“Organizational development in banks management systems”

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ORGANIZATIONAL DEVELOPMENT IN BANKS MANAGEMENT SYSTEMS

Abstract

Organizational development in banks management systems (ODBMS) is a complex phenomenon of a sustainable and multifunctional nature. The goal of ODBMS is to generate creative ideas and implement changes in order to provide an appropriate level of rational interaction between the ODBMS subjects. It leads to an achievement of the expected economic and managerial results.

Organizational changes that are accompanied by organizational development in the BMS can be controlled and spontaneous, positive and negative. The idea of the article is to reveal the methodical aspects of the managed organizational development of the BMS, with expected positive effects. It would be shown that the offered ideas can be used for achieving organizational goals, avoiding the organizational entropy, increasing the creative activity of bank employees, in particular, in developing new banking products, expanding the opportunities of Internet banking, etc.

Achieving certain positive effects from the implementation of organizational changes in the BMS requires a high level of managers awareness about the state of implementation of the goals of the bank's organizational development, the methods of their implementation, factors that affect the achievement of these goals. In this context, fundamental information about the structure and links in the BMS is important as well as operational information that characterizes the level of completeness and implementation quality of the specific banking officers' duties.

In the article the features of ODBMS are solved, based on the application of the provisions of morphological analysis and set theory. The proposed provisions are considered through the prism of two criteria – the level of managerial awareness and predictability of the results of the organizational changes implementation.

Keywords organizational development, changes, organizational changes, effects, bank management system

JEL Classification G21, M1

INTRODUCTION

Taking into account that organizational development in the BMS is a multilevel entity with a number of components and links, the activity aimed at organizational development in the BMS should be sufficiently informative, that is, the data for an acceptance of certain organizational decisions should be sufficient and objective. The analytical findings of the investigated banks allow suggesting that the high level of information quality about the ODBMS provides a morphological analysis. It allows us to consider all the structure levels of organizational development as topological and metric sets, the elements of which are linked by cause-effect relationships. Its application includes the following:

1) setting the purpose of the morphological analysis (the understanding of causal relationships between the components of the BMS and the indicators that characterize them);

2) construction of the morphological decomposition of the organizational development in the BMS (higher, middle, lower);

3) identification of topological and metric spaces of organizational development in the BMS;

4) summarizing the morphological analysis results.

1. LITERATURE REVIEW

The fundamentals of organizational development originate from the theory of management, in particular in the writings by Shenon (1949), Herzberg (1960), Maslow (1966), and Beckhard (1972). Thus, Shenon argued that the effectiveness of management systems depends on the effectiveness of communication between management entities. Herzberg studied the problems of labor motivation in the context of identifying opportunities to ensure the productivity growth. He found that improving working conditions is a necessary, but not sufficient condition to motivate employees to better work on their organization.

Maslow formulated a positive, humanistic theory of human behavior. Unlike many other researchers who focused on psychoanalysis as an instrument for detecting psychological deviations from norms, he made an attempt to explain the behavior of people, in particular, workers from organizations from the standpoint of their needs and their level of satisfaction. In turn, Beckhard's merit is that he applied a pragmatic approach to management. This approach assumed that positive changes in the management system should have three preconditions: 1) dissatisfaction of staff with the current state of affairs; 2) awareness of necessary changes, clear vision of goals; 3) the ability of staff to implement specific steps to achieve the desired goals.

The said scientists actually laid the foundations for explaining the functional relationships between factors that influence the motivation of the corporate staff, the productivity of their work and organizational goals.

The next stage in deepening the theory of management and organizational development of banks is associated with the names of Daly (1971), Benston (1975), Smith (1975), and Campbell (1980). The merit of these scholars is that they, from the standpoint of systemic and functional approaches, considered the problems of managing the development of banks, theoretically and empirically proved the feasibility of using the alternative mechanisms of organizational development, proposed an applied instrument for quantitative and qualitative analysis of the internal and external business environment.

Significant contributions to management theory, in particular to organizational development, were made by Diamond (1984) and James (1987). These authors, like Shenon (1949), have focused on the fact that organizational development, as well as management in general, has an information basis. In view of this, the peculiarity of their work is shaping the information and communication models of interaction between the subjects of management that are most optimal for achieving positive, economic and organizational effects from the organizational changes implementation.

Despite significant scientific advances in organizational development, most of the aspects covered by scholars are fragmented.

2. METHODS

The research is based on the system, processes and quantitative approaches that are chosen for proper understanding the place of ODBMS and on making assumptions about the characteristics of the organizational development implementation and for identifying the results of the investigated changes.

The authors' findings are based on the method of morphological analysis, which in combination with the theory of sets allowed to understand a logic of connection between the prerequisites of the organizational changes implementation, the essence of the organizational decisions and the results of the organizational development.

The research method consists of the following steps:

- the construction of the morphological decomposition of the BMS;
- specification of the elements in the sets that form the topological and metric spaces of the BMS;
- identifying the types of the organizational development in terms of building organizational management structures in the BMS;
- organizational development analysis in the BMS and determination of factors affecting the ODBMS;
- identifying the capacity of the organizational management structures as a measure of the ODBMS level.

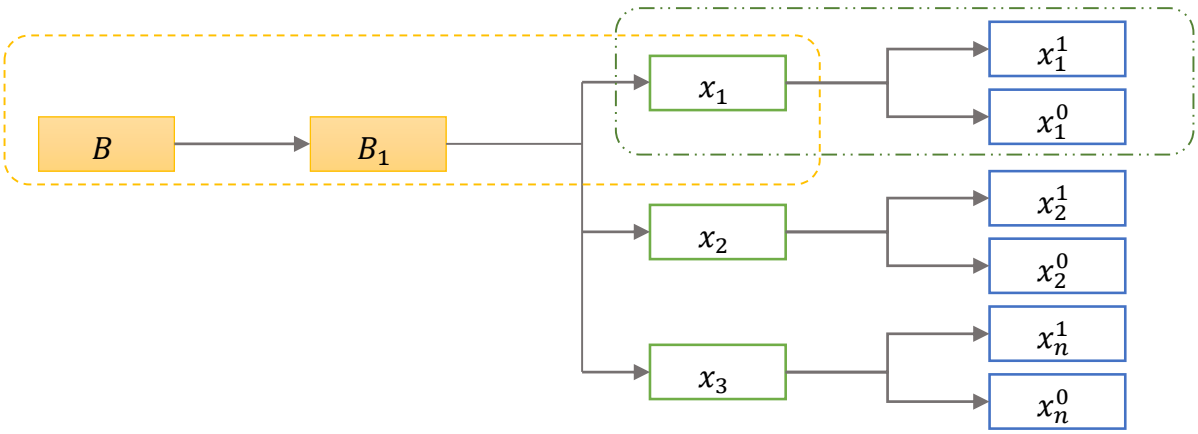
3. RESULTS

In order to conduct the morphological analysis of the organizational development in the BMS, it is necessary to construct a morphological decomposition:

- B – higher (institutional) level of bank management; B_1, B_2, B_n – bank management structure;
- C – middle level of bank management; C_1, C_2, C_n – structural departments of the bank on the middle management level; $C_{1.1}$, $C_{1.2}$, $C_{1.n}$ – officials of the structural department C_1; $C_{2.1}$, $C_{2.2}$, $C_{2.n}$ – officials of the structural department C_2; $C_{n.1}$, $C_{n.2}$, $C_{n.n}$ – officials of the structural department C_n;
- H – lower bank management level; H_1, H_2, H_n – structural departments of the bank at the lower management level; $H_{1.1}$, $H_{1.2}$, $H_{1.n}$ – officials of the structural department H_1; $H_{2.1}$, $H_{2.2}$, $H_{2.n}$ – officials of the structural department H_2; $H_{n.1}$, $H_{n.2}$, $H_{n.n}$ – officials of the structural department H_n.

It is necessary to specify the components of the set that form the topological and metric spaces in the limits of the morphological decomposition. The topological space includes a continuum and a system of subsets. A fragment of organizational development in the BMS at the top level of management is presented in Figure 1.

Symbols: x_1^1, x_1^0 – values of an indicator x_1; x_2^1, x_2^0 – values of an indicator x_2; x_n^1, x_n^0 – values of an indicator x_n. All symbols with the lower right index 1 are indicators of the timeliness of the tasks assigned to the bank employees of the corresponding formal groups in the BMS. Index 2 refers to the indicators that reflect the completeness of the tasks, and the index n shows the quality of the tasks.



Note: The dotted line denotes the topological space, and the dash-dotted line presents a metric space.

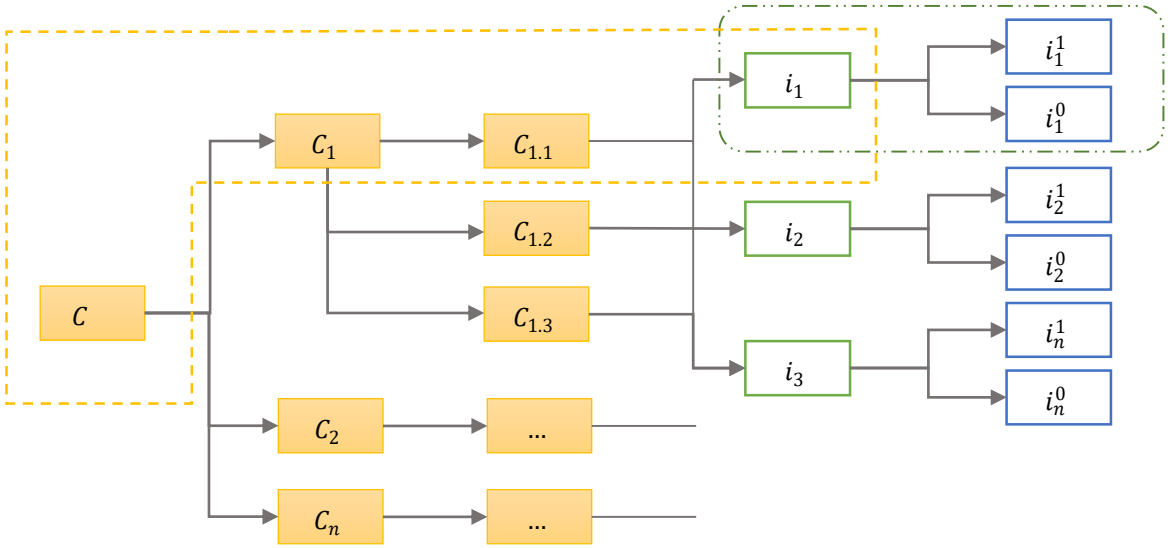
Figure 1. The fragment of the morphological graph of the organizational development in the BMS at the top level

Dotted lines highlighted topology space of morphology graph in Figure 2. In this case, $B \wedge B_1$ is an ordered pair, where B is a set, and B_1 is a system of subsets satisfying such conditions:

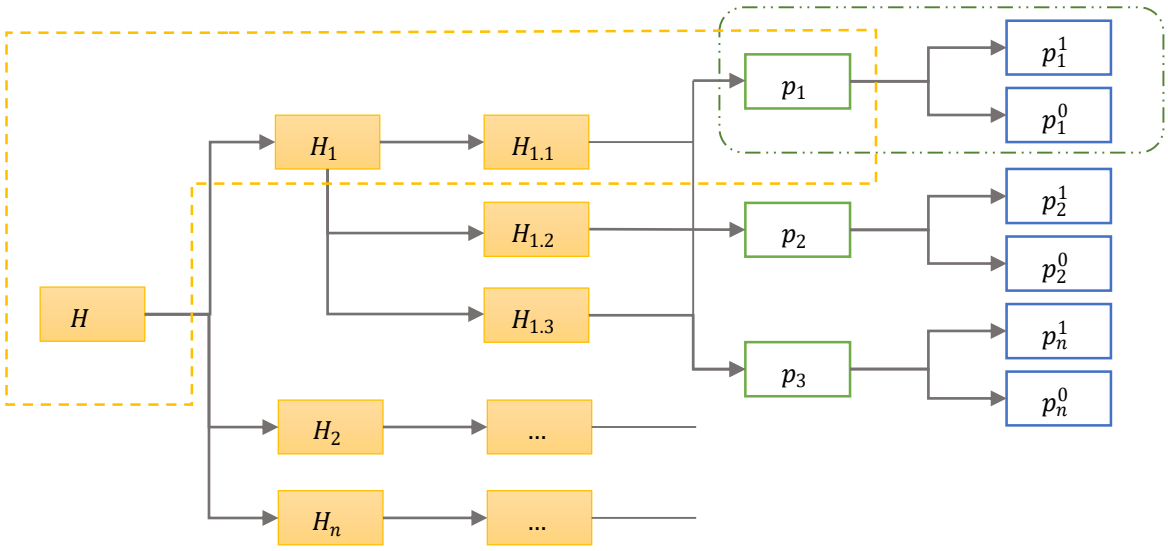
$$B \supset B_1 \equiv \Lambda_1; \quad \Lambda_1 \equiv B \mid B \equiv B_1 \cap \left\{ \begin{matrix} x_1, x_1 \in B; \\ x_2, x_2 \in B; \\ x_n, x_n \in B; \end{matrix} \right\}, \quad (1)$$

where Λ_1 is a topology on a $B_{1.1}$ that is a subset of a set B_1 that represents temporary and permanent formal and informal groups in a particular structural department of the bank.

According to such logic of constructing the morphological graph (see Figure 1), a topology $\Lambda_2 \wedge \Lambda_3$ on a subset $B_{2.2}$ and $B_{n.n}$ has been identified.



A) Middle management level



B) Lower management level

Note: The dotted line denotes the topological space, and the dash-dotted line presents a metric space.

Figure 2. The fragment of the morphological graph of ODBMS at the middle and lower management levels

Values of the indicators that characterize the implementation completeness and quality of bank employees functions are given with the upper indicators in Figure 1.

Symbols: i_1^1, i_1^0 – values of the indicator i_1; i_2^1, i_2^0 – values of the indicator i_2; i_n^1, i_n^0 – values of the indicator i_n; p_1^1, p_1^0 – values of the indicator p_1; p_2^1, p_2^0 – values of the indicator p_2; p_n^1, p_n^0 – values of the indicator p_n.

The values of these indicators form the metric space of the morphological graph. Metric space is a pair of sets and distances for a pair of elements of the set. In this case:

$$x_1^1 \Leftrightarrow r; x_1 \wedge x_1^1 \equiv x_1^0 \in X \mid d(x_1^1, x_1^0) \prec x_1^1, \quad (2)$$

where *r* is the radius of the ball; *d* is the distance between the elements of the set.

In the BMS, apart from the metric space, there are also other metric spaces (*Y*, *Z*), where

$$Y \supset x_2 \wedge d(x_2^1, x_2^0), \; Z \supset x_n \wedge d(x_n^1, x_n^0).$$

These metric spaces represent the middle and lower management level in the BMS (Figure 2). The peculiarity of the morphological decomposition of ODBMS at the middle and lower management levels is that its sets are not singletons.

The topological spaces of the morphological graph of the middle bank management level are:

1) $C \wedge C_1$, where C_1 – system subsets that satisfy the following conditions:

$$C \supset C_1 \supset \begin{cases} C_{1.1} \equiv \Lambda_4; \\ C_{1.2} \equiv \Lambda_5; \\ C_{1.n} \equiv \Lambda_6, \end{cases} \quad (3)$$

where Λ_4 – topology on $C_{1.1}$; Λ_5 – topology on $C_{1.2}$; Λ_6 – topology on $C_{1.n}$;

2) $C \wedge C_2$, where C_2 – subsets systems that satisfy the following conditions:

$$C \supset C_2 \supset \begin{cases} C_{2.1} \equiv \Lambda_7; \\ C_{2.2} \equiv \Lambda_8; \\ C_{2.n} \equiv \Lambda_9, \end{cases} \quad (4)$$

where Λ_7 – topology on $C_{2.1}$; Λ_8 – topology on $C_{2.2}$; Λ_9 – topology on $C_{2.n}$;

3) $C \wedge C_n$, where C_n – subsets systems that satisfy the following conditions:

$$C \supset C_n \supset \begin{cases} C_{n.1} \equiv \Lambda_{10}; \\ C_{n.2} \equiv \Lambda_{11}; \\ C_{n.n} \equiv \Lambda_{12}, \end{cases} \quad (5)$$

where Λ_{10} – topology on $C_{n.1}$; Λ_{11} – topology on $C_{n.2}$; Λ_{12} – topology on $C_{n.n}$.

Topology spaces of the lower management level morphology graph are:

4) $H \wedge H_1$, where H_1 – subsets systems that satisfy such conditions:

$$H \supset H_1 \supset \begin{cases} H_{1.1} \equiv \Lambda_{13}; \\ H_{1.2} \equiv \Lambda_{14}; \\ H_{1.n} \equiv \Lambda_{15}, \end{cases} \quad (6)$$

where Λ_{13} – topology on $H_{1.1}$; Λ_{14} – topology on $H_{1.2}$; Λ_{15} – topology on $H_{1.n}$;

5) $H \wedge H_2$, where H_1 – subsets systems that satisfy such conditions:

$$H \supset H_2 \supset \begin{cases} H_{2.1} \equiv \Lambda_{16}; \\ H_{2.2} \equiv \Lambda_{17}; \\ H_{2.n} \equiv \Lambda_{18}, \end{cases} \quad (7)$$

where Λ_{16} – topology on $H_{2.1}$; topology on $H_{2.2}$; Λ_{18} – topology on $H_{2.n}$;

6) $H \wedge H_n$, where H_n – subsets systems that satisfy such conditions:

$$H \supset H_n \supset \begin{cases} H_{n.1} \equiv \Lambda_{19}; \\ H_{n.2} \equiv \Lambda_{20}; \\ H_{n.n} \equiv \Lambda_{21}, \end{cases} \quad (8)$$

where Λ_{19} – topology on $H_{n.1}$; Λ_{20} – topology on $H_{n.2}$; and Λ_{21} – topology on $H_{n.n}$.

Based on the morphological analysis, it is possible to identify the factors that cause the problems of organizational development in the BMS and prove the choice for their solution.

Table 1. Metric spaces of the morphological graphs of ODBMS at the middle and lower management levels

Management levels	Metric spaces
Middle level	$I_1 \supset i_1 \wedge d(i_1^1, i_1^0); I_2 \supset i_2 \wedge d(i_2^1, i_2^0); I_n \supset i_n \wedge d(i_n^1, i_n^0);$ $J_1 \supset j_1 \wedge d(j_1^1, j_1^0); J_2 \supset j_2 \wedge d(j_2^1, j_2^0); J_n \supset j_n \wedge d(j_n^1, j_n^0);$ $U_1 \supset u_1 \wedge d(u_1^1, u_1^0); U_2 \supset u_2 \wedge d(u_2^1, u_2^0); U_n \supset u_n \wedge d(u_n^1, u_n^0);$ $O_1 \supset o_1 \wedge d(o_1^1, o_1^0); O_2 \supset o_2 \wedge d(o_2^1, o_2^0); O_n \supset o_n \wedge d(o_n^1, o_n^0);$ $T_1 \supset t_1 \wedge d(t_1^1, t_1^0); T_2 \supset t_2 \wedge d(t_2^1, t_2^0); T_n \supset t_n \wedge d(t_n^1, t_n^0);$ $R_1 \supset r_1 \wedge d(r_1^1, r_1^0); R_2 \supset r_2 \wedge d(r_2^1, r_2^0); R_n \supset r_n \wedge d(r_n^1, r_n^0);$ $E_1 \supset e_1 \wedge d(e_1^1, e_1^0); E_2 \supset e_2 \wedge d(e_2^1, e_2^0); E_n \supset e_n \wedge d(e_n^1, e_n^0);$ $W_1 \supset w_1 \wedge d(w_1^1, w_1^0); W_2 \supset w_2 \wedge d(w_2^1, w_2^0); W_n \supset w_n \wedge d(w_n^1, w_n^0);$ $Q_1 \supset q_1 \wedge d(q_1^1, q_1^0); Q_2 \supset q_2 \wedge d(q_2^1, q_2^0); Q_n \supset q_n \wedge d(q_n^1, q_n^0)$
Lower level	$P_1 \supset p_1 \wedge d(p_1^1, p_1^0); P_2 \supset p_2 \wedge d(p_2^1, p_2^0); P_n \supset p_n \wedge d(p_n^1, p_n^0);$ $L_1 \supset l_1 \wedge d(l_1^1, l_1^0); L_2 \supset l_2 \wedge d(l_2^1, l_2^0); L_n \supset l_n \wedge d(l_n^1, l_n^0);$ $K_1 \supset k_1 \wedge d(k_1^1, k_1^0); K_2 \supset k_2 \wedge d(k_2^1, k_2^0); K_n \supset k_n \wedge d(k_n^1, k_n^0);$ $G_1 \supset g_1 \wedge d(g_1^1, g_1^0); G_2 \supset g_2 \wedge d(g_2^1, g_2^0); G_n \supset g_n \wedge d(g_n^1, g_n^0);$ $B_1 \supset b_1 \wedge d(b_1^1, b_1^0); B_2 \supset b_2 \wedge d(b_2^1, b_2^0); B_n \supset b_n \wedge d(b_n^1, b_n^0);$ $S_1 \supset s_1 \wedge d(s_1^1, s_1^0); S_2 \supset s_2 \wedge d(s_2^1, s_2^0); S_n \supset s_n \wedge d(s_n^1, s_n^0);$ $A_1 \supset a_1 \wedge d(a_1^1, a_1^0); A_2 \supset a_2 \wedge d(a_2^1, a_2^0); A_n \supset a_n \wedge d(a_n^1, a_n^0);$ $V_1 \supset v_1 \wedge d(v_1^1, v_1^0); V_2 \supset v_2 \wedge d(v_2^1, v_2^0); V_n \supset v_n \wedge d(v_n^1, v_n^0);$ $M_1 \supset m_1 \wedge d(m_1^1, m_1^0); M_2 \supset m_2 \wedge d(m_2^1, m_2^0); M_n \supset m_n \wedge d(m_n^1, m_n^0)$

Metric spaces of the morphological graphs of the middle and lower bank management levels are presented in Table 1.

Symbols:

$I_1, I_2, I_n, J_1, J_2, J_n, U_1, U_2, U_n, O_1, O_2, O_n, T_1, T_2, T_n, R_1, R_2, R_n, E_1, E_2, E_n, W_1, W_2, W_n, Q_1, Q_2, Q_n$

– metric space of ODBMS at the middle management level;

$P_1, P_2, P_n, L_1, L_2, L_n, K_1, K_2, K_n, G_1, G_2, G_n, B_1, B_2, B_n, S_1, S_2, S_n, A_1, A_2, A_n, V_1, V_2, V_n, M_1, M_2, M_n$

– metric space of ODBMS at the lower management level.

As a result of empirical and expert research, types of organizational development are identified in terms of constructing organizational management structures that are most common in the BMS (Table 2). The conducted studies have shown that the largest average number of structural divisions and the number of their employees are presented in banks with a combined organizational management structure as the main component of the organizational development. More than half of the management organizational structures belong to the combined (matrix structure) ones.

The analysis of ODBMS also reveals the connection between relative shares of general and functional structural divisions of banks with the certain level of automation of bank customer service (Internet-banking).

Table 2. Types of the organizational structures in the BMS for January 1, 2018

Classification features and types of management organizational structures	Relative shares, %
1) Type of construction:	
• linear	14
• functional	20
• combined	66
2) Duration of using:	
• temporary	69
• permanent	31
3) Life cycle stage:	
• structures at the creation stage	12
• structures at the stage of restructuring	69
• structures at termination stage	19
4) Integration level:	
• fragmentary integrated structures	71
• fully integrated structures	29

Note: The table is formed based on the empirical data of banks and the results of expert research.

The construction of matrix structures allows obtaining synergistic effects in all sectors of the BMS under implementing the steps for bank customer service improvement. As a result of the conducted studies, the level of automation of the banking services has a significant effect on the ratio of shares of general and functional structural divisions in the BMS. The higher the level of the internet banking is, the bigger the number of general structural departments and the smaller the number of employees of functional structural divisions are. This conclusion applies to all banks, regardless of their size. If the duration of functioning is considered, most organizational management structures are temporary. Despite the fact that the frequency of organizational changes is a sign of the ODBMS mobility, most of them are rarely variable. In general, the management organizational structures are fragmentarily integrated, but this integration is temporary. Fully integrated management structures are presented in banks that are part of some associations.

The factors that affect the organizational development are:

1) the nature of the bank's business;
2) the organizational form in which the bank is founded;
3) the bank size;
4) goals;
5) the development level of Internet banking;
6) the bank integration in the economic structures;
7) legislation;
8) professional level of bank managers, their vision, beliefs, and ambitions;
9) staff quality of bank departments;
10) the level of competition and the state of market conditions.

According to the research results, it is proved that the factors have to be classified according to several features (in terms of content, nature, a force of influence, correlation, a source of origin, level of regulation). In the list of identified factors, the most significant are factors 3 and 4, as well as factor 8. In turn, 9 and 10 factors are not as significant as others. Information about the relationship between factors is important for making organizational decisions, as well as for identifying rationalization reserves for organizational management structures as a result of the reorganization.

Apparently, the BMSs consist of two interconnected patterns of organizational development – the model of creation and the model of reorganization. The difference between them is connected to the time periods of their application and im-

plementation conditions. Analysis of empirical data of banks showed that adaptation to changing of the internal and external conditions is the most common form of banking organizational structures reorganization. The study summarizes that adaptive organizational solutions typically leads to the creation of a new bank branch; integration of a new department to an existing division of the bank; liquidation of an existing unit in the bank; association of two or more divisions of the bank. Each of these solutions is accompanied by a redistribution of functions between the divisions of the bank and individual officials, rearranging goals, adjusting existing rules and procedures or developing new ones.

From the positions of mathematical logic and set theory, organizational development (if the form of building an organizational structure of the bank's management is considered) is a continuum of organizational changes that take place based on:

1) the axiom of accession:

$$\forall\left\{\begin{matrix}n\\A_x\\x=1\end{matrix}\right\}\forall\left\{\begin{matrix}m\\B_y\\y=1\end{matrix}\right\}\exists\left\{\begin{matrix}z\\C_i\\i=1\end{matrix}\right\}\forall\left\{\begin{matrix}r\\D_j\\j=1\end{matrix}\right\}$$
$$\left[\left\{\begin{matrix}r\\D_j\\j=1\end{matrix}\right\}\in\left\{\begin{matrix}z\\C_i\\i=1\end{matrix}\right\}\leftrightarrow\left\{\begin{matrix}r\\D_j\\j=1\end{matrix}\right\}\in\left\{\begin{matrix}n\\A_x\\x=1\end{matrix}\right\}\wedge\left\{\begin{matrix}r\\D_j\\j=1\end{matrix}\right\}\in\left\{\begin{matrix}m\\B_y\\y=1\end{matrix}\right\}\right], \quad (9)$$

where

$\left\{\begin{matrix}n\\A_x\\x=1\end{matrix}\right\}$ – set of elements x, which form a division A;

n – number of elements x;

$\left\{\begin{matrix}m\\B_y\\y=1\end{matrix}\right\}$ – set of elements y, which form a division B;

m – number of elements y;

$\left\{\begin{matrix}z\\C_i\\i=1\end{matrix}\right\}$ – set of elements i, which form the divisions A and B, and which are a part of the structure C;

z – number of elements i;

$\left\{\begin{matrix}r\\D_j\\j=1\end{matrix}\right\}$ – set of elements j, which form a division D, components C;

r – number of j;

2) the axiom of infinity:

$$\exists\left\{\begin{matrix}h\\R_v\\v=1\end{matrix}\right\}\left(\varnothing\in\left\{\begin{matrix}h\\R_v\\v=1\end{matrix}\right\}\wedge\forall v\left(v\in\left\{\begin{matrix}h\\R_v\\v=1\end{matrix}\right\}\rightarrow v\cup\left\{\begin{matrix}g\\V_o\\o=1\end{matrix}\right\}\in\left\{\begin{matrix}h\\R_v\\v=1\end{matrix}\right\}\right)\right);$$
$$v\cup\left\{\begin{matrix}g\\V_o\\o=1\end{matrix}\right\}\equiv\left\{e:e\in v\vee e\equiv v\right\}, \quad (10)$$

where

$\left\{\begin{matrix}h\\R_v\\v=1\end{matrix}\right\}$ – a set in management bank structure that includes empty set of elements;

v – an any element $\left\{\begin{matrix}h\\R_v\\v=1\end{matrix}\right\}$;

$\left\{\begin{matrix}g\\V_o\\o=1\end{matrix}\right\}$ – a set that consists of one element of the set $\left\{\begin{matrix}h\\R_v\\v=1\end{matrix}\right\}$;

e – singleton;

3) the axiom of inclusion:

$$\left\{\begin{matrix}j\\X_i\\i=1\end{matrix}\right\}\setminus\left(\left\{\begin{matrix}n\\A_x\\x=1\end{matrix}\right\}\wedge\left\{\begin{matrix}m\\B_y\\y=1\end{matrix}\right\}\right)\equiv$$
$$\equiv\left\{i\mid i\in\left\{\begin{matrix}j\\X_i\\i=1\end{matrix}\right\}\wedge i\notin\left(\left\{\begin{matrix}n\\A_x\\x=1\end{matrix}\right\}\wedge\left\{\begin{matrix}m\\B_y\\y=1\end{matrix}\right\}\right)\right\}, \quad (11)$$

where $\left\{\begin{matrix}j\\X_i\\i=1\end{matrix}\right\}$ – a set of elements i, which create a new department;

4) the axiom of allocation:

$$\forall\left\{\begin{matrix}w\\N_k\\k=1\end{matrix}\right\}\exists\left(\left\{\begin{matrix}n\\A_x\\x=1\end{matrix}\right\}\wedge\left\{\begin{matrix}m\\B_y\\y=1\end{matrix}\right\}\right)\forall$$
$$\forall\left\{\begin{matrix}z\\C_i\\i=1\end{matrix}\right\}\left(\left\{\begin{matrix}z\\C_i\\i=1\end{matrix}\right\}\in\left(\left\{\begin{matrix}n\\A_x\\x=1\end{matrix}\right\}\wedge\left\{\begin{matrix}m\\B_y\\y=1\end{matrix}\right\}\right)\Leftrightarrow\right. \quad (12)$$
$$\left.\Leftrightarrow\left\{\begin{matrix}z\\C_i\\i=1\end{matrix}\right\}\in\left\{\begin{matrix}w\\N_k\\k=1\end{matrix}\right\}\wedge F\left(\left\{\begin{matrix}z\\C_i\\i=1\end{matrix}\right\}\right)\right),$$

where $F\left(\left\{\begin{matrix}z\\C_i\\i=1\end{matrix}\right\}\right)$ – signs of $\left\{\begin{matrix}z\\C_i\\i=1\end{matrix}\right\}$, which are different from other sets of the Boolean;

5) the axiom of union:

$$\left\{\begin{matrix}n\\A_x\\x=1\end{matrix}\right\}\cup\left\{\begin{matrix}m\\B_y\\y=1\end{matrix}\right\}\equiv\bigcup\left\{\begin{matrix}f\\L_q\\q=1\end{matrix}\right\}, \quad (13)$$

where $\bigcup\left\{\begin{matrix}f\\L_q\\q=1\end{matrix}\right\}$ – sets union, which is the consequence of integration of the two bank divisions into one;

6) the axiom of intersection:

$$\left\{\begin{matrix}n\\A_x\\x=1\end{matrix}\right\}\cap\left\{\begin{matrix}m\\B_y\\y=1\end{matrix}\right\}\to\left\{\begin{matrix}z\\C_i\\i=1\end{matrix}\right\};\left\{\begin{matrix}n\\A_x\\x=1\end{matrix}\right\}\cap\left\{\begin{matrix}m\\B_y\\y=1\end{matrix}\right\}\equiv$$
$$\equiv\left\{i\,|\,i\in\left\{\begin{matrix}n\\A_x\\x=1\end{matrix}\right\}\wedge i\in\left\{\begin{matrix}m\\B_y\\y=1\end{matrix}\right\}\right\}. \quad (14)$$

The research of MBS analytical findings showed that the necessity for reorganization indicates the inability of the bank organizational structure to provide the sufficient level of subordination between officials and employees of structural units, as well as the inability of structural units to perform the functions assigned to them, which makes the realization of goals impossible. The common basis for these features is that the bank organizational structure is not a single factor that affects the goal implementation. The goals of the bank organizational development, the management organizational structure and its structural units are congruent. This explains why the criterion of the necessity to implement the reorganization model in the BMS has to be considered like a level of the chosen goals realization. According to the research results, a matrix has been constructed to interpret the values of coefficients that characterize the ODBMS according to the criterion of the goals implementation. The values of the coefficients in the matrix can be used to prove the necessity to apply the reorganization model.

The analysis of basic and chain increments of changes in the values of coefficients that characterize the ODBMS according to the criterion for the goals implementation is completed by synthesis of the results and the conclusion about the necessity for the reorganization model application.

If the goals and indicators are congruent, it is possible to calculate the indicator of the ODBMS mobility. It will show how the change in the management organizational structure affects the indicators of organizational development of the bank.

The capacity of the management organizational structure of the bank before reorganization can be written as follows:

$$\#\left\{\begin{matrix}w\\N_k\\k=1\end{matrix}\right\}\therefore\left(\#\left\{\begin{matrix}n\\A_x\\x=1\end{matrix}\right\}\le\#\left\{\begin{matrix}m\\B_y\\y=1\end{matrix}\right\}\wedge\#\left\{\begin{matrix}m\\B_y\\y=1\end{matrix}\right\}\le\#\left\{\begin{matrix}n\\A_x\\x=1\end{matrix}\right\}\right)\Rightarrow$$
$$\Rightarrow\#\left\{\begin{matrix}n\\A_x\\x=1\end{matrix}\right\}\equiv\#\left\{\begin{matrix}m\\B_y\\y=1\end{matrix}\right\}, \quad (15)$$

where $\#\left\{\begin{matrix}w\\N_k\\k=1\end{matrix}\right\}$ – the capacity of the management organizational structure of the bank;

$\#\left\{\begin{matrix}n\\A_x\\x=1\end{matrix}\right\}$ – the capacity of the set x that forms a division A;

$\#\left\{\begin{matrix}m\\B_y\\y=1\end{matrix}\right\}$ – the capacity of the set y that forms a division B.

Monofunctional changes of $\#\left\{\begin{matrix}w\\N_k\\k=1\end{matrix}\right\}$ can be conducted depending on the content of the reorganization (usually it happens after the reorganization). Based on the dynamic range $\#\left\{\begin{matrix}w\\N_k\\k=1\end{matrix}\right\}$, it is possible to calculate the mobility indicator of the management organizational structure of the bank. In order to solve this task, a formula presented below has to be used:

$$K_m=\sum_{i=1}^{n}Z_i;Z_i\equiv\#\left\{\begin{matrix}w\\N_k\\k=1\end{matrix}\right\}_i\setminus\#\left\{\begin{matrix}w\\N_k\\k=1\end{matrix}\right\}_o, \quad (16)$$

where K_m – mobility indicator of the ODBMS;

$\sum_{i=1}^{n}Z_i$ – number of changes in the organizational structure of the bank that changed its capacity during an i time period;

n – number of the time periods;

$\#\left\{\begin{matrix}w\\N_k\\k=1\end{matrix}\right\}_i$ – the capacity of the management organizational structure of the bank during the i time period;

$\#\left\{\begin{matrix}w\\N_k\\k=1\end{matrix}\right\}_o$ – the capacity of the management organizational structure of the bank at the beginning of the bank activity.

This indicator has to be used only when combined with indicators of the organizational development of the bank. If the correlation between this indicator and other (number of implemented innovations, the share of personnel involved in the new ideas generation, the level of Internet banking implementation, etc.) ones is revealed, it is possible to construct analytical and reciprocal models, which will demonstrate how much the current organizational structure meets the needs of the bank, how its reorganization affects the ODBMS.

4. DISCUSSION

Empirical studies have shown that the matrix organizational structures are acceptable for the emergence of synergistic effects. They appear because matrix structures have some typical components (linear and functional relationships) that are duplicated with other components. That is, once developing an algorithm for building some component of the organizational structure of the bank's management, it can be used in the future to duplicate such other similar components, which will save time and money, and hence it leads to the synergy effects emergence. In addition, it has been proven that the matrix organizational structures can be built not only by types of projects but also for differentiation of geographical or food product, that is, they are a set of fractals. Fractal using as a property of the matrix organizational structures to increase their scale contributes to the growth of time reserves for the formation of organizational structure. If this phenomenon is accompanied by an increase in indicators that characterize the bank's organizational development, it means an appearing of the synergetic effects.

CONCLUSION

The presented method of the morphological analysis is based on the consideration of ODBMS from the position of the hierarchical levels, which are analyzed as topological and metric spaces. As a result, the identifying the connections in the structure of the sets is possible and it contributes to the increase in the content analysis quality and synthesis of the ODBMS, which is important during organizational decision making, constructing an organigrams in the BMS, analysis of the reserves for increasing the rationality of their building, presenting the arguments for necessity of changes implementation, which take place during the organizational development of banks.

It has been proved that organizational development, as the phenomenon in the BMS, has the nature of the continuum set. According to this, the organizational development includes several organizational operations, the essence of which is the inclusion, the infinity, the involving, the allocation, the merging and the intersection of the components of the bank organizational structures. Implementation of the presented ideas contributes to the increase of rationality during the decision making process.

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