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DESCRIPTORS OF MODULAR FORMATION OF ACCOUNTING AND ANALYTICAL CLUSTER IN INNOVATION DEVELOPMENT OF AGRICULTURAL HOLDINGS

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Abstract

In the context of the division of accounting into financial accounting, taxation accounting, management accounting and statistical accounting a problem of improving their relationship arises. The accounting and analytical cluster plays the role of the correlating factor of the relationship between the subdivisions of the agricultural holding property. To improve its work a modular principle of its building based on information technology was introduced. Practical implementation of modular accounting and analytical cluster revealed its shortcomings. They were as follows: each type of account and each production unit used its own natural and cost parameters. The number and nature of these parameters were different. To eliminate the shortcomings in the information security of managers and specialists of the agricultural holding, we attempt to develop a methodology for establishing a rational number of descriptors (binding parameters) for each module. The proposed descriptors are designed on the basis of validity of the methodological approach to their calculations and legal support. The proposed method allowed to limit the asymmetric information in all kinds of records, to improve its quality and to bring a synergistic effect from the scale and structure of the use of the agricultural holdings property complex.

Keywords: Agribusiness, Agricultural Holding, Accounting and Analytical Cluster, Innovation, Cluster Module Descriptors

1. Introduction

Russia has historically been an agricultural country and one of the largest producers and exporters of agricultural products. The agricultural sector of the country is various: production of cereals, vegetables, horticulture, fish farming and etc. However, over the past few decades, the country has started to act as an importer of agricultural products. The problems of the village are the most pressing ones in the modern Russian economy.

In Russia, as well as everywhere in the world, agricultural production is the largest life-sustaining sphere of the national economy (Epshtein *et al.* 2013) Its condition and cost-effectiveness of the operation have a decisive impact on the food security and welfare of the people. In recent years there have been a growth trend in agricultural development and acceleration in the overall growth rate of the economy as a whole. How strange it may sound, economic sanctions from Western countries have facilitated the growth of the agricultural economy.

There is strengthening of the equivalence in trade barter of agriculture with other sectors. Slowly, but steadily prices of energy and other material and technical resources are declining. The level of technical equipment of agriculture is increasing. The share of investment in fixed assets has increased by approximately 11.4% of the total investment in the economy. There has been a steady knowledge-intensive process of agribusiness development.

However, despite the measures taken by the Government, no cardinal changes have taken place in the agricultural sector or in its technical security yet because of the unsystematic activities. Currently, Russia's technical equipment is almost 5 times lower relative to the equipment of developed countries.

First of all, the machine fleet does not meet the needs of the agro-industrial complex in the number. For example, need for tractors is met by about 63%; for combine harvesters by 61%, for potato harvesters by 32%, for plows 53%, for tillers by 68%, for beet harvesting machinery by 59%, for mowers by 51%, and for fertilizing machines by 31%.

In addition, the machine fleet does not meet the needs either by the structure or the technical level. On 01/05/15, there were 58 % to 97% of serviceable vehicles in the parks. About 52% of tractors, 54% of combine harvesters have served for 10 years or more. The situation with other types of equipment is the same.

A very important challenge for agricultural development in the country is insufficient elaboration of the theory of management by economic agents of the agrarian market, which has different legal forms of ownership and different size. Nationwide, there are joint stock companies, limited liability companies, Municipal Unitary Enterprises, State Unitary Enterprises, sole proprietorships and peasant farms**.**

2. Analysis of the Functioning of Accounting and Analytical Cluster

In recent years there has been a steady process of forming large agricultural companies: agricultural holdings and agricultural units. These business entities are different. They own land resources (from 20,000 hectares to 150,000 hectares), have professionally trained human resources, control substantial financial flows, have a modern material and technical base.

The components of functioning of the entities mentioned above have been determined by the development of information systems, methods and management structure: a set of elements whose action ensures effective activities aimed at achieving the goal, which is the anticipation of the result (Popova, 2006). The art of leadership is the art of making the right choice of the triad management   in dynamically changing managerial situations. At the same time we must not forget that only the integrated use of triad management can provide synergistic efficacy.

The problems identified address the urgent issues related to the development and functioning of the agro-industrial complex of Russia and, in particular, the formation and functioning of accounting and analytical cluster as the main vector of innovative information security system for the management of agricultural holdings and agricultural units.

In the context of economic modernization increasing high-tech production is one of the basic requirements to ensure competitiveness (Govdya *et al.* 2014).
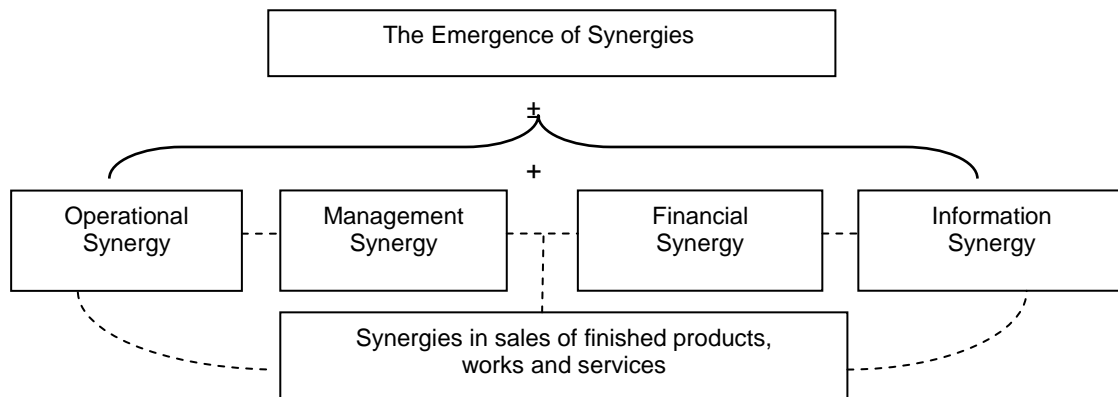
In this regard, the formation of industrial and innovation clusters that integrate science, technology and production, is a widely accepted method of providing scientific, technical and economic development at the meso and micro level.

Currently, synergy is understood as the science of self-organization in the systems of very different nature: physical, chemical, social, biological and economic.

In accordance with the basics of the theory of synergy, any system has the concept of emergence - discrepancy of the overall effect of actions of different mechanisms in the arithmetic sum of the effects and the action of the parts making up the whole.

Viewing the integrated group as a synergetic system suggests that the integration process should lead to the emergence of synergies, when revenues from sharing resources exceed the amount of income from the use of the same resources separately.

The synergies sources are as follows: financial synergies, operational synergies, synergies in sales, management synergy, synergy of information (Figure 1).

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│       The Emergence of Synergies      │
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         │ Synergies in sales of finished products, │
         │          works and services            │
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**Figure 1. Key Terms of the Agribusiness Cluster Synergies**

We can distinguish the following parameters to assess the potential realization of the positive synergies of the accounting and analytical and industrial clusters:

- the formation of rational technological and cooperative ties related to basic production processes within the added value chain, as well as consumers of cluster at both the regional and the national and international level;

- broad and intensive exchange of information, personnel, financial resources, innovation among all cluster members; organizations engaged in the production of the final product, involved in marketing activities, research organizations and educational institutions;

- realization of the production scale effect (including the solution to the problem of creating new capacity by restarting capacity of partners);

- investment capacity-building (at the expense of both their own and borrowed funds) and optimization of the investment programs, that consists of consistent concentration of resources in priority areas defined by the development of scientific and technical progress and market conditions;

- development of competitive advantages of enterprise clusters and on this basis increasing the proportion of goods sold in total sales on the market of similar products; increment of steadily controlled share of the market of integrated production structure;

- optimization of commodity and financial flows and financial calculations in the framework of agreements on joint activity of the participants of integration.

It is known that all information about the facts of economic life and the events of functioning of economic entities is formed in the account (Degaltseva, 2013). The traditional national system of accounting and control in modern conditions no longer copes with the flow of complex, diverse and multi-faceted information necessary to operate in market relations. Current economic conditions call for new methods and management tools focused on compliance with the economic interests of economic entities, greater use of international experience in the organization of accounting. Division of accounting into financial accounting, tax accounting, managerial accounting, statistical accounting, peculiarities of their functioning allow organizations to manage costs and results at all levels of the production process. However, each of these types of accounting forms its own specific information. This information differs in completeness of reflection of an event or a fact of economic life, it can characterize different time lag of its origin, have different quantitative and value terms. These and other factors degrade the quality of management information, lead to its growth, deepen uncertainty in choosing the alternative management decision in the use of the resource potential under conditions of its limitations. The paradigm of accounting and analytical cluster implementation must become creative and innovative and transformative management of an economic entity. Figure 2 shows the core modules of accounting and analytical cluster of the agricultural holding developed by us.

However, practical operation of the accounting and analytical cluster revealed some of its shortcomings. In particular, the weakness manifested in a weak cross-correlation of modules

of accounting and financial accounting and tax accounting; financial, tax accounting and managerial accounting, controlling, planning and budgeting at all levels of the economic system.
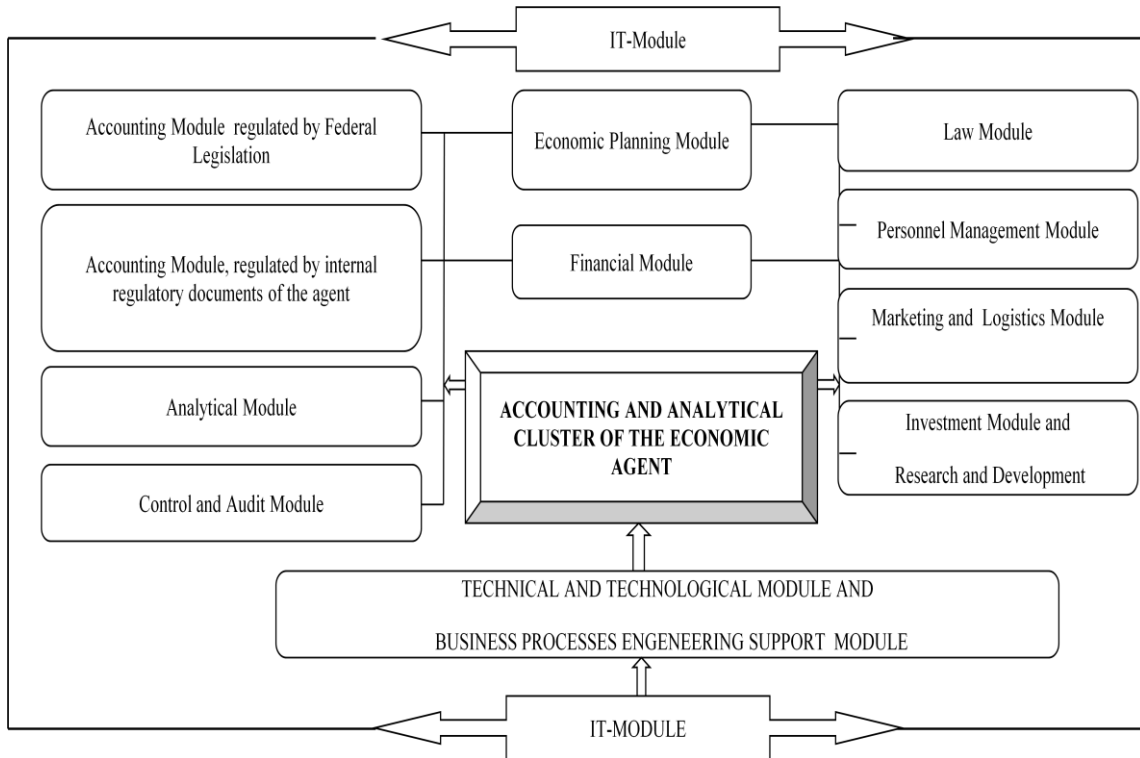
**Figure 2. The Modular Structure of Accounting and Analytical Cluster
of the Economic Agent**

The disadvantages are that economic agents of agricultural holdings and consolidated groups of economic agents used different techniques and technology in crop production, animal breeding and industrial processing, different systems of taxation, different forms of accounting and farm reporting and different software products for personal computers, different accounting methods of cost calculation and budgeting of finished goods, works and services, different levels of forecasting, planning, regulation, incentives and motivation of the personnel, and etc. (Govdya *et al.* 2013).

For example, in the Agro-Holding Kuban in Ust-Labinsk district of Krasnodar Krai various agricultural organizations (ZAO im., MI Kalinina and OAO Rassvet), being parts of the Agricultural Holding, determined the product cost of cereals, maize, sugar beet, milk and offspring cattle differently, used different versions of the account of expenses on maintenance and operation of the machine and tractor fleet, fleet of trucks. Moreover, these organizations used different cost classifications.

On combining property complexes, preparing a consolidated development program and financial statements, all figures had different economic content. It made no sense to analyze them and take managerial decisions on their basis.

In the first phase of the agricultural holding functioning this leads to such serious problems that sometimes the question arises whether they should have created such an organization at all, whether the team will be able to overcome the current difficulties and achieve the cherished goal of a synergistic effect, which has been declared by the constituent documents. Even if all the technical and technological, information, tax, accounting and analytical, economic planning, logistics, control problems are overcome, what will it cost?

Table 1. Classification of Descriptors of the Agroholding according to the Types

Types of Plans and Programs	Descriptors – Major Parameters
The volume of production of finished goods, works and services	1. The amount of products and services proposed for the sale (units) 2. Structure of production according to types of goods (services) (u, shares) 3. The level of production capacities (%)
The volume of sales of finished goods, works and services	1. Revenue (rubles) 2. The sale of certain goods 3. Structure of sales (%) 4. The rate of change in revenue by periods (%)
Marketing	1. Advertising expenditure according to types of promotional events and other types of promotional goods and services rubles) 2. The increase in revenues, income from promotional activities (rubles) 3. Costs for training tactical reviews (rubles) 4. Market Volume and market share of agricultural holdings on the market
Expenses and costs	1. The amount of costs in general, and the main items (rubles) 2. The level of costs, including conditional variables (%) 3. Cost Structure (%) 4. The unit cost of goods (works, services) (rubles) 5. The amount of costs to cost centers (rubles)
Labor and staff costs	1. The number of employees as a whole and by the main categories, occupation and qualification structure (units) 2. Labor productivity (rubles) 3. The intensity of labor and the rate of change (rubles) 4. The wages fund (rubles) 5. Average monthly salaries of the staff (rubles)
Revenues and profits	1. Total gross income (rubles) 2. Profit before tax (rubles) 3. Net profit (rubles) 4. The level of profitability (%)
Investment	1. Equity investments (rubles) 2. Loan investments (rubles) 3. Capital investments (rubles)
Taxes and levies	1. Taxable indicators (rubles) 2. Taxes by type (rubles)

We are faced with the task of eliminating these drawbacks. In this situation, the problem is solved by the application of the system of descriptors i.e. economic indicators, techniques, methodologies and tools for each type of the separate module of the accounting and analytical cluster.

3. The Modular Structure of Accounting and Analytical Cluster

The main requirement for descriptors is to organize the relationship between the various modules of accounting and analytical cluster (Table 1). With the help of descriptors the information formed in financial accounting will have the same economic content with the information generated in the managerial accounting, and vice versa.

In developing the module of financial accounting of the accounting and analytical cluster of the agricultural holding developers must clearly define the system of descriptors, i.e. the indicators that are necessary for all kinds of records, determine the methodology for calculating them, systematizing in accounting registers, as well as the algorithm of tracking in the accounts. This technique must be unified not only for all economic agents of the agricultural holding, but also for the use of these descriptors in tax accounting, managerial accounting, planning and budgeting, controlling.
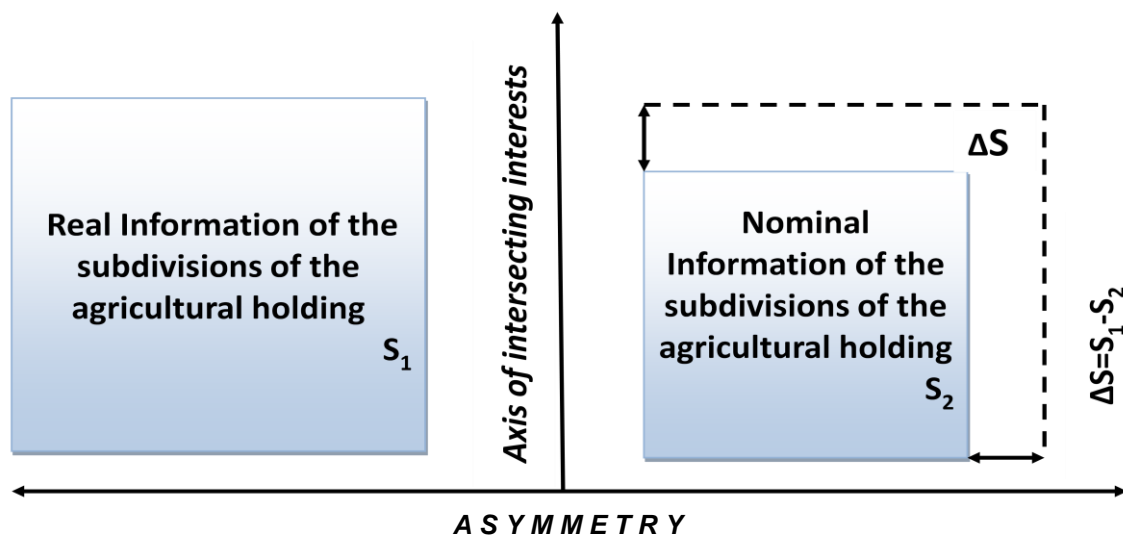
Figure 3. Presentation of Asymmetric Information in the Accounting and Analytical Cluster of the Agricultural Holding

For early detection of and minimizing the impact of asymmetric information on the economic activity of the agricultural holding, it is necessary to apply the system of targeted instruments. In the managerial accounting of the accounting and analytical cluster we have graphically defined asymmetric information (Figure 3).

A large amount of information may contain a small amount of relevant information, i.e. the amount of information does not depend on volume. We have provided information in the form where S1 is the information having an objective character and S2 is nominal (public) information.

In order to equalize the amount of information on the internal and external users we should add the part of relevant information. The volume of this portion can be determined by the formula:

$$\Delta S = S1 - S2$$

Thus, ΔS, carrying the missing amount of relevant information, is the number of descriptors that turn the information into the symmetric information.

There is a need to identify and minimize asymmetric information in the circuit of accounting and analytical cluster (Figure 4). The challenge is to get a rational volume of descriptors, which meets the needs of all users and is used in all kinds of accounting, as we have mentioned above.

To implement asymmetric information minimization mechanism in the accounting and analytical cluster we have developed a special register, which is based on a balanced system of descriptors.

Each group of descriptors is measured in percentage according to the level of importance (in the use in the management process).
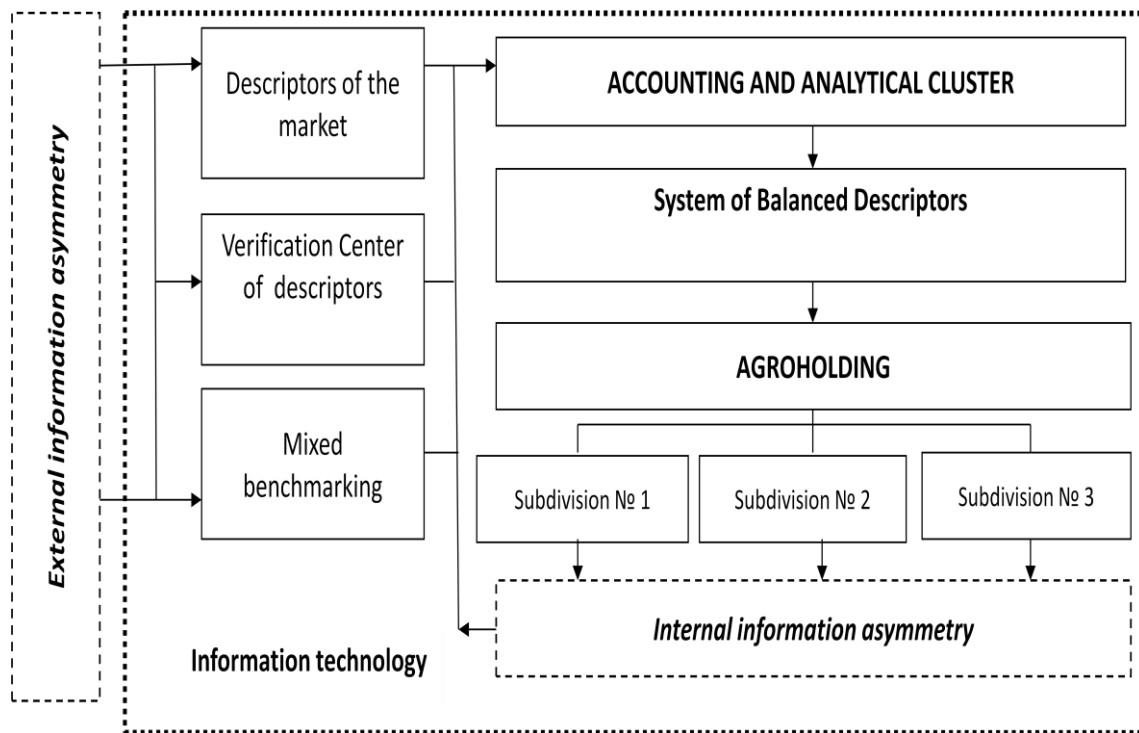
Figure 4. Asymmetric Information Minimization Mechanism

Subsequently it is necessary to identify deviations that we estimate in points for each group of descriptors. Deviation scale for each group is valid, ensuring legality, reliability and validity of the initial information:

- up to 5% - 5 points;
- from 5.1 to 10% - 10 points;
- from 10.1 to 15% - 15 points;
- from 15.1 to 20% - 20 points;
- 20.1% or more - 25 points.

Table 2 illustrates the calculations of asymmetric information on the separate modules of the accounting and analytical cluster (financial, clients, business processes, personnel). In the Agricultural Holding Kuban in Ust-Labinsk District, the total score for descriptors is 35. Therefore, all of the descriptors used in the Agricultural Holding Kuban fall into the group of middle-asymmetric descriptors (21-40 points).

Table 2. Register Identifying and Minimizing the Asymmetric Information in the Accounting and Analytical Cluster

Descriptors	Real Information (S_1)	Nominal Information (S_2)	Deviations (ΔS)	Deviations Score
Estimation Unit				
Finance (F)	F_1	F_2	F_3	$\sum_1^n F$
The proportion of full information on finance,%	100	91	9	10
Clients (C)	C_1	C_2	C_3	$\sum_1^n C$
The proportion of full information on clients,%	100	97	3	5
Business processes(I)	I_1	I_2	I_3	$\sum_1^n I$
The proportion of full information on business processes, %	100	86	14	15
Personnel (L)	L_1	L_2	L_3	$\sum_1^n L$
The proportion of full information on personnel,%	100	98	2	5
Total points for all groups				35
The maximum number of points for all descriptors				100
Estimation Unit				
I	20-30 points	The high level of asymmetry of descriptors		
II	31-40 points	The middle level of asymmetry of descriptors		
III	41-50 points	The low level of asymmetry of descriptors		
IV	51 points and more	Descriptors are asymmetric		
Analytical Building Block				
I	Information and analytical value and relevance of descriptors does not need to be corrected			
II	Monitoring and diagnostics of descriptors, the identification and elimination of deviations and inconsistencies is required			
III	Advanced monitoring and diagnostics of descriptors, checking calculation algorithms, Information flows analysis, correcting deficiencies			
IV	Comprehensive monitoring and diagnostics of descriptors. The revision of the organizational and management structure of agricultural holdings, the development of an adaptive system of descriptors.			

Therefore in the agroholdings it is required to introduce monitoring and diagnostics of descriptors, identification and elimination of deviations and discrepancies.

4. Conclusion

All in all, standardization and unification of accounting processes requires effective organization of agricultural production, active and consistent introduction of new and advanced methods of control of consolidated groups of economic agents of agribusiness. Under these circumstances, it is required not only to weigh the costs against the income received, but also actively seek for effective use of every ruble invested in the production activities of the organization. Achieving this goal involves the use of accounting and analytical cluster whose component modules are integrated into the system by the descriptors.

Using our proposed technique, users can select a rational number of descriptors that are adapted to each individual module registration-analytical cluster will facilitate obtaining only relevant symmetrical information.

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