.
2. The system is exposed to the rule of perversity (is flexible).
3. Averaged stability over time is applied to the system.
4. Every system has limited stability.
5. The complexity of the processes that the system must implement varies.
6. The delay in system response time.
7. The relationship of cause and effect.
8. The principle of minimal work for the system (Gospodarek, 2012).

Systems thinking enables the use of various approaches in solving problems in a creative way. Combinations of different systems methodologies are created, adapted to the scale and scope of the difficulties faced by managers in solving problematic situations. Selection of the methodology and the way to use it depends on the creativity of managers. Systems thinking, characterized by holism, can facilitate the work of managers (Rokita, 2011).

Systems thinking results in the construction of a specific management system in the company. The management system, together with business processes and strategy, create a mutual and coherent whole, resulting in an effective management platform that determines the development and growth of the company.

The secret to understanding the system, and the creation of the overall picture, is the ability to isolate the main relationships and interdependencies that determine the specific characteristics of its operation, forming its integral characteristics. Systems thinking is an approach that allows one to see and understand the meaning and accuracy of the observed schedule of events so that they can prepare for the future and have a certain degree of influence over it.

A systems approach is the basis of precision in thinking and cooperation. It is a way to know more, farther into the future. The obvious explanations are often untrue, and the truth is not always on the side of the majority. Recognizing another, broader picture, can help managers to better understand phenomena that are occurring, and to act in such a way as to obtain the best possible results in the long term perspective.

Systems thinking is essential in managing human resources more effectively. It helps to understand the complexity of business processes and to identify ways for their improvement. Systems thinking teaches managers how to build teams and how to steer teamwork, as teams only operate properly when they are treated as systems.

Ways of Seeing Economic Reality

A given economic reality – in which change occurs - can be evaluated from different points of view. Managers sometimes get confused by events occurring in close proximity of each other. They are not able to determine the nature of the events and, what is more, to understand their meaning. Exploring and understanding requires a certain temporal distance from the event and seeing it from the proper perspective.

Systems thinking allows its users to perceive reality in different perspectives. It draws attention to the interdependence of events, and how, as a result of their interaction, something bigger and more whole is created. The fundamental principle of systems thinking is the ability to look at events from various perspectives. This is important because reality is much more complex than the notions associated with it. The more ways of seeing, the fuller the understanding of reality (Czarniewski, 2015, pp. 9-16).

Managers may sometimes be reluctant to admit to mistakes and failures. It takes a long time for them to see their errors and begin to question their assumptions about a certain situation. Intentions justify actions. This leads to managers continuing to act in the same way as before, and if unfavorable results are obtained, they tell themselves that they had no intention of getting such results. Systems thinking encourages adequate inquisition into a problem. It promotes a state of mind which tends to question the scheme or model being used, and submit it to verification (Weick, 1995).

Systems thinking examines the situation, and the notions associated with it, as a whole. One cannot gain such a perspective unless they look at the situation from a distance, searching for all existing regularities and patterns of behavior. Another way to construct a bird's eye view of the situation is analyzing the situation in different ways.

There are two main methods of analyzing reality: objective and subjective. The objective approach assumes looking at objects from the outside and is often associated with the term "correct". A subjective view means a view from the inside and is considered to be less reliable (O'Connor & McDermott, 2006).

These two approaches can be examined using the canons of systems thinking, without binding them with evaluations accepted in advance. To think objectively means to look at the system from the outside, and to think subjectively - from the inside. Systems thinking uses both approaches. In fact, full objectivity is unattainable, since it is impossible to exit a system of which one is part. Thus, a subjective and objective approach depend on how we define the boundaries of the system being analyzed (Jamali, 2005).

As previously stated, a systems thinking approach uses both approaches: subjective and objective. Therefore, it is important to be aware of what concrete approach is used in a given period. Both of them are necessary at the same time. It is also important to determine where the boundaries of the system are, keeping in mind that one cannot go beyond the boundaries of the system of which they are a part of. It is therefore essential to understand how the boundaries of a system are marked, and not to go beyond them (Czarniewski, 2014, pp. 9-13).

Management science puts forward suppositions and verifies them. Scientific and economical knowledge is therefore a set of constantly renewed working hypotheses about economic reality. Science plays an extraordinarily significant role – it provides knowledge, an understanding of reality, it improves the quality of life; but at the same time it does not address all aspects of reality.

Network Aspects of Business Management

Network theory is cited in literature in practically all traditional fields of management, such as: leadership, turnover, satisfaction, job performance, entrepreneurship, relationships, knowledge, and many others (Borgatti & Foster, 2003, pp. 991-1013). H. Håkanson and I. Snehota define the network in terms of three interrelated categories: participants in the network, resources available to them, and the actions they take (Håkanson & Snehota, 2005).

In a network economy, with its fluctuation states, it is necessary to take into account the subjectively defined participants of the network and its ecosystem (Niemczyk, 2013). It is also important to define the relationships occurring between the system and the network.

A system is always defined as a whole, made up of various parts. Simultaneously, the system as a whole is part of a greater whole. The system is not constant, but varies over time; in other words, it is dynamic in size (Huff, 1990). It is separated by its environment from other systems. System boundaries cannot be precisely determined.

The dynamic whole, which is called a system, consists of a network of links between its components, and between components and the whole. A network is the result of the mobilization of different processes that activate various components of the system, whereby causing a sequence of interactions. The establishment of a network does not mean that the system will reach their goals in an optimal way. This is because there are often distortions in networks that produce surprising and undesirable effects (Piekarczyk & Zimmiewicz, 2010).

Network thinking permits:

1. Seeing the problem from different points of view;
2. Obtaining a suitable definition of the problem;
3. Recognizing and investigating the interactions of particular elements;
4. Interpreting and developing models in order to "handle" the situation with the use of the scenario technique;

5. Distinguishing elements and relationships over which a supervisor, a management board or an owner has direct influence (and distinguishing elements and relationships over which they have no influence);
6. Studying and understanding the whole and its components;
7. Formulating specific rules on how to shape and operate the system;
8. Paying attention to the processes of change, learning and development (Rybicki, 2013).

B. Woźniak-Sobczak treats network organizations as a relatively permanent and horizontal form of unification of necessary capital, held by trusted autonomous network partners, enabling the creation of a final product that satisfies customers' needs. This determines the area in which to search for stimulators of value creation in network organizations (Wozniak-Sobczak, 2013). D. Watts defines four key elements for understanding networks:

1. The network has a significant size, in the sense that, with reference to people, it is counted in billions; and with reference to enterprises - in millions.
2. The network is dispersed, in the sense that each person has only a few hundred links, many orders of times less than the size of the total population.
3. The network is decentralized, that is, there is no central point that connects all or a majority of entities in the network.
4. The network is highly "clusterized", in the sense that most of the network is superimposed on itself (Watts, 1999).

The definition of the network, in terms of its place and role in business, has the following interpretations:

1. Network as an economic entity (capital group, holding).
2. Network as a group of companies centered around a common purpose (cluster).
3. Network as a location for conducting business (technology park).
4. Network as a business environment (WEB 2.0, the Internet as a dynamic platform of relationships and knowledge).

Companies may themselves be a network, do business in a network and may also participate in many networks of formal and informal character, simultaneously using the network (Web 2.0. Internet) as a source of knowledge formation about the market, competition and technology.

The logic of connecting systems and network thinking in constructing a business model may be based on the following assumptions:

- The business model is treated as a system,
- The system is a sum of relationships between components of the business model,
- Relationships are the platform for network development,
- The network is the environment and the localization of the business model.

In this situation, a hybrid model for the functioning of the company is created. This model connects strategic factors and entities involved in the company (its stakeholders). The stakeholders (related to the company through different relationships) and their value create a mutual symbiosis (Hamel, 2006). This symbiosis is the source of value creation for the company. The network of stakeholders is located around a core, which is the company.

Together, they form a business ecosystem . The goal of the company is to be active within this ecosystem, influencing it through the implementation of its business model.

CONCLUSION

1. Systems thinking considers a given economic (business) situation, and the notions associated with it, as a whole. It is impossible to obtain such notions if one does not look at the situation from a distance (from a certain perspective), to embrace all occurring regularities and patterns of behavior.
2. There is no conflict between systems and network thinking in management. Systems thinking is more commonly used to build a business model. Network thinking, on the other hand, allows for the implementation of systems thinking in a successful way.
3. Systems thinking strengthens the assurance of business continuity and stability of the business model. Network thinking helps in extending the boundaries of the company and also the boundaries of the business model.
4. The assumptions of systems and network thinking mark the path to managing the company based on logic. These assumptions indicate the potential that lies within the company and in within the business environment, which helps to form an effective business model.
5. A strong team of people who cooperate with one another achieve much better results than a group of dispersed people. Accordingly, a collective of very talented individuals will not be able to accomplish much if they do not learn to work with one another. To create a team, it is not enough to gather all the best employees of an organization. If they are not able to reach a compromise, the effects of their work will not be beneficial.
6. The fundamental principle of systems thinking relies on the fact that the behavior of a system is determined by its structure. The results obtained depend on the system structure. To improve results, there is a need to change the structure of the system.

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