

Modern concept of a model design of an organizational system of enterprise management

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Received July 5, 2012; accepted July 15, 2012

Abstract. The article aims at the creation of modern principles of organizational system of enterprise management development in the functional space of “capital – labour resources – market”. It is suggested that the task should be set of organizational control system establishment by an enterprise in the projection of functional space to the plane of the informative activity of enterprise provision.

Key words: organizational system of enterprise management, organizational structure of management, capital, labour resources, market, information, entropy

INTRODUCTION

Ability to effectively and dynamically reform the underlying structures of enterprise management began from the determination of its competitiveness in modern economic space. The importance of the task becomes sharp in the field of enterprise organizational design, that is confirmed by such processes: by the thoroughly penetrating processes of information technology development and its consequences - globalization and personification of activity; intensifying of competitive activity and its translation of into new high-quality levels; acceleration of enterprise development dynamic in reply to strengthening and increase of frequency of the crisis phenomena in a socio-economic sphere etc.

The most known and developed tool in the field of organizational design are numerous models of management organizational structures (MOS). In course of time their number increases due to the creation of new hybrid structures or transference of accent of consideration in a new management-plane. The method of their application, as a rule, is limited to recommendations in relation to application of certain design for internal elements grouping and certain organizational intercommunications between them. There is the task of building the “correct” MOS [4], the solution of which remains unresolved today. In practice, as a rule, there are different hybrid MOS which

have little in common with classic models. The broad review of existing and promising MOS can be found in numerous publications [2-8,10,14-16,19,21,22]. Importance of the questions of organizational design decision was stipulated by numerous researches in such contiguous spheres as: creation of productive structures, forming of responsibility centres, development of the management informative system in an enterprise etc.

The basic task of this article is to work out methodical principles of development of complex models of organizational system construction in enterprise management’s (OSEM) design, which foresees the decision of the following tasks:

- determination, rationale and analysis of basic factors of OSEM design,
- development of model conception of OSEM design.

PRESENTATION OF THE BASIC MATERIAL

An enterprise as difficult dynamic system is described by such properties:

- by a form as a certain construction, by the correlation of form and content set in a particular moment of time,
- by reaching in content filling of mutual relationships of organization personnel,
- by space-time intercommunications of internal and external environments of enterprise.

That is, an enterprise appears as a combination of its structure and mechanism management which form its OSEM [11,12,13,17,18]. If the management organizational structure represents an especially well-organized aggregate of enterprise elements-parts, then an organizational mechanism determines the order and rules of co-operation of its elements. Essentially, OSEM (an organizational structure + organizational mechanism) must be formed under the necessities of economy of process of production

of product/services in accordance with market demand. It is expedient to examine modern OSEM from such viewpoints as: business structure, organizational structure of management, productive structure, structure of responsibility centres and informative infrastructure (Table. 1).

Table 1. Basic structural elements of OSEM

Elements of structure	Object of appendix	Efficiency criteria
Organizational structure of management	Labour and informative streams	Rational distribution and using of labour resources
Productive structure	Material and informative streams	Optimization of employment of industrial capacity and material resources
Structure of responsibility centres	Financial and informative streams	Profit maximization
Business structure	Material, financial and informative streams	Optimization of policy of presence at the market and maximization of the overcome market share
Informative infrastructure	Internal informative communications and depositories	Timely and reliable informative providing of administrative decisions

For the modelling of an effective OSEM it is needed to harmoniously combine purposeful elements in the new competitive socio-economic system. Such combination often requires alteration of traditional approaches to developments of new configurations with unique properties. Basic principles of forming MOS formed a major design basis of modern OSEM.

The analysis of scientific publications in the study of OSEM showed different researches orientation, the major elements of which are capital, labour resources and market. These factors form the functional space of OSEM design. It is possible to conclude that modern OSEM is formed by the balancing of basic properties in this space. The basic accents of OSEM design determine three datum planes of management: management of the capital; use of labour resources; co-operation with external environment.

As practice shows, growing possibilities of informative-communication and intellectual technologies in a management promoted the expansion of OSEM variations range in this space and smoothed the contradictions at the simultaneous use of their elements in the united system. This conception is conformable with the principle of „yin and yang”, which symbolizes co-operation of opposite positions and is entered in the famous Chinese «Book of Changes”.

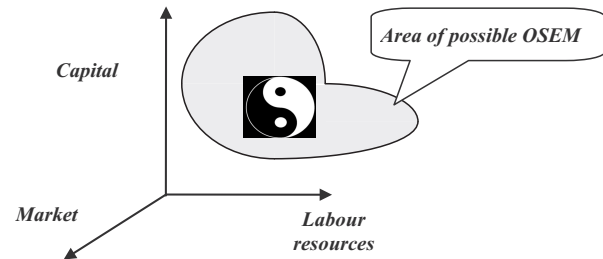


Fig. 1. Area of possible variants of OSEM design

Thus, the task of forming new theoretical principles of OSEM design takes into account a multi-layered and developed informative infrastructure which supports the consensus of the involved opposite structures properties balance. Purpose-setting is based on the analysis results of principles of OSEM variations on the different axes of functional space.

1. On the coordinate axis of capital management it is appropriate to apply the classification OSUP to the scale of mechanistic-organic MOS. Mechanical organizational structures (hierarchical, formal, bureaucratic, classic, and traditional) are characterized by the hard hierarchy of power in an enterprise [1,2,4,6-8,19]. Such organization is associated with a machine mechanism that is intended for organization of productive operations. Such structures foresee deep regulation of post requirements, rights, duties and observance of tight rein and clear hierarchy in management system. The specific characteristics of these structures are the centralized acceptance of decisions, hard control of activity, predominance of vertical stream of directive information and reports on implementation. Mechanical organizations are effective, when a conservative withstand technology is used in the conditions of simple and static external surroundings. The aims of a mechanical organization are sent inward to the recreation of the production capacity maintenance of the present system. Hard inertia organization is not able to instantly react on the change of market requirements.

Organic OSEM (adaptive, flexible, self-organizing) is characterized by fuzzy fluid boundaries of management hierarchy, few management levels, flexibility of management structure, weak or moderate using of formal rules and procedures, decision-making decentralization, wide power and responsibility in activity. Their aims are directed to an external environment, and the structure is the means of reaching the target necessary for the realization of permanent changes. Such OSEM got wide distribution in world practice as the most reliable means of survival of enterprises, first of all, of small businesses in the conditions of hard market competition. Organic organizations are characterized by the weak or moderate use of formal rules and procedures, decentralization and participating in making decision, by the wide sphere of responsibility in-process, flexibility of structure of power and few levels of hierarchy. The main property of such OSEM is their ability to change the form, adapting to the dynamic terms of existence. Such enterprises are capable to quickly and easily adapt to the market changes, which

is advantageous in hard competitive activities. Project, matrix and brigade form of OSEM are varieties of this type.

A summary of comparative features of basic factors of mechanic and organic OSEM are given in Table 2.

Table 2. Comparison of mechanic and organic OSEM

Mechanic structures	Organic structures
Exact determination of rights, duties and technical methods	Weak specialization and standardization of activity in the conditions of continuous redistribution of individual tasks
Hierarchical structure of control of power and communication	Network structure of control, power and communications
Knowledge concentration on the hierarchy top, where making decision is carried out	Location of technical and commercial knowledge after requirement in any place of structure
Predominance of vertical co-operation between the members of enterprise - workers	Predominance of horizontal contacts between members of different levels in form near to consultation
Hard regulation of performed actions through instructions and by guidance decisions	Self-organization as a method of reacting on indignation in activity
Universality and firmness of management structure	Flexibility of management structure, ability to adapt, lightness of change of form
Stability of co-operation forms on the basis of clearly and strictly defined rules	Association temporariness on the implementation period of project/program
The wide bringing in of coordinating sublevels with clear and strict determination of their rights	Fuzzy levels of management and small number of management levels

In modern conditions various hybrid systems are used which combine the features of the opposing OSEM types. For example, in tensor structures with classical management planes new additional areas may be used with extended rights of self-management. In fact in the conditions of large enterprise the right of the acceptance of administrative decisions is distributed on different levels tensor OSEM is provided by further development of matrix structure, its gradual transformation in n-dimensional structure.

2. The next axis of market co-operation embraces OSEM range from well organized to diffusive (network, shell) [3,5,9,11,12,20,21]. In fact, modern organizations are oriented onto the market, innovation is often used, and that is why a concomitant risk must be taken into account from permanent own transformation, conditioned by external factors. Management of OSEM design is a widely used marketing conception in modern practice. This conception foresees the large variety of the systems depending on volumes and nomenclature of products, having a special

purpose orientation and choice of segment of market, method of advancement to the market etc. The transfer of auxiliary functions to extraneous organizations has become commonplace to provide the necessary flexibility and increase of functioning efficiency by narrowing of specialization and improve professionalism in general. The transition originates from bilateral attitudes toward the network co-operating with suppliers and clients. These phenomena contribute to the transition from a vertical hierarchy to the horizontal structures of organization by forming of functional structures of independent working groups and by predominance of contract relations above the administrative. The development from the well organized withstand systems to the diffusive systems foresees forming of higher order of self-organization, reflective conduct and motion, synergistic design of objects and promotion of self-teaching processes. Researches in this sphere have been conducted by Castells M., Daniel M., Milner B. and other.

The diffusive systems are the systems without partitions which differentiate influence and actions of factors of different nature. The personal features of these structures are fundamental instability, stochastic, dynamic equilibrium and partial vagueness of information. The transition from the well organized equilibrium of organizational structures to diffusive market structures was first of all conditioned by growing possibilities of co-ordination activities on the basis of global informatization. The feature of diffusive structures is an aggregate of working groups with a different level of autonomous activity which is directed in such spheres as: providing productive activities with necessary resources; production of product/service of favour for a concrete consumer; individual personal maintenance, development or penetration to the concrete market. Basic advantages of such organizations is the following:

- absent requirement in reorganization for the change of priorities of activity, it is possible to change accents by the redistribution of resources by guidance,
- it is possible to conduct local reorganization of separate subdivisions without the serious changes of the state of other structure - id est a greater "multidimensional group", which is a further proof,
- a maximally favourable situation is created for delegation of plenary powers, although the role of coordinating centre remains a qualifying one,
- the applied compatible measure of efficiency of activity (profit) is clearly fixed and measured easily, that prevents implementation of mock work and origin of bureaucracy.

The summary of comparative features of basic factors of balanced and diffuse OSEM is given in Table 3.

Active elements of diffuse OSEM helps balance the integration process. In fact, the formation of network structures is accompanied by fundamental transformation of the enterprise and its OSEM.

3. On the coordinate axes of labour resources, classification of OSEM needs to be conducted on a scale of individualist-corporate organizations [1,7,15,16]. A cor-

porate structure can be presented as the special system of connections between people in the process of their realization of joint activity.

Table 3. Comparison of the well organized and diffuse structures

Well organized structures	Diffuse structures
Department structure	Dissipative and network structures
Synthesis of systematic and situational approaches in management	Synthesis of cybernetic and process approaches in management
Support parameters activity in a range of internally stable operation	Concordance of parameters with the state of external environment
Sustainable consistently planned transformation of the system	Dynamic equilibrium with the possible points of bifurcation
Stability, maintenance of stationary state	Self-organization on the basis of synergistic principles
Evolutionary development of the system through interaction with external environment. Deterministic and stochastic, static and dynamic models of management	Spontaneous fluctuation of structured-forming elements under the influence of external environment. Stochastic, dynamic and reflective management model
Adaptation to the action of external environment and adaptation to the changes	Constructing of external environment with the use of synergistic effect
Determined or probabilistic information on the known law of distribution	Ambiguity of information and multi-criteria evaluation of management actions
Statistic, integrated and average indexes of activity evaluation	Process's characteristics activity, forecasting the trend of activity

The decision-making in corporate organization takes place on the principle of majority. On one hand a corporate structure undertakes responsibility for the members, and on the other hand it takes away certain rights for workers. The basic principle of its organization is "support of the weak and limitation of the strong". An important condition and method of support of existence of corporate organization is its permanent support of deficit of certain resources, and in case of a necessity, its intensification of deficit. The leaders of corporation use a monopoly on this deficit as important source of power. Supporting a monopoly on information, a corporation aims to standardize their own activity and shut out an internal competition. This principle is the basis of "divide and rule". "Collective" responsibility puts a man in strong dependence and practically deprives him of independence, coming from the principle – the organization is always right. In accordance with its priority, an aim is set that is characterized by predominance of the organizational above the individual. Aspiration to win the support of majority forces the leader to the populist

actions. To that purpose, as a rule, the symbol of power of organization and its omnipotent character are formed. In such structures loyalty prevails in the organization over manageability and honesty which in the future unavoidably welcomes irresponsibility.

On the other side of the scale are individualistic structures (adhocracy and participatory organizations). Individualist organization is an open and voluntarily association of people. Resources unite around the person. The monopoly is replaced by a combination of competition and cooperation in the activities of its members. Instead of imperious hierarchy in individualist organizations there is the principle of linking of interests of all members within the framework of democratic processes. The combination of competitions and co-operations are in the activities of such organizations, interests of production are determined by the tasks of recreation of person. Decision-making in individualist organization is built on the principle of a veto. The principle of minority helps to remove populism in the actions of guidance, presents a significant ability to listen and convince others, and thus the atmosphere of efficiency and professionalism prevails. For these organizations the following is characteristic: insulation of performers' labour, flexible structures of management, variable character of loading of separate performers, change of specialization of workers. Practice shows that the competitiveness of these organizations is very high.

Adhocracy organization is based on the knowledge and competence of performers, each of which undergoes a strong external pressure, which partially relaxes groupware. Risk as well as remuneration is distributed among participants. Formalities in the structures design are minimized. Dominated by informal and horizontal ties, OSUP is constantly changing. Such OSUP is characteristic for industries of high technology in complex innovation processes (such as counselling centres).

Members of participatory organization provided opportunities to participate in setting the purposes, solving problems, and to prepare and make decisions in their activities. The key feature of participatory organization is the capacity of its members. Control in the management supports the establishment of targets for intense performers. Facility of target achievement is required from performers. Each participant is directly responsible for the actions and rewarded after the attained results. There are three levels of participation: coming up with suggestions, development of alternative variants and acceptance of final decision. Elements of participatory organizations are widely used in universities (academic councils, etc.).

Summary of comparative features of basic factors of individualist and corporate OSEM is given in Table 4.

Interim position on the scale corporate-individualist OSEM are entrepreneurial organization. These companies focus on growth and are more likely to implement potential than the use of available resources. The structure of these organizations is characterized by a moderate number of management levels, flexibility and network structure. It is in a great deal provided by the transition

to decentralized structures of “profit centers” of democratic businesses. The essence of balance between the opposite elements on the scale is presented in Figure 2.

Table 4. Comparison of individualist and corporate OSEM

Corporate structures	Individualist structures
Formal bureaucratic atmosphere	Open mutually beneficial atmosphere
Strictly regulated mutual relations, narrow range of operating specialization of workers	Flexible and stable mutual relations, multifunction specialization of workers in composition of process commands
Prevailing of hierarchical imperious structures. Interests comport leaders	Domination of principle of tying up of interests of all members is within the framework of democratic process
A middle level of obligation of parties, decision of conflicts is through administrative orders	A high level of obligation of parties, decision of conflicts is on the base of norms of reciprocity
Aiming at activity is static functional organization of activity	Aiming at a result is dynamic process organization of activity
Tasks simple and partial, difficult process of concordance	Tasks complex and purposeful, simplified process of concordance,
Partitioning of production on base operations, fragmentation of process on simple tasks	Reintegration of operations, passing to the interfunctional business processes
Strict subordination is in the bulky hierarchical system	Interdependence, collaboration, dispersion of power and responsibility
An orientation is towards the decision of tasks on the basis of long-term experience of mass production and dictate of producer	Orientation towards satisfaction of clients, „struggle” for a client in the conditions of the saturated market and hard competition
Score value created by highly specialized operations	Evaluation of the results of process activity

The most pronounced trend towards steady transfer of personnel from the production sphere to information processing is conditioned by such factors as:

- it is necessary to implement new informative-communicative administration technologies for treatment of growing volumes of information, which cannot be provided by the existent operating facilities (it is known that volumes of scientific knowledge have doubled in the last 2-3 years),
- the increase of material expenses on informative support of business processes in the global market environment and inheritance of traditional paper circulation of documents stimulates forming of new multilevel informative infrastructures,
- absence of universal program-instrumental facilities complicates the problems of description, integration, authentication of knowledge in different subject domains and requires the wide bringing of specialists-experts commands,
- service of dynamically growing bank of knowledge, including counseling and training (also remote) of specialist enterprise.

Summing up the results of the analysis of OSEM classification in different planes it is possible to confidently assert that modern enterprises continue to be oriented towards the mixed hybrid structures. A measure of balance is informative description determined by the ability of enterprise elements to counterbalance opposite properties in the planes of capital, labour resources and market.

Based on the results of analysis of possible planes of OSEM design (Table 2-4) it follows, that the increase of number of kinds OSEM related to the fundamental stochastic and instability of external organizational rejections, as well as nascent chaos is compensated for by the increase of elements of enterprise’s internal ability to efficiency. In Figure 3 different approaches of development of the informative providing are represented at the use of opposite OSEM types. If in the first case of Figure 3 necessities of subdivisions are limited to the minimum of necessary information and require hard co-operation, then in the second case (Figure 4) the relationships between subdivisions have a wide range of co-operation, providing flexibility of tuning of activity.

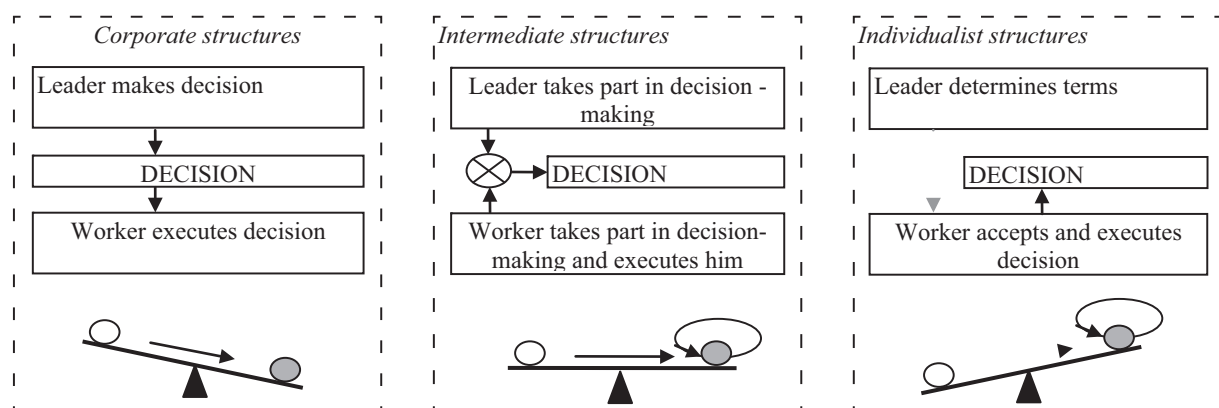


Fig. 2. Features of functioning of individualist and corporate organization

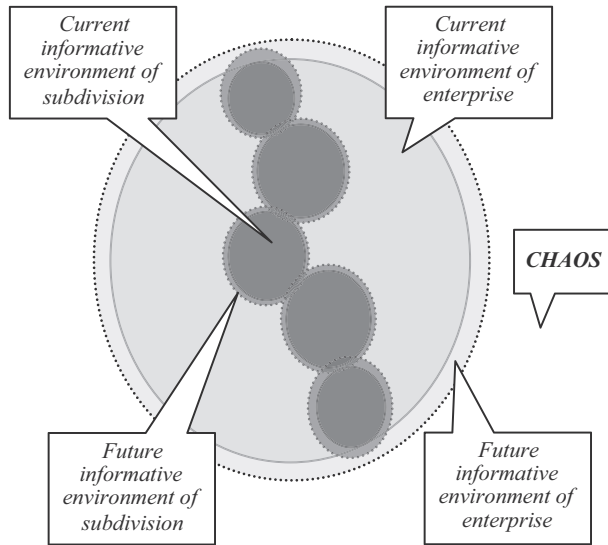


Fig. 3. Strict approaches to OSEM design

The latter in a great measure is provided by growing of informative-communication and intellectual technologies, involved in a management. The rational level of co-ordination is determined by the level of information technology development for any element of enterprise:

- in any place and at any time to have a free access through communication networks to any necessary information,
- to have the developed tool for the decision of the set tasks at the level of the informative providing,
- to own necessary resources for harmonious encapsulation in informative infrastructure of enterprise.

It is possible to establish, that development and introduction of new OSEM became the feature of the new XXI century. After diversifying OSEM primarily contribute to increased opportunities for information-communication and intellectual components of modern management, which can confirm the following factors:

- activation of innovative processes in industries of productive-market activity,
- actualization of the use of creative initiative of enterprises workers,
- modifications of informatively-administrative processes,
- introduction of electronic intellect in the processes of acceptance of administrative decisions,
- translation of labour resources from material production to the information sphere,
- encapsulation in the global information system for providing of competition as a result of globalization.

For this purpose the necessary features are consolidation of functionally-administrative configuration of enterprise, creation of the dynamic harmonious concerted structure, proportion of volumes of power and responsibility of each participant of configuration in organization. Impossibility of static decision of the set tasks is examined as primary cause of permanent changeability

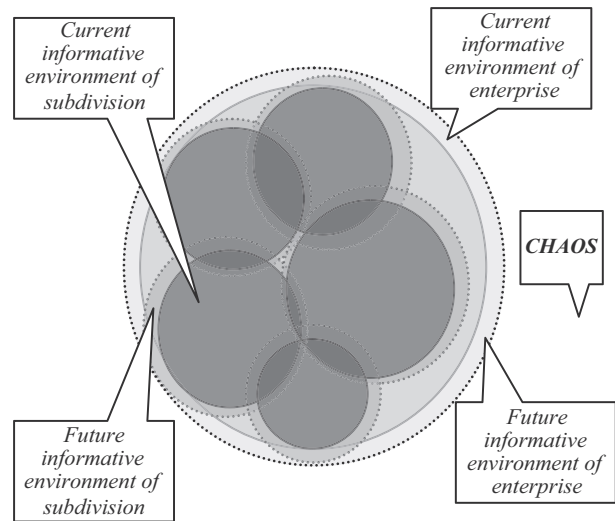


Fig. 4. Flexible approaches to OSEM design

of socio-economic structures. Thus, conception of OSEM design can be represented as balancing of opposite forces.

The task of OSEM design can be interpreted as an accumulation of structural information in the enterprise, necessary for its stable functioning within the limits of preset parameters of development.

Information is the general cognitive-vector measure ordering the organization in space and time in the context of enterprise functioning. Entropy is a measure of uncertainty diverse and irregular activity of organization. Obviously, the increase of information loss at systemic treatment of external perturbations increases the level of organization disorder. In general, the task of OSUP design should consider proceeding with the following provisions:

- for organization of activity an enterprise must accumulate and consume internal and external information,
- the relationship of entropy and information is reflected in the Bryllyuen formula:
 - $H + Y = 1$ (ENTROPY + INFORMATION = 1),
- organizations inevitably loose their competitiveness in low external exchange of information,
- any organization at some point in evolutionary development reaches the limits provided for ordering its activities,
- entropy of a closed organization leads to deregulation and open organization makes more domestic agenda by adapting to external perturbations, provided the overall impact of homogeneity,
- companies with higher internal ordering benefit in competition with similar organizations.

Thus the special purpose of OSEM design is the accumulation of structural information due to a decrease of entropy. Efficiency of the conducted measures can be estimated by the difference between the preliminary existent and attained level of entropy.

Concepts of the system, good organization and self-development are the basis of modern OSEM design. The

moving force of transformations is the information potential, the use of which has dual nature. It means that OSEM design can generally be seen as a struggle of two opposing trends - point concentration and wide distribution efforts to accumulate the information potential.

CONCLUSIONS

Realization of non-linearity and multidimensionality of organizational structures development, its ambiguity and non-planning has become the source of the new understanding of the world of organizations and organizational order. The considered approach allows for the setting of the task of OSEM design in terms of information technology introduction and for harmonious combining of opposite multidimensional properties of management system. Such an approach should be used to form the most various combinations of the known OSEM types in practice with the purpose of adaptation to specify their operating conditions. Thus, the problem of effective OSUP design involves activation of dominant recessive suppression properties and properties defined in the space of admissible variations of the combination of organizational elements.

The main directions of further research will determine the basic set of factors of OSEM design. This will build a new effective model for simulation and evaluation of OSEM.

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