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CONTENTS

APPLIED LINGUISTICS

ICT IN HIGHER EDUCATION

INTERNATIONAL WORKSHOP ON PROJECT MANAGEMENT

Coordination of dairy workshops projects on the community territory and their project environment

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Abstract – **The peculiarities of dairy workshops' creation on the territory of communities are considered. The causal relationships are provided, which should be taken into account in the methods and models of coordination the configurations of projects of dairy workshops in the community with their project environment. The method of coordination the configurations of projects for the creation of dairy workshops in the community and their design environment has been developed. This method is based on simulation modeling of project products and involves the implementation of four interrelated steps, which provide: 1) the identification of the objects of the configuration; 2) prediction of the characteristics of the project environment; 3) the definition of organizational and technological and cost indicators; 4) determining the rational parameters of the configuration's. It was offered to determine organizational and technological indicators, which underlie the determination of project value, for predicted configuration of the project environment and the configuration objects (dairy workshops). Organizational and technological indicators are determined by modeling a product for a given project environment. The cost indicators of dairy workshops are determined based on the received quantitative values of the organizational and technological indicators. Rational parameters of project configuration objects are determined on the basis of comparison of the unit value of the functioning of their product in their various variants (branded composition). Changing tendency of organizational, technological and value indicators were determined on the basis of proposed method and simulation of product functioning on the territory of given community (Zabolotiv community, Brody district, Lviv region). They made it possible to establish that the configuration of the projects is rational if modular dairy workshops "KOLAKS-5003" with the efficiency of 5t per 24 hours involving 3 performers are installed. For such productivity of modular dairy workshops, the maximum value of the unit value (7,15 UAH / L) is reached from the project implementation.**

Keywords – project; planning; configuration; dairy workshop; value.

I. INTRODUCTION

Providing the world's population of high-quality food products remains an urgent and unresolved issue for humanity. Proper place in the diet should be given to dairy products. The quality of their production is regulated by a number of standards of Ukraine and the EU. At the same time, territorial reforms and reforms in the agrarian sector took place on the territory of Ukraine. They led to a change in the structure of milk and dairy products. In a mean time, there is a number of problems regard to the quality and efficient production of dairy products. One of them is the creation of efficient dairy workshops due to the implementation of relevant projects in the territory of the newly formed united territorial communities (UTC).

During the creation of dairy workshops in the territory of the UTC, the task of coordination the dairy workshops configurations on the territory of the UTC with their project environment should be worked out. In particular, the value and budget of the dairy workshops projects (DWP) in a given project environment (the territory of particular UTC) are determined both by the parameters of the objects of the configuration of the DWP and the changing characteristics of their project environment. The coordination of the DWP configurations in the UTC with their project environment should be based on tools that, unfortunately, have not yet been developed.

II. ANALYSIS OF LITERARY DATA AND PROBLEM STATEMENT

Regarding the management of the configuration of projects in various applications, a number of standards [1-3] and scientific papers [4-15] are known. These studies relate to projects for the creation of agrarian production systems [13-15], fire extinguishing [8, 12], milk harvesting [7, 11, 14], energy supply for enterprises [9], and state projects [4, 10]. In these works, unfortunately, there is no differentiated approach to coordination project configurations with their project environment.

The emergence of standard [1], became the basis for in-depth study of the process of project's configuration management. The research carried out on this subject revealed a number of inappropriateness in this direction of knowledge [11, 13]. However, these publications, as well as in the standard [1], did not disclose the process of coordination the configurations of the DWP in the territory of the UTC with their design environment, which has its own specifics and features. For its disclosure we will use both standardized knowledge of project management [4, 7], and the results of special studies [5-10].

Analysis of a number of papers suggests that existing methods of project configuration management can not be used to coordinate the DWP configurations in the UTC with their

project environment due to a number of shortcomings. In particular, they do not take into account the peculiarities of the changing environment of the DWP. In addition, they do not provide for identifying the configuration of DWP based on modeling their products, which makes it impossible to obtain the maximum system value for stakeholders. To objectively coordinate the configurations of the DWP in the territory of the UTC with their environment, it is necessary to develop a toolkit that should take into account the variability specific to each UTC, their environment and the peculiarities of their products functioning, which will provide maximum value for the stakeholders.

Goals and tasks of the research

The purpose of the work is to develop a method for the coordination of DWP configurations in the territory of UTC and their project's environment. To achieve this goal, the following tasks should be solved:

– - to propose a method of coordinating the configurations of the DWP in the territory of the UTC and their project environment;

– to determine the tendencies of changes in the values of DWP from the parameters of their configuration objects for a given project environment.

III. THE METHOD OF COORDINATION THE CONFIGURATIONS OF PROJECTS FOR THE ESTABLISHMENT OF DAIRY WORKSHOPS IN THE COMMUNITY AND THEIR PROJECT ENVIRONMENT

The objects of the DWP configuration are characterized by the number and size of dairy workshops, the number of performers involved in the processing of milk harvested in the county. The parameters of the specified configuration objects affect both the regimes of milk processing organization and the indicators of the value of the projects of their operation. The presence on the market of different brands of configurations (dairy shops) of the DWP enables to form various variants of their configuration and to determine between them the rational, which for the given project environment ensures obtaining the maximum system value. Consequently, there is a need to coordinate the configurations of the DWP in the territory of the UTC with their project environment. To reach this coordination it is necessary to model the logistics projects of milk delivery from the procurement points to the dairy workshops, as well as the processing projects, which enables a complete synthesis of all the components of the DWP value.

The presence of a variable amount (Q_n) of milk processing during the life cycle of the product of the DWP requires the coordination of the configuration of the relevant projects with the configuration of their project environment. The next feature that needs to be taken into account when identifying the DWP configuration is the choice of the best organizational mode for using their configuration objects based on the criterion of minimizing the total cost of resources for the functioning of their product.

On the basis of the above-mentioned features of the coordination of the DWP configurations in the territory of the UTC with their project environment, it can be said that their value is determined by the following components:

$$V_n = f(N_m, Q_n, u_b, N_t, \xi_n, \lambda_n, O, \vartheta, P_n), \quad (1)$$

where V_n – value of DWP; N_m – number of dairy workshops in the community territory; Q_n – productivity of dairy workshops; u_b – number of performers; N_t – number and branding composition of transport for milk delivery from provision point to workshops; ξ_n – territorial arrangement of provision points in the community territory regarding location of dairy workshops; λ_n – intensity of milk incomings for processing; O – organizational regime of configuration objects functioning; ϑ – type of dairy products, that are made in dairy workshops; P_n – valid regulations regarding milk provision and dairy products production.

Consider the proposed method of coordination DWP configurations in the territory of UTC with their project environment, which is based on simulation modeling of products of the relevant projects and involves the following steps: 1) identification of the objects of the configuration of the DWP; 2) prediction of the characteristics of the project environment; 3) for the given characteristics of the project environment and objects of the configuration (dairy workshops), their organizational, technological and cost indicators; 4) determination of the rational parameters of the objects of the DWP configuration on the basis of comparison of the value V_n of the products functioning in their various variants (brand composition).

The justification of the parameters of the objects of the DWP configuration is carried out on the basis of the scientific methodological principles and method, which are given in the paper [7]. Prediction of the project environment configures the establishment of trends in the availability and territorial location of milk procurement points and the amount of its harvesting in each of them during the life cycle of the product of the DWP. On the basis of these data, forecasts are made of milk processing amounts during the calendar year according to the method presented in [7].

For the predicted configuration of the project environment and configuration objects (dairy workshops) DWP determine their organizational and technological indicators, which include: the total annual amount (Q_n) of processed milk; total annual complexity (Θ_n) of milk processing; total annual amount (P_e) of electricity consumed; the total annual amount of water (q_b) consumed.

Total annual amount (Q_n) of processed milk is determined by:

$$Q_n = \sum_{j=1}^{t_n} Q_{nj}, \quad (2)$$

where Q_{nj} – the amount of processed milk in j – particular time in life cycle of DWP's product; days t_n – amount of time of life cycle of DWP's product, throughout which the processing of milk is done in dairy workshop.

Total annual complexity (Θ_n) of milk processing in dairy workshop is determined by:

$$\Theta_n = \sum_{j=1}^{t_n} N_u \cdot t_j \,, \qquad (3)$$

where N_u – amount of performers in dairy workshop, persons; t_j – duration of work of dairy workshop in j – particular time in life cycle of DWP's product, hours.

Total annual amount (P_e) of electricity consumed by dairy workshop is determined by;

$$P_e = \sum_{j=1}^{t_n} P_c \cdot k_{\text{ej}} \cdot t_j \,, \qquad (4)$$

where P_c – total fixed capacity of electricity in dairy workshop, kW; k_{ej} – coefficient of electricity usage by consumers in dairy workshop during j-this particular time of milk provision season.

Total annual amount of consumed water $(q_в)$ by dairy workshop is determined by:

$$q_в = \sum_{j=1}^{t_n} q_{\text{вj}} \cdot t_j \,, \qquad (5)$$

where $q_{\text{вj}}$ – the amount of consumed water by dairy workshop during j–time of milk provision season, m^3.

Based on the received quantitative values of organizational and technological indicators of the objects of the DWP configuration (dairy workshops), their cost indicators are determined: specific capital $(B_{кг})$, current $(B_{пг})$ and consolidated $(B_г)$ expenses of the funds for the processing of the total annual milk amount (Q_n).

The rational parameters of the DWP configuration objects are determined on the basis of comparison of the specific value (V_n) from the functioning of their product according to their various variants (brand composition) (Fig. 1).

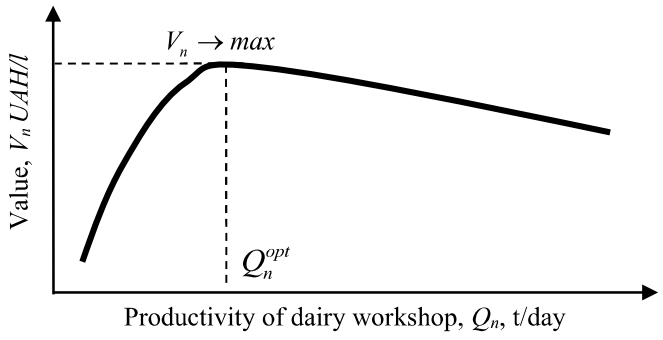

Fig. 1. Tendencies of value changing of DWP regarding productivity of dairy workshop

Specific value (V_n) of dairy workshop creation in the UTC territory is determined by:

$$V_n = C_м - (B + B_л + C_c) \,, \qquad (6)$$

where $C_м$ – average specific value of produced dairy products from 1 l of milk-raw material, UAH/l; B – consolidated specific expenses on processing of 1 l of milk-raw material, UAH/l; $B_л$ – specific logistic expenses, UAH./l; C_c – specific cost of 1 l of procured milk-raw material, UAH/l.

Configuration of DWP is considered as optimal, if V_n reaches its maximal value:

$$\Phi[Q_{nr}] = V_n \to max \,. \qquad (7)$$

Without disclosing the methodical bases for calculating the component costs of funds belonging to specific capitals $(B_{кг})$, current $(B_{пг})$ and consolidated $(B_г)$ expenses of processing the total annual milk amount (Q_n), we will concentrate on the parameters of the DWP configuration objects to be optimized. The number of options for these configuration objects can be finite plural, which is limited by the presence on the market of workshops variety for the processing of milk of various productivity.

IV. Results of Tendencies Determination of Change of Value Indicators of Dairy Workshops Creation from Parameters of Their Configuration Objects for a Given Project Environment

To determine the trends of changes in the values of projects for the creation of dairy workshops on the parameters of their configuration objects, a study was carried out for conditions of Zabolotiv community UTC in the Brody district of the Lviv region. Modular dairy mini-workshops of various productivity of the firm "KOLAKS" were adopted by the objects of the DWP configuration.

Based on the corresponding calculations, a diagram of the structure (S_n) of the dairy products' value, obtained by the dairy workshop with different productivity (Q_n) was constructed (Fig. 2).

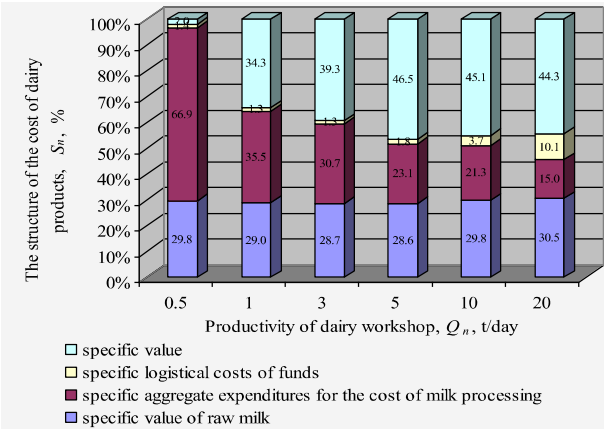

Fig. 2. The structure (S_n) of dairy products value, that was obtained by dairy workshop of different productivity (Q_n)

From the diagram it can be seen that the cost of milk-raw material varies slightly (within the range of 28.6 ... 30.5%) in

the structure of the cost of dairy products. At the same time, the specific total costs of milk processing are decreasing, while specific logistic costs and specific income increase with increasing productivity (Q_n) of the dairy workshop. This is explained by the fact that with the increase in the productivity (Q_n) of the dairy workshop, the specific current and capital costs of the product for the functioning of the DWP are reduced and transport costs for the delivery of raw milk to the dairy workshop are increasing.

Taking into account that the consolidated specific cost of funds for the operation of the DWP product and the specific costs of logistics projects are variable and depend on the productivity of the dairy workshop (Q_n), the specific value from the establishment of the workshop will also be changeable (Fig. 3).

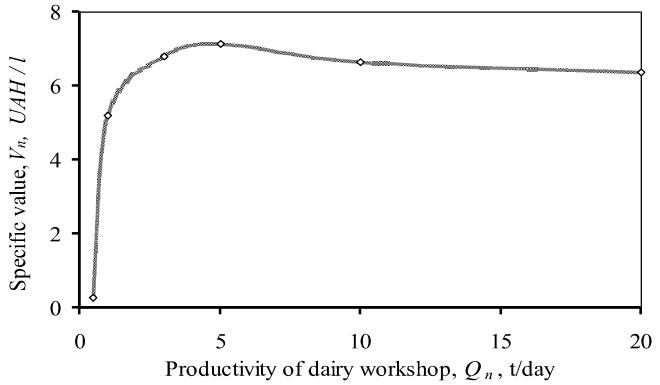

Fig. 3. Dependency of value (V_n) DWP from productivity (Q_n) of dairy workshop

As we see (Fig. 3), the specific value from the establishment of the dairy workshop increases with increasing its productivity to 5 t / day, and then gradually decreases. This is explained by the fact that, due to such productivity of the dairy workshop, there are insignificant logistic costs of the delivery of milk as raw materials to the place of processing, and if the productivity of this workshop is more than 5 tons per day, they reduce this value. Maximum value of specific value (V_{max} = *7,15 UAH / l*) from creation of dairy workshop in the district is observed on its productivity Q_n = 5 t/day.

CONCLUSION

The proposed method of coordination of DWP configurations in the territory of UTC with their project environment predicts taking into account a specific, changing project environment and performing a phased research with the help of statistical simulation of the products of the projects of controlled components influence on the organizational and technological parameters of the configuration objects. The cost estimation of the functioning of the product DWP is the basis for determining their rational (optimal) configuration, which achieves the maximum meaning of system value.

Based on the simulation modeling of the operation of the DWP product at the given configuration of the project environment (conditions of Zabolotiv UTC, Brody district, Lviv region), it is determined that their configuration is rational if the installation of modular dairy mini factories (workshops) "KOLAKS-5003" with a productivity of 5 t / day with the engagement of three performers. For such productivity of modular dairy mini-factories (workshops) the maximum meaning of specific value (V_{max} = *7,15 UAH / l*) is reached with the implementation of the DWP.

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