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Adaptive Management Decision-Making Tool in the Field of Regulation of Interaction of Subjects Participating in a Cluster of Regional Economic System

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ABSTRACT

The study authors identify the priority use of the cluster approach to the management of enterprises in the social and economic development of territories at the expense synergies from the combination of various enterprises and improve the quality and competitiveness of the manufacturing process. The study found that the clusters in regional economic systems of the Russian Federation are innovation-oriented production and the economy, based on cutting-edge world experience in science and technology that can create products with high added value is in demand, to provide the advantages of the opportunities that it gives the globalization of the world economy. However, the detection of the leading cluster and the planning of their formation and development, in particular in goal-setting in the cluster must be considered and the boundaries and parametric characteristics scale vector strategies regional economic system.

Keywords: Cluster, Regional Economy, Management Decisions
JEL Classifications: G1, P25

1. INTRODUCTION

Undoubted importance in the framework of the management of the cluster takes on the development of innovative approaches, primarily intended for the implementation of quality new level of management of the companies in the cluster at the level of the regional economic system. For the practical implementation of these cluster approaches in the study was developed adaptive tool management solutions interaction of subjects in the cluster, wearing preventive (warning) character. Under the preventive nature of the system refers to measures to prevent the development of negative trends in the financial management of spatially localized economic systems (clusters) and enable timely response to changing conditions external and internal environment, ensuring the implementation of the strategic plans of companies in the cluster at the regional economic system.

2. RESEARCH METHODOLOGY

Theoretical and methodological basis of the research were works of domestic and foreign scholars in the field of fundamental problems of regional economic development, control theory presented in the scientific literature as well as works of local researchers on the development of cluster management technology. In developing problems using different methodological approaches, including a systematic approach to its subject-object-structural and functional aspects; methods and instrumentation technology research, statistical methods, the method of peer review; the method of the strengths, weaknesses, opportunities and threats-analysis; tabular and graphical data visualization techniques, the use that will ensure the validity of theoretical propositions and arguments conclusions.

The working hypothesis of the research is the assumption that the effective operation and development of economic systems

in a cluster, as the configuration of stable interdependent and reproducing economic relations based on the effect of synergetic efficiency and enhancing competitive advantages, due to the need for development and verification of the organizational and economic instruments of cluster management based on sectoral and regional specificities of the territories of justification of algorithms creation (Shkurkin et al., 2015) of enterprises cluster type.

3. MAIN PART

Putting the problem associated with the development of the cluster management tools, it is worth noting that it is based should be focused evaluation system integrated diagnostics activities of the enterprises in the cluster. This circumstance is due to the need for early detection of negative trends in the management of both financial and labor, production and other resources.

The proposed instrument cluster management is a holistic system of measures consisting of interrelated components, united by common theoretical, tactical and organizational and methodological objectives (Rodríguez-Garzón et al., 2015).

The main conceptual provisions of the adaptive management decision-making tools include the following:

- Diagnostics of the crisis should not be limited to the financial component, and should include an assessment of personnel, production capacity, as well as evaluation of internal and external marketing environment.
- Identification of negative trends at lower cost and losses avoided in the early stages of their discovery.
- The organization of the diagnostic system depends on the timeliness and quality of management decision-making in the field of cluster management.

The choice of priorities in the development of the cluster management tools be based on the following objectives:

- Identification of the crisis in the activities of enterprises in the cluster, in the early stages.
- Assessment of the extent and depth of the crisis.
- The development of measures to prevent the further development of the crisis.

In accordance with the tools developed by the cluster management offers a number of these areas to create an efficient system of "preventive" measures management of a cluster of regional economic system.

1. Block: Identification of diagnostic operation and detail.
2. Unit: Development of an algorithm implementing the system diagnostics of the crisis and the system of preventive measures to prevent them.
3. Unit: The development of the financial program of cluster development in the light of the diagnosis.

We characterize the content of each of the above blocks that make up the cluster model of strategic management (Rədulescu et al., 2015). In our view, the direction of the diagnosis should contain an assessment not only to the financial component of the activities of enterprises in the cluster. As noted earlier, there is a dependence on the financial stability of the qualifications of administrative staff, so-called "flow of knowledge" within the cluster; availability of modern production technology and a low degree of deterioration of equipment; the availability of the system of budgeting and so on.

Summarizing the foregoing comparison, in the general direction of a comprehensive diagnosis of the functioning of the cluster can be represented by the scheme shown in Figure 1. The next block - the development of an algorithm implementing the system of diagnosis of the crisis and the system of preventive measures to prevent them (Figure 2).

In our opinion, such an algorithm for implementing the system of diagnosis of the crisis and the system of preventive measures to prevent them in the cluster might look like block shown in Figure 2.

Of particular importance in the strategic management of the enterprises belonging to the cluster gets a clear assignment of tasks and division of powers between the employees. This eliminates the misunderstanding that may arise between the CFO and leading specialists: Chief accountant, head of planning and economic department, head of the finance department and the head of analytical department of the companies belonging to the cluster (Moshabaki et al., 2013). This is especially true of the chief accountant, as the accounting of the enterprise should be mandatory part of the financial services, and the chief accountant must be in double subordination: Director General (in accordance with applicable law) and Chief Financial Officer on all operational matters. Only under this condition management in real time the activity of the enterprises in the cluster to be effective, otherwise the analytical work will be meaningless.

Developing tools cluster management thesis research highlighted that the interaction of structural (economic and financial) business units within the cluster might look scheme, reflected in Figure 3.

A detailed description of the interaction of structural divisions of financial services in the management of enterprise cluster in the structure of the regional economic system is presented in Table 1.

In the first step should be to identify the persons responsible for the monitoring, to develop a position on each of the services, and make changes to job descriptions.

In addition, you should determine the frequency of the diagnosis in all areas of the company, part of the cluster. In our opinion, it is appropriate to conduct diagnostics on a quarterly basis in the following areas: Marketing activities, production capacity, human resources. In the field of finance diagnostics should be performed monthly (Volodin, 2006).

Describing the content of the second stage, it may be noted that for each of the areas to be developed criteria by which to infer the presence or occurrence of problem areas such in the near future. So, for those of financial performance may be negative trends in the dynamics at the stage when the critical values of the indicators have not yet been achieved.

Figure 1: Areas of complex diagnostics functioning cluster

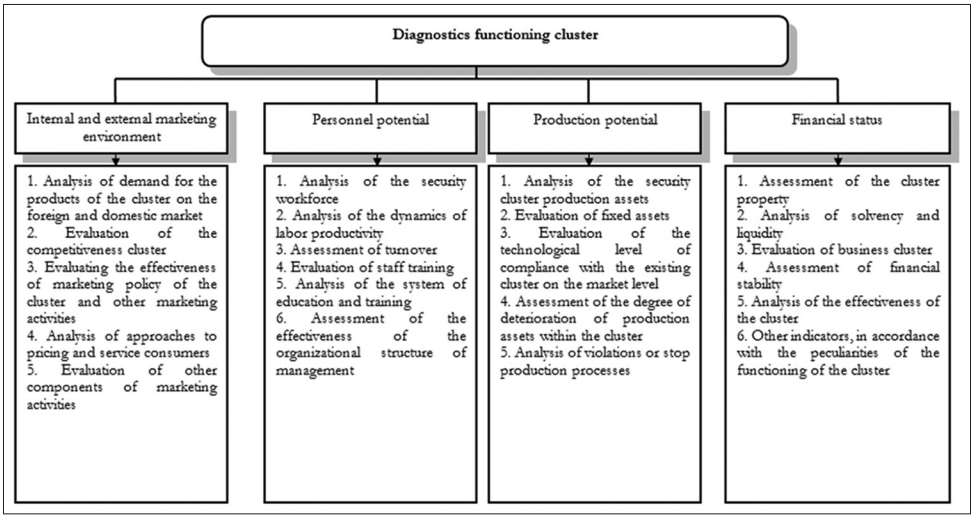


Figure 2: Algorithm for implementation of the system diagnostics of the crisis and the system of preventive measures to prevent them in the agribusiness cluster

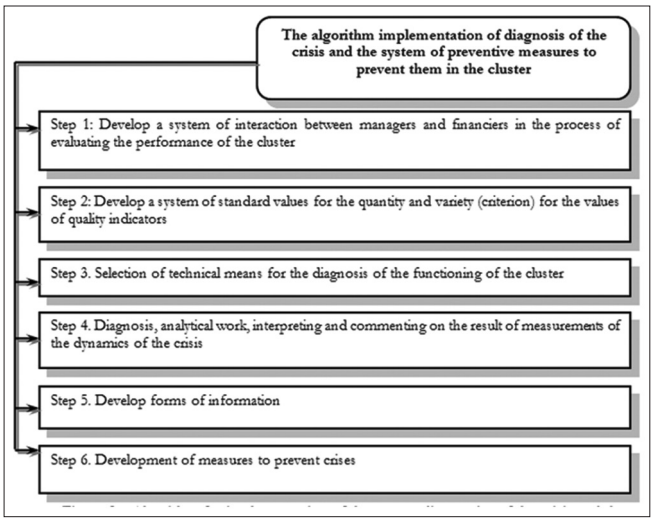
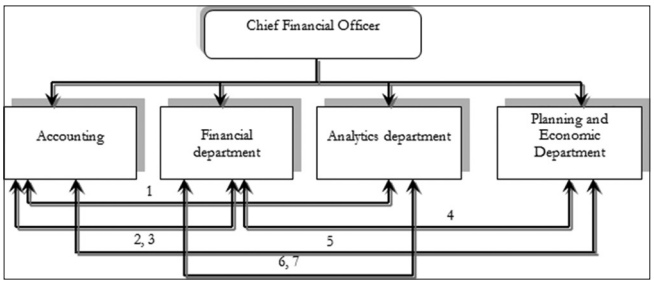


Figure 3: Scheme of interaction of divisions of financial services companies in the cluster



(1) The organization of the financial analysis of the enterprise cluster as a whole, and financial stability; (2) management of accounts receivable and accounts payable; (3) cash management; (4) financial planning and budgeting; (5) cost management; (6) financial risk management; (7) investment management and development of dividend policy

Equally important in the analysis of the technical base of the company is included in the cluster. This is the choice of equipment, such as computer hardware, software, creating a unified information network for users. This problem should be solved on the third stage of implementation of the system diagnostics.

It is also advisable to develop forms of information (in our case - the fourth stage). Information should be provided in a convenient form that employees of other divisions could have an idea of the situation in this area of functioning of the enterprise, part of the cluster.

At the fifth - the final stage of each company, based on the specifics of its operation, is developing a system of measures for each of the areas.

The next block is to develop a financial program of cluster development. Financial planning should be based on operational information that companies belonging to the cluster, obtained by diagnosing its functioning and proposed measures to prevent negative trends. Development programs can be written in the form of the circuit shown in Figure 4.

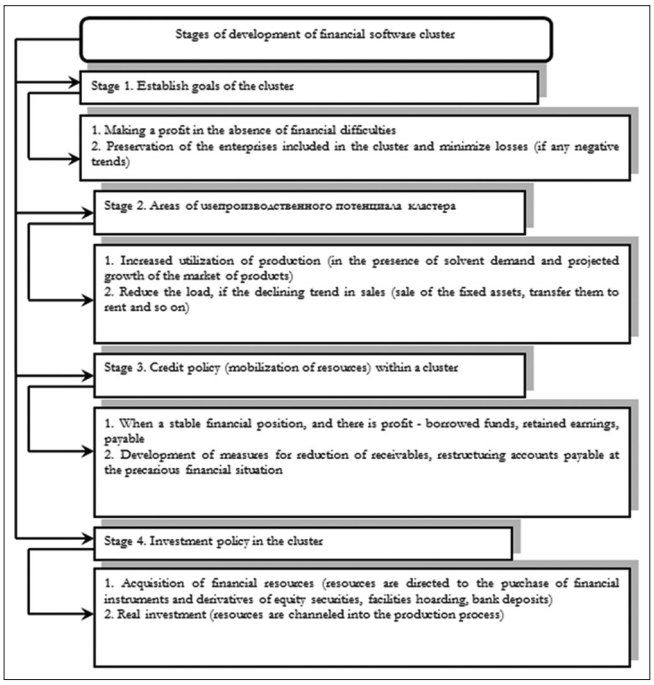
From the author's point of view, for the development stages of the financial program cluster, you must choose the two extreme positions - the lack of financial constraints and their availability. In practice, any company included in the cluster, it is difficult to imagine a situation when the company has no financial difficulties. Sooner or later a situation arises that requires close attention. Only with constant monitoring of the operation of enterprises in the cluster, and strict regulation of control measures for timely detection of adverse trends and immediate response to their presence. The earlier the problem is identified and operational decision-making, the more likely cluster to survive in a market economy, characterized by high level of competition.

Given the instability of the environment in which the cluster operates at the regional level, particular attention, in our view, should be given to the organization of preventive (preventive) monitoring the state of financial resources.

Table 1: The interaction of structural units in the management of companies in the cluster

Name of business processes within the cluster	Executive in charge	Who agrees	Statement	Period of execution
Organization of the financial analysis of the company	Head of planning and economic department or the chief economist	Chief accountant	Chief financial officer	At the end of each week
Receivables management (development of measures to reduce)	Specialists of financial department	Head of financial department	Chief financial officer	Monthly
Receivables Management (analysis of the value, quality and dynamics)	An employee of the analytical department	Chief accountant	Chief financial officer	At the end of each week
Manage accounts payable (development of measures to reduce)	Specialists of financial department	Head of financial department	Chief financial officer	Monthly
Manage accounts payable (analysis of the value, quality and dynamics)	An employee of the analytical department	Chief accountant	Chief financial officer	At the end of each week
Cash management (analysis of outflow, inflow, and others)	An employee of the analytical department	Chief accountant	Chief financial officer	At the end of each week
Cash management (decision-making in the areas of the use of funds)	Specialists of financial department	Head of financial department	Chief financial officer	At the end of each week
Decision-making in the field of financial planning	Specialists of economic planning, finance and accounting department	Head of planning and economic department	Chief financial officer	Depending on the timing of the planning
Cost management (development of regulatory calculations, the development of measures to optimize the amount of expenses, etc.)	Specialists of planning and economic department	Chief accountant	Chief financial officer	Monthly
Financial risk management	Specialists of financial department	Head of financial department	Chief financial officer	Quarterly
Investment management and development of dividend policy	Specialists of financial department	Head of financial department	Chief financial officer	Yearly

Figure 4: The stages of development of financial software cluster



According to leading experts in the field of financial management, financial control is an effective coordination system to ensure the relationship between the formation of the knowledge base, financial analysis and financial planning, providing control of the financial activities and financial transactions.

Hasanov follows determines the subject and object of financial control "subject to financial control in enterprises are the processes of formation and use of financial resources, and subject to control - controls the activity of which is directly linked to these processes" (Hasanov, 2003).

Typically, as the priority tasks of financial control experts in the field of financial management stands to ensure a high efficiency of the enterprise and to maintain a normal level of financial stability.

Kuzaeva identifies the following local problems of financial control:

- Ensuring a normal level of solvency and liquidity
- Creation of a system of indicators of financial information
- Control of key financial indicators
- Monitoring of the cash flow
- Tax control
- Control of capital investments (Kuzaeva, 2006).

According to Steven, the main areas of financial control are transactions with cash; management decisions related to investment activities; state of accounts payable; state of accounts receivable; costs of production and circulation (Hasanov, 2003; Steven, 2008).

Given the need to implement the objective of financial control in the strategic management of financial resources of the cluster, you can add an area such as financial planning and budgeting.

It should be noted that under the stewardship role of the financial control continues unabated. Any decision related to the management of financial resources, must be assessed, including from the standpoint of its impact on the financial position of companies belonging to the cluster, their financial stability. In this case also assumes the use of the financial control.

We distinguish, in a study that the financial control function in the strategic management of the cluster might look like:

- Monitoring of the progress of administrative decisions in the field of financial management companies within the cluster.
- Measurement deviations of actual financial performance of the planned;
- Diagnosis of abnormalities in the financial consequences of the development of enterprises in the cluster.
- The development of management solutions to remedy the situation to normalize the financial condition of the companies belonging to the cluster.
- Making (if necessary) adjustments to certain goals and objectives, as well as financial indicators related to the changes in the internal and external business environment.

There is no doubt that the financial control within the management of the cluster must be based on certain principles. These include:

1. The focus of the system of financial control in the implementation of the financial strategy of the companies belonging to the cluster.
   Each of the financial transactions carried out should be evaluated in terms of impact on the financial stability to its implementation, i.e., Financial control must be strategic.
   Financial control of all current financial transactions makes little sense, since it will be a simple statement of the facts when making decisions in the field of financial management will be carried out after the event.
2. Timeliness of financial control.
   Financial control should wear primarily precautionary (preventive) character, i.e., allows you to fix the financial position of the company to the point where the current abnormalities can lead to serious consequences.
3. The adequacy of the financial control features of the functioning of enterprises in the cluster.
   When building a system of financial control should take into account industry specific cluster, its size and the conditions of its operation. In addition, the current selection is a certain financial ratios and financial ratios with which it would be possible to assess the financial position of the company, part of the cluster, and its financial stability and which would take into account the specifics of its activities.
4. Flexibility of construction of system of financial control in the cluster.
   The system of financial control must respond and adapt to the changing internal and external factors. For example, to new types and forms of investment, operational and financial performance, new financial instruments, new methods and technologies in financial transactions.
5. Cost-effective system of financial control.
   The financial effect of the introduction of the system of financial control in the strategic management of the cluster must exceed the costs of its organization.

In our opinion, the system of financial control in the strategic management of the cluster must be built as follows:

1. Definition of the object of financial control - in this case the value perspective of financial stability of enterprises in the cluster.
2. Formation of controlled performance. As already mentioned, the choice of the system parameters must be tailored to the specifics of operation of the cluster. This capability is the selection of priority indicators and the indicators of the second level in order to clarify the value of forward-looking financial stability of enterprises in the cluster.
3. Development of the quantitative standards for the system controlled parameters. Following the development of appropriate indicators is controlled to set limits performance, again taking into account the peculiarities of the cluster.
4. Determination of the control periods, it is advisable to set the reference periods of the same period of financial planning and budgeting. We can distinguish the following periods: Weekly report; monthly report; quarterly and annual reports.
5. Establish the size of the actual deviations from targets. You can select the following deviations:
   - Positive deviation (financial transactions were carried out with less financial risk and largely contributed to the strengthening of financial stability).
   - Tolerance of negative (financial stability of enterprises in the cluster below the planned level, but remain within acceptable limits - there is no threat of bankruptcy);
   - Critical negative deviation (enterprises belonging to the cluster threaten financial problems until its bankruptcy).
6. Identification of the causes of deviations. For each deviation, regardless of its type (positive or negative) must be set causes: In the first case (positive deviation) - to secure the effect obtained in the second - to prevent recurrence in the future.
7. Formation algorithm of actions to address deviations. You can select the following fundamental system of actions of managers, which is carried out in the framework of the three algorithms.
   - "Do nothing" - this algorithm is appropriate to apply in the case where the deviation is positive or is negative, but the size of the deviation is far from critical.
   - "Elimination of consequences" - the algorithm suggests actions to address the effects that have arisen as a result of significant negative deviations from the planned targets. Events are developed depending on the reasons which caused a high amount of negative deviations.
   - "Change of routine or standard indicators" - in some cases, the reasons for the deviations do not allow change the situation by eliminating the consequences. For example, the rate of growth of prices for raw materials was higher than the projected level. In this case the variant, at which the correction targets. In some extreme cases, it can be taken crucial decisions, such as the rejection of the implementation of operational, financial and investment companies, until the closure of certain production facilities, if it is economically justified.

On the basis of studies to determine the place of preventive control within the model of cluster management. Any economic process can be represented as a managerial cycle. Start cycle - setting goals and objectives, and the end of the cycle - their implementation. After that, put a new goal and a new cycle begins. Formula management process is as follows: "The objective - the result - a new goal."

Implementation is carried out by managerial cycle of strategic and tactical planning, which is embodied in the budgets of the cluster.

The budget is a financial instrument created to implement proposed actions. It forecast the future financial operations.

Budget, first - a development plan for the cluster in terms of money, and secondly - it means and sources of funding to achieve the strategic and operational objectives.

In our view, the feasibility of organizing preventive controls in the model cluster management within the budgeting system of enterprises in the cluster.

Here are the basic principles of the process of budget planning, formulated by Tilova:

1. The ratio of the financial terms ("golden banking rule") - the receipt and use of funds should take place on time. Capital investments for the long term it is advisable to be financed by long-term borrowings.
2. To ensure solvency and financial stability - financial planning must ensure the solvency of the company and its financial stability in all phases of operations.
3. The optimal capital investment - for capital investments necessary to choose the cheapest means of financing (for example, financial leasing). Attract bank loans is beneficial only if the action is provided by the effect of financial leverage.
4. The balance of risks - the most risky long-term investments it is advisable to fund from its own sources.
5. Compliance with the conditions and needs of the market - for the enterprise must take into account the market situation, the actual demand for the products (services), and possible reaction to changes in the market.
6. The marginal profitability - it is advisable to choose the objects and investment areas that provide maximum (limit) profitability.

As one of the key principles is called the principle of solvency and financial stability. Inclusion in the budgeting system of preventive control over the financial stability of the enterprises included in the cluster will facilitate the implementation of this principle (Kobersy et al., 2015).

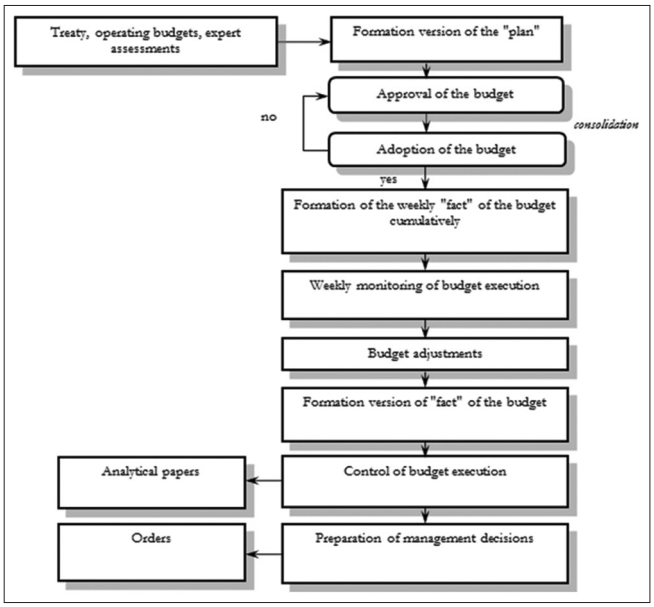
In the most general form of the process of drawing up any budget is as follows:

- Training version of the "plan" of the budget
- Approval of the proposed budget
- Approval of the proposed version of the budget
- Formation version of the "fact" of the budget
- Budgetary control
- The adjustment budget.

As can be seen from the above position, the control function is shown only from the standpoint of the effectiveness of implementation of the budget. In this case, the circuit budgeting process within a cluster, in the most general form is shown in Figure 5.

Topical is refinement of the budgeting process in order to implement the control function from the standpoint of assessing

Figure 5: Stages of the budget process for the formation and control of the budget execution in the implementation of models of cluster management



the financial stability and solvency of the companies belonging to the cluster.

The budgeting process is advantageously carried out three types of monitoring financial stability of the enterprises in the cluster:

1. Preliminary review of financial stability is to evaluate the financial stability of the company at the stage of approval of budgets, performance targets and compliance with standard values.
2. Monitoring is to verify the correspondence between the decisions are made and approved plans.
3. Follow-up of financial stability of the company is to verify the conformity of the actual and plan data.

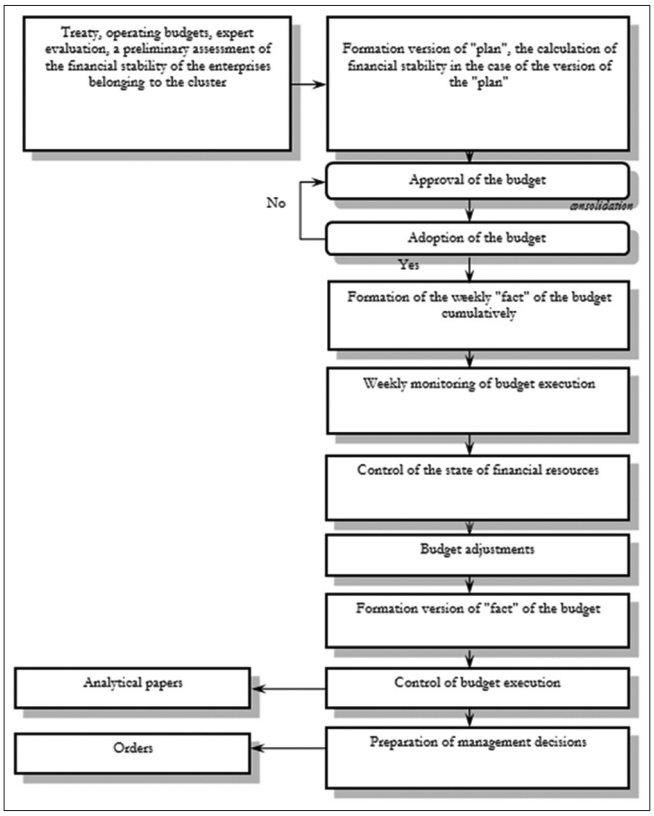
Therefore, we recommend the use of precautionary (preventive) control within the budgeting system in the implementation of models of cluster management. In the process of implementation of the budget will be implemented as the current and subsequent checks (Di Pietro, 2015).

In this case, the stage of the budget process within the framework of the formation of the forecast balance of the enterprises included in the cluster would look as follows: Preliminary review of financial stability of enterprises; training version of the "plan" of the budget; monitors the financial stability of enterprises in the case of the version of the "plan;" approval of the proposed budget; approval of the proposed version of the budget; the formation of the version of "fact" of the budget; budgetary control; subsequent control of the financial stability of the enterprises; adjustment of the budget.

In view of the tool in the implementation of cluster management scheme of the budget process will be as follows (Figure 6).

The key elements of the system of preventive monitoring of financial stability within the cluster budgeting system will be:

Figure 6: Stages of the budget process for the formation and control of implementation of the budget taking into account the monitoring of financial stability of enterprises in the cluster



- Preventive control facilities - forecast balance of enterprises in the cluster.
- Control subjects - heads of departments and economic and financial services companies within the cluster.
- Methods of preventive control budgets - the implementation of procedures to determine the deviation of actual financial soundness indicators of the plan.

In this case, the system of preventive control is not accidental implemented within the formation of the forecast balance, in fact balance data are the basis for the information to assess the financial stability of the cluster.

Thus, the consistent implementation of tools cluster management, in the author's view, will not only carry out preventive monitoring of the activities of each entity in the cluster, but also to forecast its activities on a long term basis, monitor the implementation of the budget within the cluster, to carry out activities aimed at minimizing financial risks associated with the peculiarities of the industry development of various businesses.

4. CONCLUSION

On the basis of analysis of the issues discussed in this section of the study, the following conclusions:

1. The preventive control of the cluster means a system of measures that prevent the development of negative tendencies in the field of financial management and allow timely response to the changing conditions of the external and internal environment, thus ensuring the implementation of the strategic plans of companies in the cluster.
2. The proposed instrument cluster management is a holistic system of measures consisting of interrelated components, united by common theoretical, tactical and organizational and methodological objectives.
3. In accordance with the developed tool offers a number of directions to create an efficient system of "preventive" measures to manage the activities of the cluster, combined in blocks. The first block - definition of areas of operation and diagnostics of detail; second unit - the development of diagnostic algorithm implementation of the crisis and the system of preventive measures to prevent them; the third block - the development of the financial program of cluster development in the light of the diagnosis.
4. Only with continuous monitoring of the operation of enterprises in the cluster, and strict regulation of control measures for timely detection of adverse trends and immediate response to their presence. The earlier the problem is identified and operational decision-making, the more likely cluster to survive in a market economy, characterized by high level of competition.
5. Implementation of the managerial cycle is carried out through strategic and tactical planning, which is embodied in the budgets of the cluster.
6. The system of preventive control is not accidental implemented within the formation of the forecast balance, in fact balance data are the basis for the information to assess the financial stability of the cluster.
7. Consistent implementation of cluster management tools will not only carry out preventive monitoring of the activities of each entity in the cluster, but also to forecast its activities in the long term, the budget execution in the cluster, to carry out activities aimed at minimizing financial risks associated with the peculiarities industry development of various businesses.

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