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COMPATIBILITY OF THE TOOLS OF COST MANAGEMENT IN BUSINESS ORGANIZATIONS

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Abstract: *The article examines the methodological aspects of the compatibility of cost management tools in business structures. There is revealed a holistic view of the problems of knowledge and use of cost management tools. A direct relationship between the size of the entrepreneurial structure and the level of awareness of its specialists about cost management tools is revealed. It is shown that among the most well-known cost management tools are budgeting and operational analysis. It is proved that the experts responsible for cost management are more familiar with such tool as budgeting and direct costing. Advantages and disadvantages of cost management systems in business structures are revealed. The article empirically proved that the most significant indicator of an effective system of cost management is having a clear cost planning. The methodological tools of cost management tools compatibility and their connection with the efficiency of business structures are proposed.*

Keywords: *management tools, costs, planning, business structure, efficiency of activity*

INTRODUCTION

A holistic vision of the problem of formation the methodical tools of cost management

For the developed empirical proof of influence of the basic tools of cost management on efficiency of activity of enterprise structures, there was carried out an applied research. The study investigated another feature of the use of cost management tools in business structures, namely the need for their combined use and the relationship of certain combinations of tools with performance indicators.

The main purpose of the study was to determine the availability of cost management tools for business structures, and the impact of the use of different combinations of these tools on the effectiveness of activities.

To achieve this goal in the research process there were solved the following tasks:

1) todetermine which tools of cost management are the most applicable in business organizations today;
2) toanalyze the readiness of business structures to use certain tools of cost management;
3) toidentify which combinations of specialized cost management tools affect the efficiency of business structures.

The study was conducted using the following methods: questionnaire method and analysis of economic indicators of business entities activity.

The survey method allowed obtaining statistically significant information about the list of cost management tools used in business structures of various sizes. The data source for the analysis of economic performance indicators of business structures was the database – the system of professional analysis of the market and companies (SPARK), from which the indicators of profitability of sales of the studied business structures were taken.

The volume of sample was 100 business entities, where 46 are small, 34 are medium and 20 are large business entities.In this study, the division of

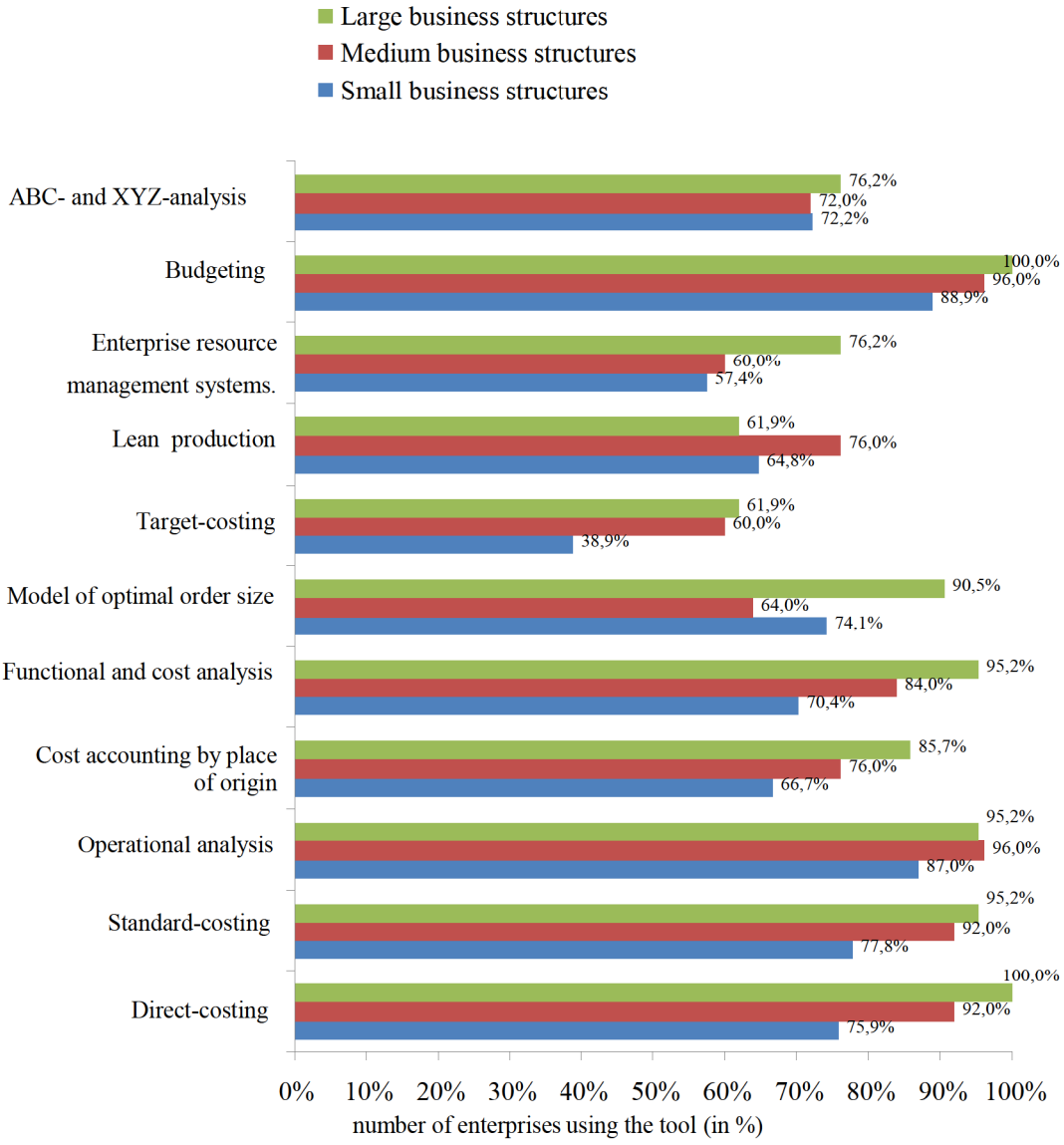
business structures into small, medium and large was carried out by one indicator – the number of personnel. Small businesses have less than 100 employees, medium -101-250 employees, large- more than 250 employees.

To assess the awareness of respondents about the existence of various tools of cost management, we used two indicators: the tool is familiar and the tool is not familiar. To identify those cost management tools that are used in business structures, two indicators were used: the tool is used and the tool is not used.

THEORETICAL RESEARCH

Knowledge and use of cost management tools

In general, respondents showed wide awareness of specialized cost management tools (Pic. 1). There is a direct correlation between the size of the business structure and the level of awareness of its specialists about cost management tools



Picture 1. Knowledge of cost management tools

The most well-known cost management tools for representatives of small, medium and large business structures are budgeting and operational analysis. 100% of specialists responsible for cost management in large business structures are

familiar with such as tools budgeting and direct costing, what was quite predictable.

It is interesting that less than 80% of specialists responsible for cost management in business structures are familiar with the ABC-analysis method, also known as Pareto principle, despite the fact that it is available even in the basic version of 1C system, which is used by most business structures.

The range of tools that small, medium and large business entities are familiar with varies. This is due to the fact that business structures of different size need different tools to manage costs.

Data on the use of cost management tools (Pic. 2) are of the greatest interest. For the majority (11 out of 14) of the indicators, there is a direct correlation between the size of the entrepreneurial structure and the number of cost management tools it uses.The exception is the ABC - and XYZ-analysis and lean production. It should be noted that awareness of the lean production, ABC and XYZ analysis tools also does not depend directly on the size of the business structure, which may indicate that there is no sampling error. We investigate consistently the possible causes of the above facts.

1. Probably, specialists of small, medium and large business structures have different understandings of such instruments as "lean production", "ABC-analysis" and "XYZ-analysis". Specialists of small and medium business structures noted the use of these tools even if they used only some of their elements, and representatives of large business organizations have noted the use of these instruments only in the case when they used them as a full concept. This assumption was confirmed in a sample interview, in which respondents were interviewed on the most unpredictable results of the study.

2. ABC-analysis and XYZ-analysis are the most frequently used in small business structures (second place) and rarely used in medium and large structures. Perhaps this can be explained by the fact that the medium and large business structures, considering this tool as "basic", did not allocate it separately.

In large and medium-sized businesses, there are significantly more different cost management tools than in small businesses. This is due to the fact that large and medium-sized businesses have a more complex cost structure, which requires more tools to manage them. Small business structures often control their costson an intuitive level.

The methods most frequently used in small business structures are operational analysis (63,0% of firms), ABC - and XYZ-analysis (38,9%), budgeting and standard-costing (37,0%).

The set of cost management tools used in medium-sized and large business structures differs from those used in small businesses. So 84,0% of medium business structures apply standard costing, 76,0% – budgeting and 72,0% - direct costing. 90, 5% of large business structures use budgeting, 85,7% – standard-costing, 81,0% – direct-costing (Pic. 2).

To confirm the hypothesis that the size of the business structure affects the number of cost management tools used, we will conduct a Mann-Whitney test.

U-Mann-Whitney criterion is a statistical nonparametric criterion used to estimate differences between two samples by the level of any trait measured quantitatively. It allows identifying differences in the parameter value between small samples. The criterion does not require the normality of data distribution (Kaplan & Norton, 2003).

To apply the Mann-Whitney U-test, there is a need to perform the following operations.

1. To create a single array from both matched samples, arranging the elements according to the degree of increase of the symptom and attributing a lesser value of the smaller rank.The total number of ranks will be equal to: N = n1 + n2, where n1 — the number of units in the first sample, and n2 — the number of units in the second sample.
2. Divide a single ranked row into two, consisting respectively of units of the first and second samples. Calculate separately the sum of the ranks, which fell on the share of the first sample, and separately-on the share of the second sample. Determine the larger of the two rank sums (Tx) corresponding to a sample with nx units.
3. To determine the value of U-Mann — Whitney test according to the formula:

$$U = n_1 \cdot n_2 + \frac{n_1 \cdot (n_2 + 1)}{2} - T_x \qquad (1)$$

where: n1 - the number of units in the first sample;

n2 — the number of units in the second sample;

Tx is the largest of the two rank sums.

4. If the null hypothesis is valid, the criterion has a mathematical expectation :

$$M(U) = \frac{n_1 \cdot n_2}{2} \quad (2)$$

where: n1 - the number of units in the first sample;

n2 — the number of units in the second sample;

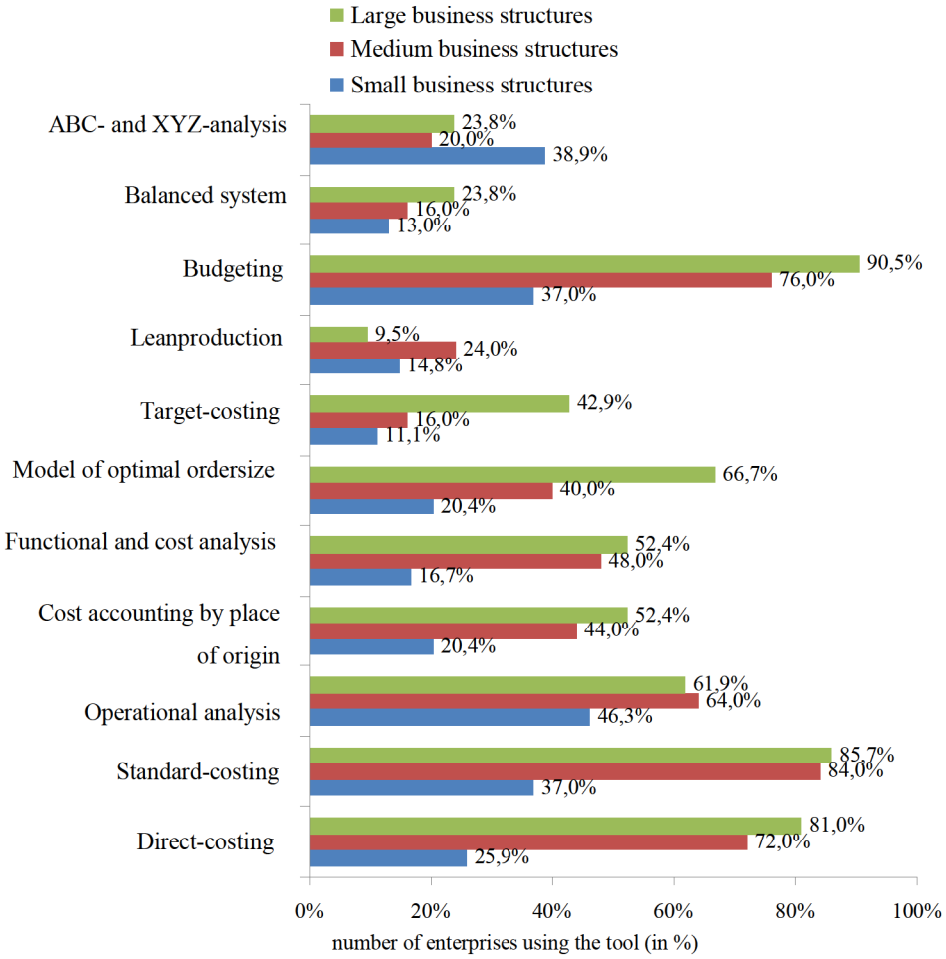
and variance $D(U)$:

$$D(U) = \frac{n_1 \cdot n_2 \cdot (n_1 + n_2)}{12} \quad (3)$$

where: n1 - the number of units in the first sample;

n2 — the number of units in the second sample;

and for a sufficiently large volume of sample data (n1>19, n2>19) almost normally distributed (Kaplan & Norton, 2003).



Picture 2. Use of the cost management tools

The above coefficient values show that the use of certain cost management tools is due to the size of the business structure. The difference is statistically significant (table 1).

Table 1. The value of coefficient of Mann-Whitney for various tools of cost management (criterion – the size of the business structure)

The tool of cost management	Valueofcoefficient	Statisticalsignificance (p)
Direct-costing	603,0	p<0,001
Standardcosting	612,0	p<0,001
Operationalanalysis	1039,0	p<0,001
Cost accounting by place of origin	742,0	p<0,001
Functionalandcostanalysis	662,0	p<0,001
The model of optimal order size	672,5	p<0,001
Target-costing	486,0	p<0,001
Leanproduction	666,0	p<0,001
Humanresourcemanagement	648,0	p<0,001
Budgeting	614,0	p<0,001
ABC-and XYZ-analysis	866,5	p<0,001

Advantages and disadvantages of cost management systems in business structures

According to 14% of respondents, the main problem in cost management is the lack of clear planning. 11,0% indicated that there was no clear system for managing costs, while 10,0% noted that insufficient attention was paid to the issue. It is interesting that every second respondent could not name shortcomings in the cost management system of the entrepreneurial structure in which he works.

According to 23,0% of respondents, the main advantage of the existing cost management system in their entrepreneurial structure is clear planning and full cost accounting, 7,0% noted the availability of a budgeting system.

Thus, the most significant indicator of an effective cost management system (from the point of view of specialists of business structures) is the existence of a clear cost planning, because its absence is called mainly a disadvantage, and its presence is mainly an advantage.

RESEARCH RESULTS

Compatibility of cost management tools and their relationship with the efficiency of business structures

The study revealed the impact of the use of individual cost management tools on the efficiency of business structures. However, for more precise dependencies, there were considered not individual tools, but their combinations, since it is the set of tools that determines the effectiveness.

With this purpose we investigated: what are the tools of cost management that are most commonly used in a certain combination and how this affects the efficiency of functioning of enterprise structures.

The results of the analysis are presented in table 2. The tools are arranged vertically in accordance with their individual impact on the effectiveness of business structures, and horizontally there are presented complementary tools in accordance with the highest synergistic effect of their joint use.

The results of the study showed that business structures using the concept of "lean production" work most effectively. Further analysis showed that businesses can achieve the greatest success in case of using lean manufacturing together withwell-defined methods. Thus, they manage to significantly improve efficiency, using together with lean production such tools as "ABC - and XYZ-analysis", "enterprise resource management systems", "budgeting" and "target-costing".

Table 2. Group of cost management tools that complement each other most effectively

№	Costmanagementtools	Complementary tools				
1	Leanproduction	ABC - and XYZ - analysis	Resource management system of the enterprise	Budgeting	Target-costing	Model of optimal order size
2	ABC - and XYZ - analysis	Leanproduction	Cost accounting by place of origin	Target-costing	Operationalanalysis	Resource management system of the enterprise
3	Resource management system of the enterprise	Leanproduction	Operationalanalysis	ABC - and XYZ - analysis	Cost accounting by place of origin	Functionalandcostanalysis
4	Cost accounting by place of origin	ABC - and XYZ - analysis	Leanproduction	Resource management system of the enterprise	Model of optimal order size	Budgeting
5	Model of optimal order size	Leanproduction	Resource management system of the enterprise	Cost accounting by place of origin	Target-costing	ABC - and XYZ - analysis
6	Budgeting	Leanproduction	Resource management system of the enterprise	ABC - and XYZ - analysis	Operationalanalysis	Cost accounting by place of origin
7	Standard-costing	Leanproduction	ABC - and XYZ - analysis	Resource management system of the enterprise	Operationalanalysis	Cost accounting by place of origin
8	Opcrationalanalysis	ABC - and XYZ - analysis	Resource management system of the enterprise	Lcanproduction	Targct-costing	Budgcting
9	Target-costing	Leanproduction	ABC - and XYZ - analysis	Operationalanalysis	Model of optimal order size	Resource management system of the enterprise
10	Functionalandcostanalysis	Resource management system of the enterprise	ABC - and XYZ - analysis	Target-costing	Leanproduction	Operationalanalysis
11	Direct-costing	Leanproduction	ABC - and XYZ - analysis	Cost accounting by place of origin	Operationalanalysis	Target-costing

According to the results of the study, among the instrumental factors of business structures efficiency the ABC - and XYZ-the analysis is in second place after the lean production. A business structure that uses ABC- and XYZ-analysis, have an average sales profitability at the level of 11,78% (using lean manufacturing – 12,95%). It is not surprising that the set of complementary instruments, allowing achieving a positive synergetic effect, in this case is very close to a similar set of lean production concept. However, the structure of effective supplements to ABC - and XYZ-analysis has some differences from the same structure in the concept of lean production. For example, according to the results of the study, ABC- and XYZ-analyses are effectively complemented by cost accounting by place of origin. This is quitc logical, bccausc in ordcr to effectively use cost accounting by place of origin, detailed information about all elements of product price formation is necessary, so ABC-analysis and XYZ-analysis are effective complementary methods to cost accounting by place of origin.

The task of the enterprise resource management system is to provide management with objective and complete information about the functioning of the business structure(Liberman, 2006). Of course, the use of the lean production concept in conjunction with the enterprise resource management system will contribute to improving the efficiency of business structures. In order to obtain objective and relevant information, it is expedient to use operational analysis, and the enterprise resource management system to allow a comprehensive analysis of the effectiveness of certain actions. A complex tool such as an enterprise resource management system cannot be effectively used in an enterprise structure whose managers do not analyze performance. Hence, the basic tool for such analysis is operational analysis (Schumpeter, 2008) Entrepreneurial structures that

use budgeting clearly understand the structure of their business and, therefore, can afford to use the tools of the Japanese management system, to which can be attributed the lean production.

Effective use of the tool "cost accounting by place of origin" requires detailed information on all elements of the formation of the price of products, so effectivecomplementary methods to the cost accounting by place of origin are ABC-analysis and XYZ-analysis.In many business structures, the introduction of cost accounting at the place of origin has grown into a means of improving operations by managing the bearers of the cost-generating functions. It is not surprising, therefore, that business entities have made significant strides, taking into account the costs of lean manufacturing, enterprise resource management systems and the optimal order size model.

The model of optimal order size allows building a balanced policy towards suppliers and reasonable approach to the proposals for modification of the conditions of supply. The study showed that the model of optimal order size is effectively combined with such tools as "lean production", "enterprise resource management system", "cost accounting at the place of origin".

Budgeting is a key tool for planning and control, which has a significant impact on the level of performance of business entities. The study revealed that business structures achieve the best results using tools such as "lean manufacturing", "cost accounting by place of origin", "enterprise resource management systems" and "functional and cost analysis"in conjunction with budgeting. Business structures that use budgeting have a much higher level of cost control than other business structures. This is well correlated with the fact that cost accounting by place of origin is used in business structures, which, in turn, apply budgeting. Entrepreneurial structures that use budgeting clearly understand the structure of their business and, therefore, can afford to use the tools of the Japanese management system, to which, with known reservations, the tool “lean production” can be attributed. Budgeting makes it possible to identify and monitor factors affecting the cost of production, so it is not surprising that business structures are making significant progress, using, along with budgeting, functional and cost analysis.

It is noteworthy that the standard-costing, along with operational analysis, refers to the most commonly used methods. It is not surprising that the set of tools used in addition to standard-costing and affecting the efficiency of business structures is similar to the corresponding set of operational analysis.

The study showed that business structures using operational analysis work most effectively. It is noteworthy that the use of lean production without the use of operational analysis does not allow businesses to achieve a significant result. This can be explained by the fact that the use of this method is associated with a certain ability of business structures to analyze the results of their activities and take corrective measures on the basis of this analysis. Complex tools such as enterprise resource management and cost accounting at the place of origin cannot be effectively used in business structures whose managers do not analyze performance (Golokteev&Matveev, 2008).The basic tool for such analysis is operational analysis.

In order to use the target-costingthere is a need to analyze information from the external environment and information within the enterprise structure, which can be done with the help of tools such as ABC-analysis, XYZ-analysis and operational analysis. It is not surprising that the use of these tools in conjunction with target-costing allows businesses to increase the effectiveness of their activities. The task of functional and cost analysis is to achieve the highest consumer properties of products while reducing all types of production costs. Undoubtedly, the use of lean production in conjunction with functional and cost analysis contributes to improving the efficiency of business structures. In order to obtain objective and relevant information for functional and cost analysis, it is advisable to use ABC-and XYZ-analysis, and the enterprise resource management system will allow analyzing the effectiveness of various actions in a comprehensive manner. Despite the fact that direct-costing is the most popular among all cost management tools, its application is not a significant factor in improving the efficiency of business structures. However, the use of certain tools simultaneously with the direct-costing allows increasing the efficiency of business structures. These tools include: "lean manufacturing", "ABC-analysis" and "XYZ-analysis", "cost accounting by place of origin", "operational analysis", "target-costing". To prove the hypothesis that the more different cost management tools an enterprise structure uses, the higher its performance evaluation, Pearson's correlation analysis is used.

Pearson's coefficient is calculated by the following formula:

$$r = \frac{\sum_{i=1}^{n} (x_1 - \bar{x}) \times (y_i - \bar{y})}{(n-1) \cdot S_x \cdot S_y} \qquad (4)$$

where x_i and y_i - the values of two variables, $\bar{x}$ and $\bar{y}$ - their means, S_x and S_y - their standard deviations, n - number of pairs of values.

Pearson correlation coefficient is equal to 0.418 at $p<0.001$, what confirms the hypothesis.

The obtained results make it possible to select the most effective combination of cost management tools for business structures of different sizes with a high degree of probability.

CONCLUSION

Thus, costs, their size and structure have a significant impact on the competitiveness of both the product and the entrepreneurial structure that produces it. Proper cost management helps to reduce the cost of production and to obtain on this basis competitive advantages. The results of the study showed that the use of a set of special cost management tools increases the efficiency of the business structure. In order to achieve synergy, instruments that complement each other in the most effective manner should be used. When deciding on the implementation of certain cost management tools, it is necessary to take into account the logical sequence of their implementation, the compatibility of tools, as well as the individual characteristics of a particular business structure.

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SUMMARY

Considerable part of the instruments of management of expenses containing innovative components in the basis or do not reach implementation, or in fact brings much less advantage, than was planned. One of the reasons of these tendencies is in absence at the head of real tools on planning, assessment and control over expenses. In article it is offered the methodical tools of compatibility of instruments of management of expenses and their influences on efficiency of activity of enterprise structures based on the analysis of both internal opportunities, and external competitive forces, search of ways of use of external opportunities taking into account specifics of enterprise structure. Process of compatibility of instruments of management of expenses is guided by the set of rules, the principles, standards, algorithms of use of set of tools for achievement of definite purposes and tasks, allows to diagnose and analyze information on expenses by means of the special system of tools, facilitating decision-making on management of expenses. It also supports group of methods which use allows heads of enterprise structures to provide quick response to change of an external environment. Treat such methods: strategic segmentation; solution of problems in real time; diagnostics of strategic availability for service in the conditions of the future; development of the general plan of management of expenses; planning of an enterprise position of firm; strategic transformation of enterprise structure. A specific place is held by specific methods of a research: method of questioning and analysis of economic indicators of activity of enterprise structures. Process of compatibility of instruments of management of expenses is presented in the form of the open list which is turning on 11 key instruments of management of expenses, each of which provides dynamics of development of enterprise structure. The offer of transition to use of such tools which more supplement each other, and which in the conceptual basis, are guided by specific features of concrete enterprise structures, search of ways of expeditious overcoming the arising changes, organizational difficulties and unpredictability of convertibility of an external environment is result of the system of compatibility of instruments of management of expenses developed by the author. The received results are a basis of justification of the tool approach to management of expenses allowing to open intrinsic characteristics of system of instruments of management of expenses, to define the main requirements and rules to its formation. Application of tool approach allows to prove a role of management of expenses as tool value and means of achievement of target economic results of business activity.