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Efficient Management of Agro-Industry Cluster

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Abstract
This article shows ways to effectively manage an agro-industry cluster. Effective management of agro-industry cluster is based on digital management.

Keywords:
Cluster, agro-industry, digital management, efficient, marketing, innovation, information technology, system, automation, algorithm.

In the current period of rapid development in the new Uzbekistan, the comprehensive development of our country, that is, the development of the socio-economic and technical-technological spheres, is the most urgent issue today. One of the main ways to solve these urgent issues is to organize clusters and manage them efficiently. In particular, agro-industry clusters need to be digitized for effective management. President of the Republic of Uzbekistan Sh.M. Mirziyoyev's decree No. PF-60-79 "On the approval of the Digital Uzbekistan-2030 strategy and measures for its effective implementation" stipulates the transfer of enterprises and organizations in our country to digital management [1]. The role of digital management in effective solution of these tasks is incomparable. Digital management is a modern, versatile, highly capable tool that helps people improve all their activities. Digital management is becoming the main criterion for the success of social and economic sectors today. There is no single opinion about digital management among scientists and experts. Therefore, as a result of our research, we found it necessary to give the following definition of digital management. "Digital management is an electronic system for obtaining optimal results based on marketing, information technology, innovation, and employee activation." This definition can be illustrated as follows in the drawing (Fig. 1).

The goal is accomplished with the help of computer systems and networks. Modern information technologies are used to fulfill this goal. In this process, the target demand is determined based on the marketing rules. The determined volume of demand is implemented with the help of innovations, automated systems, and active employees, and optimal results are obtained [4].

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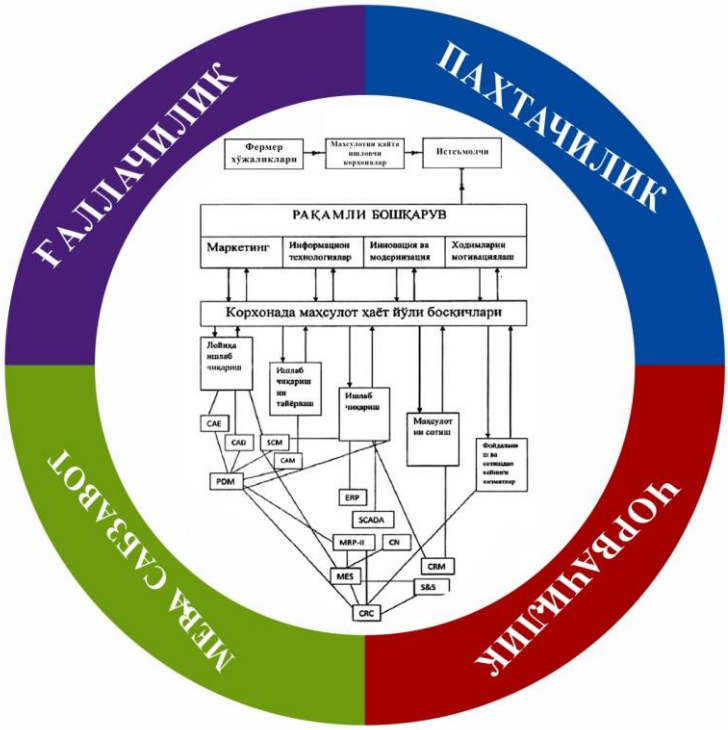

Figure 1. Organization of digital control in the cluster system and its automation systems.

As you can see from the first picture, the objects in the cluster system are technologically and logically connected with each other. The main objects in the structure of the cluster system are industrial enterprises processing agricultural products. We have chosen Andijan "Don Makhsulotri" joint stock company, Asaka "Don Makhsulotri" joint stock company and Korgontepa "Don Makhsulotri" joint stock company as objects of scientific research in our scientific research. We analyzed the reports and statistics of these apiaries for 2015-2022. As a result of scientific analysis, we found out that these enterprises are not developing economically. Therefore, we have developed algorithms for economic sustainable development of enterprises. This algorithm consists of the following formulas:

$M_f = M_q - Ўзх;$ *(1)*

Here is the content of designations in formula 1: M_f - the amount of marginal profit, M_q - the value of the product, Uzx - the amount of variable costs.

$$M_{fn} = \frac{Dx}{Mf}; \qquad (2)$$

Here is the content of designations in the 2nd formula: M_fn is the point of utility of the product, D_x is the fixed costs of the enterprise.

$$M_{brf} = \frac{D_x + F_{br}}{M_f} \qquad (3)$$

The content of the designations in formula 3 is here: M_brf - the total amount of production in the business plan, F_br - the profit provided for in the business plan.

$$I_{mn} = \frac{F_{br}}{M_f}; \qquad (4)$$

Here is the meaning of the designations in formula 4: I_mn is the amount of the economic stability indicator of the enterprise.

$$I_{md} = \frac{I_{mn}}{M_f} * 100\% \qquad (5)$$

Here is the content of the designations in formula 5: I_md - the level of economic sustainability of the enterprise.

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$K_{kj}=\sum_{i=1}^{n} A_{ij}\, K_{si}$ (6)

Here is the content of designations in formula 6: K_kj j - complex indicator representing the economic stability of the enterprise. A_ij is the amount of the i indicator in the j enterprise, K_si is the s weighting factor of the i indicator.Жаҳондаги ривожланган мамлакатлар тажрибасидан маълумки кластер тизими жорий этилган соҳаларда юқори натижаларга эришилмоқда.

The founder of the theory of the cluster system is the American scientist Michael Porter [3].

The role of regions in the stable and continuous development of new Uzbekistan is incomparable. Therefore, we chose Andijan region, one of the main regions of the new Uzbekistan, as a research object. Andijan region is one percent of the territory of the new Republic of Uzbekistan, and its population is ten percent. In Andijan region, there are a number of problems in the current complex conditions (providing food security to the population in a scientifically based situation, creating the necessary number of jobs for people, etc.). One of the main ways to solve these problems is to organize an agro-industry cluster and manage it optimally. Therefore, the issue we are studying is relevant today.

- What is the agro-industrial complex? The agro-industrial complex is a system consisting of four areas that are dialectically and logically connected to each other. The first sector of the agro-industrial complex (ASM) is the industrial enterprises that produce capital equipment - cars, tractors, machine tools and other items. The second sector - the central and main link - is agriculture, which consists of farms. The third sector is industrial enterprises processing agricultural products. The fourth sector is infrastructure, that is, it consists of enterprises and organizations that provide services to ASM. Infrastructure objects are divided into three groups:
- - Market infrastructure;
- - Production infrastructure;
- - Social infrastructure.
- - Taking into account the above, it is necessary to create a system of mathematical models to realize the set goal. They consist of the following: Model of the first field of ASM. This is a mathematical model of the development of industrial enterprises producing cars, tractors, machine tools and other basic tools for ASM; Model of the second field of ASM. This is a mathematical model of optimal placement of farms and their development;
- - ASM third sector model. This model is a mathematical model of the development of industrial enterprises processing agricultural products;
- - Models of the fourth area of ASM, i.e. infrastructure. These are mathematical models of the development of enterprises and organizations serving the market, production and social spheres.Юқоридаги тўртта масалалар бир – бирига боғлиқ бўлиб, асосини рақамли бошқариш ташкил этади.

The organization of digital management requires the rational use of tools and resources that make up information systems.

It is known from the experiences of developed foreign countries and the researches of scientists (academicians Vasil Qabulov, Murad Sharifhujaev, Nodirbek Yusufbekov, S.S.Gulomov, F.B. Abutaliev, etc.) will be Therefore, we dedicated this article to the question of improving the efficiency of the agro-industry cluster based on the digital management of enterprises and aimed to research it.

The dictionary meaning of a cluster is a combination of several identical elements that can be considered as an independent unit with certain characteristics. Therefore, the set of interrelated fields above constitutes an agro-industry cluster. Scientists and experts do not have a single opinion about the agro-industry cluster. Therefore, as a result of our research, we found it necessary to rate the agro-industry cluster as follows. Agro-industrial cluster is a dialectically and technologically interdependent agricultural system, which processes agricultural products and delivers finished products to its consumers.Хозирги даврда замонавий кластер усулларидан фойдаланиб, агросаноат корхоналарида самарадорликни ошириш муҳим масалалардан ҳисобланади.

In studying this important issue, we selected Andijan "Cereal Products", Asaka "Cereal Products" and Kurgantepa "Cereal Products" joint stock companies, which are the central link of the grain production cluster.

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When we processed the data of these enterprises for 2015-2022 using formulas [1-6], we obtained the following results.

$K_{k1} = 0{,}27;$ $K_{k2} = 0{,}31;$ $K_{k3} = 0{,}43.$

As it can be seen from the obtained results, the comprehensive indicators representing the economic strength of all three enterprises are quite low. The closer these indicators are to one (1.0), the better their economic efficiency.

As a result of our research, we offer the following to improve the efficiency of agro-industrial clusters:

- It is necessary to fully transition to digital management of agro-industry clusters using information technologies and systems at all stages;
- Provision of software, network servers, modern techniques and other support tools that ensure the effectiveness of digital management;
- It is necessary to train employees of agro-industry clusters in digital management and improve their skills continuously.

Implementation of the above suggestions will ensure effective management and sustainable development of agro-industrial clusters. This is the basis for the further improvement of the standard of living of our population.

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