

Organizational Structure Modeling of Innovative Company

Vladimir Mikhailovich Zotov¹

¹ VPK Consulting LLC, 13 Maliy Kozikhinskiy lane, Moscow, Russia.

Abstract

Issues of organizational structure did not find due attention in the creation of economic systems. In the search for ways to improve the effectiveness and/or efficiency of an enterprise (corporation, holding entity), its organizational structure is rarely subjected to some methodological analysis. Restructuring usually comes down to subjective decisions of the top-management and often leads to an uncontrolled increase of the organizational units depending on its ambitions.

However, tougher competition and the need to find an innovative way of development brings analysts to reconsider their attitude to the organizational structure of economic entities. In actual conditions of equal access to the main factors of production (raw materials, labor resources, production technologies, financial capital), the competitive advantage have those economic entities that create the best organizational structure. Using the same factors of production as other market players, they are faster and more efficient due to a better work organization.

This article attempts to study the phenomenon of organizational structure from a systemic perspective, relying on the apparatus of organizational design, on the one hand, and the modern theory of innovative development, on the other hand, in order to develop a universal model of the organizational structure of an economic entity that is adaptive to high dynamics of economic development. This model is designed to provide both flexibility (responsiveness) of the organizational structure to the requirements of the external environment, and rigidity (stability) regarding the preservation of its functionality.

Key-words: Strategic Apex, Operational Core, Administrative Staff, Technocratic Staff, Support Staff, Project Team, Staff Structure, Knowledge Base.

1. Introduction

The organizational structure is the supporting framework of any economic system and is a set of its structural divisions and positions, linked into a single whole by the relations of subordination, responsibility, technology, accountability, dependence, coordination, consistency, etc. The more diverse the relationships between the elements of the organizational structure, the more stable the

economic system, since the organizational structure is "responsible" for the integrity of the economic system.

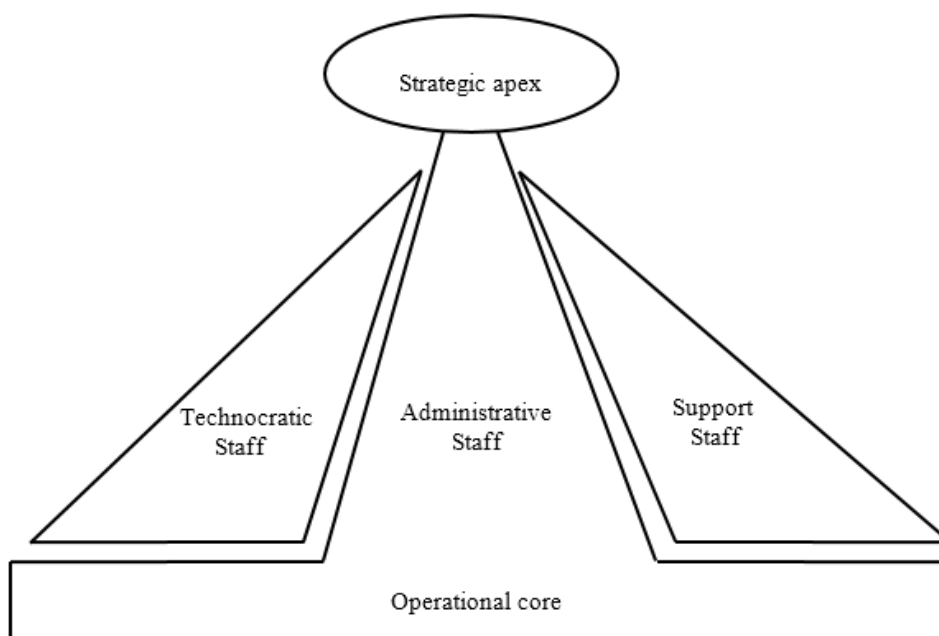
However, in conditions of high volatility of the economic environment an excessive rigidity of the organizational structure can harm to any economic system. Failure to adapt to changing external conditions can lead to loss of competitive advantages, deterioration of market positioning, and termination of the system. Consequently, the organizational structure of a modern enterprise or a holding entity must have the flexibility to be able to move quickly and to provide the expanded reproduction in the conditions of dynamically changing external environment.

2. Fundamentals of organizational design

The classical theory of organizational design [1, 3, 5] states that the organizational structure of any economic system includes five main blocks: the operational core, the strategic apex, the administrative staff, the technocratic staff, and the support staff (Figure 1).

The operating core consists of operators (regular workers) who perform the main work in the economic system corresponding to its mission. In this regard, locksmiths in a car repair shop, teachers in a University, doctors in a hospital, and actors in a theater are typical operators of their systems.

Figure 1. Composition of organizational structure.



The strategic apex is associated with the top management of the economic system, including its front leader and his immediate entourage. Referring to the list of systems in the previous example, these are the Director (CEO) of auto repair shop with a secretary and assistants, the Rector of University with assistants and advisers, the Chief Doctor of hospital with his secretariat and the Artistic Director of theater with his support team.

The administrative staff is a hierarchy of managers that connects the strategic apex and the operational core. This includes direct supervisors over operators i.e. line managers, supervisors over line managers, etc. up to a Deputy CEO. Thus, any member of the administrative staff is an intermediary in the flow of management information. It broadcasts its own management decisions and decisions received from higher – level bodies (managers) down, and information about deviations, proposals for changes, and draft decisions that require a higher approval.

The technocratic staff consists of analysts who seek to streamline and standardize the functioning of a managed economic system, which is related to its institutionalization. They create work schedules, develop and implement quality control systems, develop methods/algorithms for performing production and management operations, and form strategic planning and financial control systems.

The support staff is engaged in servicing all activities of the economic system. It ensures the regular functioning of its services, structural divisions and individuals. It usually includes a marketing department, public relations service, security, canteen, household service, etc. Ultimately, support personnel contribute to the achievement of the system's goal and mission. The range of auxiliary functions is expanded by increasing the specialization of individual components of the organizational structure.

The basic composition of the economic system described above will have in each particular case its own original content, which will determine the size of structural parts, their relationship to each other, distribution of power and other parameters of organizational design. In order to find an efficient configuration, the organizational structure authors need to match it with the current internal environment of the system (personnel, processes of creation/procurement of innovations, structure and content of the corporate knowledge base) and external situational factors (industry affiliation system, maturity of its manufacturing life cycle), and on this basis to fill parts of the organizational structure with specific elements and to link the latter into a unique system of power relations.

All organizational configurations of economic entities can be classified into two types [2, 4, 7]: bureaucratic and organic. The bureaucratic configuration of the organizational structure implies a

detailed formalization of technological and managerial operations, narrow specialization of each workplace, a strict hierarchy of authority and day-to-day control of work discipline. This configuration is typical for mass production enterprises with a simple technological cycle, operating in stable conditions. In conditions of instability and rapid changes, the bureaucratic organizational structure constrains individual initiative, generates red tape, internal confrontation, and evasion of responsibility, which leads to a decrease in the efficiency of the economic entity.

The organic configuration of the organizational structure is characterized by a moderate use of formal rules, decentralization of power, flexibility in the corporate development, in adoption and implementation of management decisions, and high adaptability to dynamically changing environmental conditions. This configuration is most fully implemented in target project teams or working groups. The latter are composed of employees from various structural divisions of the company to perform specific creative tasks, work in comfortable conditions and fully concentrate on finding solutions. At the end of the project, the team is off, and employees return to their regular job until a new project starts. The high motivation of project team members allows most of them to work from home office, often even with higher efficiency due to the flexibility of the work schedule. This effect was proven during the Covid-19 pandemic, when many innovative companies were forced to massively use home work.

Table 1 shows comparative characteristics of the bureaucratic and organic configurations of the company's organizational structure. It shows that neither one nor the other can provide an acceptable environment for innovative development. If the bureaucratic configuration of the organizational structure is not initially adapted to the production of innovations, then the organic configuration has difficulties in spreading the new knowledge got in new projects among the company's employees. Thus, the project team can successfully create innovations and their direct implementation in new products and/or services, and the bureaucratic organization can preserve innovations and their industrial use after the completion of pilot tests and full development of manufacturing technology.

Table 1. Comparative characteristics of bureaucratic and organic organizational structures.

Organizational structure Characteristics	Bureaucratic	Organic
The specialization of employees	Narrow	Wide
Rules of work	Work according to the rules	Creative work
Rights and responsibilities	Clear rights and strict responsibilities	Freedom of action and ambitious responsibility
Reward system	Normative reward system	Subjective reward system
Selection of personnel	Based on objective criteria	Subjective selection
Employee relationships	Formal	Informal, personal
The external environment	Simple and stable	Complex and unstable
Strategic goals	Known and regulated	Unknown, changing
Tasks	Simple, clear and fragmentary	Complex, with no clear boundaries
Power	Power appointed from top	Power obtained by competence
Management style	Strictly regulated hierarchical management style	Blurred mainly network management style

In order to provide a reliable basis for generating innovation continuously, it is necessary to combine the positive aspects of both approaches.

3. Organizational structure of an innovative company

Let's consider one of the possible variants of this combination. It integrates the best characteristics of both configurations within the universal organizational structure of an innovative company, "enclosed" in a multi-layer cocoon. Figure 2 shows a cross section of this configuration along a vertical diametric plane. As follows from the figure, two of its basic components (Regular organizational structure and Project teams) are hemispheres with a common horizontal diametric plane, and the third (Knowledge base) is a sphere that frames the basic components and has a common hemisphere with each of them. The next two layers of the cocoon sphere represent the immediate external environment of the innovation company, which play a significant role in its life. This whole layered cocoon is immersed in an external environment that should be associated with a supra system – a regional economy, a country's economy, or a global economy.

This spherical representation of the organizational structure of an innovative company reflects its key properties: geographical positioning of the strategic apex (top management) in the configuration

center, on the one hand, the close collaboration of its regular organizational structure with the project teams, on the other hand, and also the active interaction of these components with the external environment. The concentration of competences in the center of the organizational structure reflects compliance with the principle of management "from the center up-down" [6, p. 168]. Unlimited opportunities for information exchange of elements of the organizational structure among themselves and with the external environment create comfortable conditions for creative work and synthesis of a new knowledge.

At the bottom of the core of the organizational structure configuration is the regular organizational structure, more precisely its "frame part". As noted above, depending on the ratio of external and internal parameters of the company, it can have any real configuration: bureaucratic, organic or symbiotic (transitional). Within this (lower) part of the company's organizational structure, all its routine activities are concentrated.

In the upper hemisphere of the basic part of the organizational structure of an innovative company, project teams are expected to generate innovations (new knowledge). Project teams have to avoid the bureaucratic pitfalls for personal initiative – rigid division of work, excessive formalization of behavior, too detailed planning and total control – which allows an innovative company to remain flexible and ready for any unexpected situation. A project team exists until it reaches its goal or gets a negative result in its activities. To implement a large-scale innovative project, the company can form several project teams with appropriate communication links.

The knowledge base forms the outer shell of basic components (regular organizational structure and project teams). This is a universal repository where all known and available knowledge related to the subject area of an innovative company is concentrated. First of all, it contains the knowledge generated by its project teams, as well as scientific and design departments. It also stores formalized knowledge acquired on the patent market, as well as accessible for free industrial knowledge.

Creation of new knowledge is carried out as a result of the dynamic information impact of various parts of the organizational structure of the company and its environment. Figure 2 shows these interactions by dashed arrows that reflect the movement of knowledge and information within company's operation and development. In this case, if information flows between parts of the organizational structure of the company ("regular organizational structure – project team", "project team – knowledge base", "knowledge base – regular organizational structure") are predominantly regulated and mediated by formalized methods, the flows between the components of organizational structure and external environment of the company ("vendor – regular organizational structure", "dealer

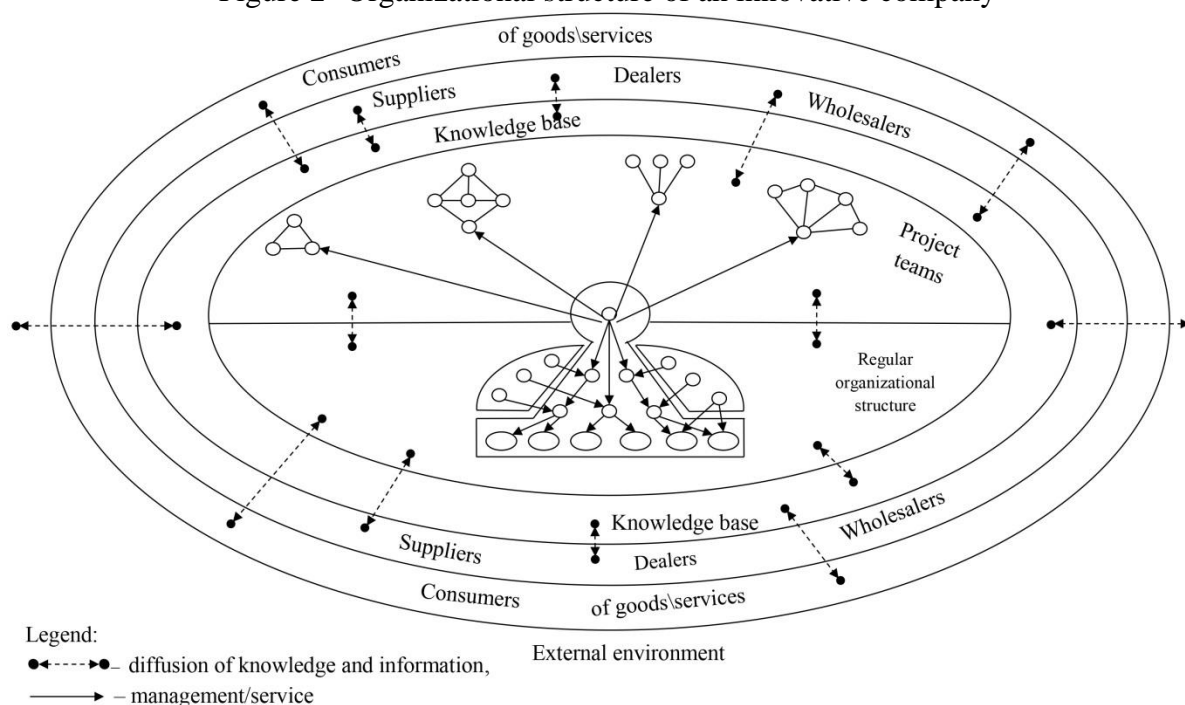
- project team", "wholesaler – knowledge base", "environment – knowledge base" etc.) are mostly free, and the knowledge generated by them requires additional formalization before being placed in the knowledge base.

4. Role of the organizational structure in the company's innovative development

The model of the company's organizational structure described above represents the process of generating new knowledge as a logical chain, thereby ensuring its innovation throughout the entire life cycle. For example, the idea of creating/acquiring a specific innovation can be suggested by any employee of the company, but it gets its final formalization in a specific project task in the central part of the organizational configuration – the strategic apex. Creation of an innovation is carried out by a project team, specially formed to implement the original idea, and ends with the preparation of a prototype of the new product or a concept of the new service. The development of a prototype or a concept to industrial technology is usually carried out by the company's regular R&D department. Manufacturing of new products is carried out by the production division of the regular organizational structure, and their sale on the market is provided by the sales divisions. Thus, the entire chain of innovation's creation is there, providing the necessary flexibility at the initial stages of the innovation process and sufficient rigidity at its final stages.

The information stored in the knowledge base of the organizational structure is regularly re-evaluated and updated in order to increase its value for the company. At the same time, each company organizes the treatment of formalized and non-formalized knowledge, moreover their use in the innovation process in its own way. In the vast majority of cases, the structure and content of the formalized part of the knowledge are determined by company's products and services. Structuring of the informal part of the knowledge is usually based on the strategic approaches of the company's top management.

Figure 2- Organizational structure of an innovative company



In turn, the formalized knowledge generated by project teams differs significantly from the formalized knowledge created by divisions of the regular organizational structure. While project teams usually develop conceptual knowledge through socialization and externalization, the regular organizational structure normally accumulates operational corporate knowledge through combination and internalization [6, p.87]. To master the new knowledge generated by project teams, the company develops special educational programs for the main categories of specialists in the regular part of the organizational structure, which are implemented by its own training center, or in specialized educational institutions. Thus, the dynamism and efficiency of project teams are harmoniously combined with the rigidity and stability of the regular part of the company's organizational structure.

5. Conclusion

The proposed model of the organizational structure of an innovative company is quasi universal. It can be successfully implemented in companies with a simple configuration of the regular part of the organizational structure, in companies with a divisional configuration of the latter, as well as in companies whose regular organizational structure is built on mechanical and professional bureaucratic principles. This universalism is based on the active exchange of formalized and non-formalized knowledge between the various components of the proposed organizational structure.

References

Drogobytskaya K S and Drogobytsky I N 2014 Architectural models of economic systems University textbook (Moscow: INFRA-M) p 301.

Drogobytsky I N 2016 System cybernetization of organizational management University textbook (Moscow: INFRA-M) p 333.

Zotov V M 2018 System of intellectual property management of a high-tech holding Publishing house "Scientific library" 159.

Kozyr N S and Nataova S M 2015 Classification of organizational management structures Economics and management of innovative technologies 3 19-27.

Minzberg G 2001 Structure in the fist: creating an effective organization, transl. from English (SPb: Peter) p 512.

Nonaka I and Takeuchi H 2003 Company-the Creator of knowledge: the origin and development of innovations in Japanese firms transl. from English (Moscow: Olymp-Business) p 384.

Revazova A A 2015 On advantages and disadvantages of various organizational management structures Scientific and methodological electronic journal "Concept" 30 451-55.