Planning of Resource Support for the Management System of the Process of Increasing the Level of Competitiveness in the Environment of the Functioning of the Socio-Economic System

Marta Kopytko[1*], Galyna Myskiv[2], Svitlana Lykholat[2], Nataliia Petryshyn[3], Ihor Taranskiy[2], Nila Tiurina[4]

[1] Department of Socio-Behavioral, Humanitarian Sciences and Economic Security Law, Lviv State University of Internal Affairs, Lviv 79000, Ukraine
[2] Department of Marketing and Logistics, Lviv Polytechnic National University, Lviv 79000, Ukraine
[3] Department of Foreign Trade and Customs, Lviv Polytechnic National University, Lviv 79000, Ukraine
[4] Department of Economics, Management and Administration, Khmelnytskyi National University, Khmelnytskyi 39000, Ukraine

Corresponding Author Email: marta.kopytko.edu@gmail.com

ABSTRACT

The main purpose of the article is to determine the best planning option for resource support of the management system for the process of increasing the level of competitiveness in the environment of the functioning of the socio-economic system. The relevance of the research topic is added by the fact that the ecology industry is extremely difficult and constantly needs innovation. The activity of an ecological socio-economic system depends on its competitive advantages, level of competitiveness, and resource support. The basic methods that form our methodology are the method of system analysis and pairwise comparison. Based on the results of the study, a structuring of all possible options for resource support for increasing the level of competitiveness of an ecological socio-economic system was formed on the example of Ukrainian ecological enterprises PJSC "Odessa Ecological Enterprise". So, for the ecological socio-economic system selected as an example, a choice of the most rational of the possible options was presented, resources for planning the management system in the process of increasing its competitiveness. The study has a number of limitations and they are related to the impossibility of applying the proposed approach to a larger number of ecological socio-economic systems. Further research should be aimed at expanding the practical aspect and covering more and more socio-economic systems of this sector.

1. INTRODUCTION

Today, the paradox is that the leaders of many socio-economic systems do not consider resource support as the main element of their competitiveness. This situation indicates a low level of consciousness not only of business, but also of consumers. It is important to understand that minimizing or neutralizing the negative impact of production activities on the environment is possible only with proper resource support.

At the present stage, the presence of competitive advantages in the ecological socio-economic system is a prerequisite for its survival in the market. A high level of competitiveness of an socio-economic system should indicate the effectiveness of its management system, flexibility in adapting to changes in the operating environment, high-quality products, and services, adequate pricing policy, positive consumer perception of the brand, the company's trademark, and a high level of personnel qualification. This list can be continued indefinitely. This makes the problem of theoretical substantiation of the competitive strategy, improvement of methodological recommendations for assessing the level of competitiveness of the ecological socio-economic system, and its resource provision extremely relevant. The problems of this topic are inherent in complex, combined nature, since the study of the

theoretical aspects of the problem of developing and implementing programs to increase competitiveness, as well as issues related to the management of these processes, should be carried out based on the available resources and options that can be used to increase the level of competitiveness.

Competitiveness management at the level of socio-economic system is a set of measures for the systematic improvement of the product, the search for new channels for its sale, and the improvement of after-sales service. Competitiveness management of the socio-economic system is identified with a system of knowledge about the principles, methods, and technology of forming competitive advantages and ensuring the viability of an ecological enterprise as a subject of economic activity on their basis.

The environment in which socio-economic systems operate today is characterized by a significant increase in the dynamism of all economic processes, especially with regard to competition. That is why the problem of managing the competitiveness of enterprises is becoming relevant. A significant number of works devoted to the problems of competitiveness and its management testify, first of all, to the objective difficulty of recognizing the main categories of this process.

Along with this, the question arises: How to increase

competitiveness with the available resources? What should be the resource support in this case? When there are options and alternatives, the question arises of which one to choose the best in a given situation.

The main purpose of the article is to determine the best planning option for resource support of the management system for the process of increasing the level of competitiveness in the environment of the functioning of the socio-economic system.

The innovative nature of our study lies in the fact that today the rational use of resources is especially relevant for each enterprise. This is due to the fact that in today's competitive environment, only a skillful and rational enterprise using its resource capabilities can effectively function and develop. Despite significant relevance, to date, most advice on the efficient use of resources is vague and segmental, given that our study will allow us to see and solve this problem comprehensively and fully.

The structure of the article includes an analysis of scientific and literature on the research topic; a detailed description of the main methods of analysis that form the methodology; the main results of the analysis; part of the discussion of the main results of the study and its comparison with previous works; formed for the results of the study, conclusions and further opinions of the authors about future work.

2. LITERATURE REVIEW

When reviewing the literature, it should be noted that the topic is not very relevant today in the scientific and practical field of activity. This is because, in the conditions of fierce competition, there is a growing need to develop long-term strategies for the development of socio-economic systems that would define clear guidelines for the future and help direct the efforts of business entities to search for long-term competitive advantages in the operating environment.

Most scientists [1-3] believe that ensuring sustainable competitive positions of socio-economic systems involves the development of ways to improve production efficiency in the presence of developed strategies for functioning in a competitive environment. In their opinion, the competitiveness of the socio-economic systems is the to produce and sell competitive products that will have competitive advantages compared to similar products of competitors in a certain period of time in a certain market, as well as to form the dynamics of the effectiveness of positive changes in the main indicators of profitability and increase in cost companies capital.

Some groups of scientists [4-6] consider the increase in competitiveness as a long-term process carried out in accordance with the chosen strategy for the development of an socio-economic systems; a number of measures can be identified that provide socio-economic systems with the achievement of competitive advantages, namely: reducing the cost of production; increasing its priority; change in the quality and technical parameters of products; identifying flaws in competitor products; introduction of innovations; identifying the advantages of own products in comparison with substitutes; use of price factors to increase competition; influence on the consumer through advertising, providing a loan; search for new areas of product use.

We do not agree with this opinion, and we believe that the competitiveness of a socio-economic systems should be considered as a state in which the quality of competitive advantages in the market makes it possible to demonstrate a high, medium, or low level of competition. It should also be noted that the state of security has a significant impact on the level of competitiveness of the socio-economic systems, and without effective security mechanisms, high performance will be difficult to achieve.

A separate issue is the resource support and the system of their management in the context of increasing the level of competitiveness of the socio-economic systems.

An interesting study is the work of Navickas and Malakauskaitė [7], where scientists considered the very issue of assessing competitiveness and market position. They also noted that without resource support, it is impossible to talk about increasing the level of competitiveness of a socio-economic system.

Urba et al. [8] analyzed the human resources management of a socio-economic system. In their opinion, these are one of the most important resources for the activities of any socio-economic system. We agree with this vision and also believe that it is impossible to talk about a high level of competitiveness of a socio-economic system without an effective labor resources management system. For environmental protection, not only financial resources are important. Planning should be carried out by attracting labor resources.

As Adbulaziz [9] aptly points out, the structure of resource support is individual for each socio-economic system and is determined in accordance with the goals and objectives of the enterprise. The structure of resource support is influenced by many factors, including the field of activity in which the enterprise operates its organizational and legal form, the chosen development strategy, the scale of production, the number of employees, financial and economic conditions, and more. That is why we should choose one specific socio-economic system for a demonstration example for our already research.

As most leading scientists and practitioners note [10-13], only with the integrated use of available resources and management of the resource support system will an enterprise be able to achieve the set results and increase the level of competitiveness. Today, unfortunately, there is no single approach to creating a resource provision model that can take into account all its features and all resource options as such. Therefore, the study of this issue has not only theoretical but also practical significance.

Analyzing the modern literature [1-3], we can conclude that the goal of the research presented by us is quite relevant. That is why we strive to determine the best option for planning of resource support of the management system for the process of increasing the level of competitiveness for socio-economic systems.

3. METHODOLOGY

In general, we are of the opinion that one should not single out only one type of resource support, on which the entire state of competitiveness of the socio-economic system can be put. This should be a group of resources that will form the resource support system to increase the level of competitiveness of the socio-economic system.

The conditions of martial law, in which all Ukrainian ecological enterprises (one of socio-economic system forms)

found themselves, changed their functioning. Under military actions, the amount of resources is limited. It is extremely important to structure them and choose the optimal ones, with the aim of their further use to increase the level of competitiveness of the socio-economic system. So, in the conditions of martial law in Ukraine, we will single out the following groups of resources that are extremely important for enterprises and will form the so-called resource support system. All allocated resources were formed on the basis of an analysis of the opinions of experts using the expert method of interviewing employees of a selected enterprise.

The first group of resources is, of course, labor. The labor resources of an enterprise are a key element of the entire socio-economic system, which, with effective aggregate work, can create the same competitive advantages. These are the following under military actions:

1) specialists of outside organizations;

2) employees who form the intellectual capital of the socio-economic system;

3) specialists in the field of environmental protection.

The second group of resources, which is extremely important in the conditions of military actions for the enterprises of Ukraine, are organizational resources. That is the resources that are intended organizational and technical to influence the level of competitiveness of the socio-economic system. These are the resources provided by the enterprise management system, the culture system, and the structure of the socio-economic system itself. These are the following under military actions:

1) internal management decisions of the socio-economic system;

2) obtaining and applying the experience of other socio-economic systems;

3) activities of the organizational culture.

The third group of resources under martial law is usually financial. They are most vulnerable in an environment where active hostilities take place. Here, in conditions of war, socio-economic systems like enterprises do not have much to choose from. Therefore, almost all engineering enterprises in Ukraine should only three main areas to increase competitiveness:

1) through their own, formed separately for this, means to increase the level of competitiveness;

2) through raising funds from other funds, accounts, and reserves of the enterprise;

3) through obtaining favorable credit conditions or financial assistance as a result of military actions.

The planning of resource support system should be such that it will allow the use of several options with a combination in accordance with the needs in order to increase the level of competitiveness of the socio-economic system.

Therefore, in our opinion, it is these resources that will help increase the level of competitiveness of the socio-economic system.

Let's take the activity of socio-economic system PJSC "Odessa Ecological Enterprise" as an example. All options for each group of resources are within the capabilities of the management of PJSC " Odessa Ecological Enterprise ". The key methods that form our methodology are the method of system analysis and pairwise comparison.

If we consider system analysis, then this method is based on a number of applied logical-mathematical disciplines, technical procedures and methods widely used in the management of activities, including formalized and informal research tools, as well as general principles.

While the method of pairwise comparison is one of the tools for evaluating and choosing decisions, which is widely used when it is necessary to prioritize in the process of any activity or to rank various objects and the primacy of one of them is determined.

For a methodical approach through systems analysis, the scale for assessing the resource support should occur in three levels:

1. Low level of resource support. This level does not allow for the process of increasing the level of competitiveness of the socio-economic system. It stops.

2. The average level of resource support and the process of increasing the level of competitiveness of enterprise. The level at which there is a chance to succeed and realize the goals set for the competitiveness of the socio-economic system.

3. High level of resource support. This is not just a level more likely to achieve success and realize the goals set for the competitiveness of an enterprise. At this level, we can talk about the acceleration of this process as a whole.

Each level of resource support of the management system in the process of increasing the level of competitiveness under martial law should be mathematically indicated through the use of the concept identification method (Table 1).

Table 1. Mathematical identification of levels of resource support

Level	Labor resources	Organizational resources	Financial resources
Low level of resource support	a_1	b_1	c_1
The average level of resource support	a_2	b_2	c_2
High level of resource support	a_3	b_3	c_3

But not only was the method of system analysis used. Also, the method of paired comparisons on the advantage of options took an active part in the calculations. This method is effective for identifying opportunities for optimal provision of resources for a particular process. In our case, increasing the level of competitiveness of the socio-economic system. The method provides for the assessment of alternative possibilities to planning of resource support for the management system in the process of increasing the level of competitiveness.

4. RESULTS OF RESEARCH

The first result should be considered a generalization of the opinions of the employees of the PJSC " Odessa Ecological Enterprise ". Generalization of opinions regarding the relative importance of resource support for the process of the management system for the process of increasing the level of competitiveness (Table 2).

It should be noted that these two levels of resource support of the management system for the process of increasing the level of competitiveness, which are compared with each other, depending on what effect they have on this process, form an assessment of importance, which will include the corresponding element of the matrix itself. Due to the choice of the system analysis method, the entire diagonal of the

matrix will be 1, and the lower part will include the inverse values.

Table 2. Levels of relative importance of resourcing

Characteristic	Set number of points
A particular level completely overrides another	5
A particular level significantly exceeds another	4
A particular level overrides another	3
A particular level partially overrides another	2
A particular level is equal to another	1

So, let us present the basic calculations of comparing the levels of resource support of the management system for the process of increasing the level of competitiveness for the PJSC "Odessa Ecological Enterprise".

Table 3 presents the results of calculating the priority vector of the established matrix, which we denote mathematically as M_n. It was also the values of the matrix priority vector (λ_{max}), the consistency ratio (WY), and the consistency index itself (IY) that were calculated.

Table 3. The main results of the calculation of the comparison of certain levels of resource support and the matrix

Labor support of the management system for the process of increasing the level of competitiveness			
a_{ij}	a_1	a_2	a_3
a_1	1	2	3
a_2	1/2	1	1
a_3	1/3	1	1
M_n	0.69	0.2	0.11
λ_{max}		**IY**	**WY**
3.01		0.01	0.01
Organizational support of the management system for the process of increasing the level of competitiveness			
b_{ij}	b_1	b_2	b_3
b_1	1	3	4
b_2	1/3	1	2
b_3	1/4	1/2	1
M_n	0.62	0.23	0.13
λ_{max}		**IY**	**WY**
3.01		0.01	0.01
Financial support of the management system for the process of increasing the level of competitiveness			
c_{ij}	c_1	c_2	c_3
c_1	1	4	5
c_2	1/4	1	2
c_3	1/5	1/2	1
M_n	0.68	0.2	0.11
λ_{max}		**IY**	**WY**
3.02		0.01	0.02

It should be noted that a positive result in our case is the situation when the level of convergence of the comparison process and the consistency of the opinions of the specialists of PJSC " Odessa Ecological Enterprise " is satisfactory. This is only if the requirement WY≤0.1 are met. This is done for labor support.

In terms of organizational support of the management system for the process of increasing the level of competitiveness for socio-economic system based on the results of calculations, we can talk about satisfactory numbers.

For financial support, the calculations of paired comparisons are positive, since the consistency ratio is less

than 0.1. This indicates the optimal level of convergence of comparison and consistency of opinion of the specialists of PJSC "Odessa Ecological Enterprise" regarding the significance of indicators of the level of financial support of the management system for the process of increasing the level of competitiveness.

Table 4. The main results of the calculation of the comparison of labor resources by levels of support

Comparison of labor resources by a low level of support			
a_{ij}	a_1	a_2	a_3
a_1	1	1/2	1/4
a_2	2	1	1/3
a_3	4	3	1
M_n	0.13	0.23	0.62
λ_{max}		**IY**	**WY**
3.01		0.1	0.01
Comparison of labor resources by an average level of support			
a_{ij}	a_1	a_2	a_3
a_1	1	1/2	1/3
a_2	2	1	1/3
a_3	3	3	1
M_n	0.15	0.24	0.6
λ_{max}		**IY**	**WY**
3.05		0.02	0.04
Comparison of labor resources by a high level of support			
a_{ij}	a_1	a_2	a_3
a_1	1	1/2	1/3
a_2	2	1	1/2
a_3	3	2	1
M_n	0.16	0.3	0.53
λ_{max}		**IY**	**WY**
3.01		0.05	0.08

Table 5. The main results of the calculation of the comparison of organizational resources by levels of support

Comparison of organizational resources by a low level of support			
b_{ij}	b_1	b_2	b_3
b_1	1	3	5
b_2	1/3	1	3
b_3	1/5	1/3	1
M_n	0.62	0.23	0.13
λ_{max}		**IY**	**WY**
3.03		0.01	0.03
Comparison of organizational resources by an average level of support			
b_{ij}	b_1	b_2	b_3
b_1	1	3	4
b_2	1/3	1	2
b_3	1/4	1/2	1
M_n	0.62	0.23	0.13
λ_{max}		**IY**	**WY**
3.01		0.01	0.01
Comparison of organizational resources by a high level of support			
b_{ij}	b_1	b_2	b_3
b_1	1	2	3
b_2	1/2	1	1
b_3	1/3	1	1
M_n	0.54	0.24	0.21
λ_{max}		**IY**	**WY**
3.01		0.01	0.01

Let's compare the labor support of the management system

for the process of increasing the level of competitiveness, taking into account the corresponding levels of resource support (Table 4). In general, the results of the comparison showed that the level of agreement is acceptable (WY≤0.1).

Let's compare the organizational support of the management system for the process of increasing the level of competitiveness, taking into account the corresponding levels of resource support (Table 5). In general, the results of the comparison showed that the level of agreement is acceptable (WY≤0.1).

Let's compare the financial support of the management system for the process of increasing the level of competitiveness, taking into account the corresponding levels of resource support (Table 6). In general, the results of the comparison showed that the level of agreement is acceptable (WY≤0.1).

Table 6. The main results of the calculation of the comparison of financial resources by levels of support

Comparison of financial resources by a low level of support			
c_{ij}	c_1	c_2	c_3
c_1	1	1/2	1/4
c_2	2	1	1/3
c_3	4	3	1
M_n	0.13	0.23	0.62
λ_{max}		**IY**	**WY**
3.01		0.01	0.01
Comparison of financial resources by an average level of support			
c_{ij}	c_1	c_2	c_3
c_1	1	1/2	1/3
c_2	2	1	1/2
c_3	3	2	1
M_n	0.16	0.29	0.53
λ_{max}		**IY**	**WY**
3.01		0.005	0.008
Comparison of financial resources by a high level of support			
c_{ij}	c_1	c_2	c_3
c_1	1	1/2	1/2
c_2	2	1	1/2
c_3	2	2	1
M_n	0.19	0.31	0.5
λ_{max}		**IY**	**WY**
3.05		0.02	0.04

Table 7. Utility indicators of the main types of resource support

Labor support			
Y_{Rij}	Y_{Ri1}	Y_{Ri2}	Y_{Ri3}
Y_{R1j}	0.13	0.23	0.62
Y_{R2j}	0.15	0.24	0.59
Y_{R3j}	0.16	0.29	0.53
Organizational support			
Y_{Rij}	Y_{Ri1}	Y_{Ri2}	Y_{Ri3}
Y_{R1j}	0.62	0.23	0.13
Y_{R2j}	0.62	0.23	0.13
Y_{R3j}	0.54	0.24	0.21
Financial support			
Y_{Rij}	Y_{Ri1}	Y_{Ri2}	Y_{Ri3}
Y_{R1j}	0.62	0.23	0.13
Y_{R2j}	0.62	0.23	0.13
Y_{R3j}	0.54	0.24	0.21

Thus, we have every opportunity to calculate the utility function for each type of resource support (Y_{Rij}) of the management system for the process of increasing the level of competitiveness of the socio-economic system at different levels (Table 7).

In order to simplify the presentation of calculations, we will form a summary matrix. The elements of the vector of priorities make it possible to establish a certain weight of the types of certain resources according to the levels of their support of the management system for the process of increasing the level of competitiveness (D_i). The value of the usefulness of certain resources (Y_{Ri}) in our situation for our socio-economic system under military actions has three options (1):

$$Y_{R1}=D_{R1}Y_{Ri1}+ D_{R2}Y_{Ri1}+ D_{R3}Y_{Ri1} \qquad (1)$$

The matrix of utility function values and evaluation of options for resource support of the management system for the process of increasing the level of competitiveness of a PJSC " Odessa Ecological Enterprise "is presented in Table 8.

Table 8. The matrix of utility function values and evaluation of options for planning resource support

Labor support	
Y_{R1}	0.14
Y_{R2}	0.24
Y_{R3}	0.61
Organizational support	
Y_{R1}	0.62
Y_{R2}	0.25
Y_{R3}	0.12
Financial support	
Y_{R1}	0.14
Y_{R2}	0.25
Y_{R3}	0.59

If there is a need for labor support of the management system for the process of increasing the level of competitiveness, the best option would be specialists in the field of environmental protection (Y_{R3}). They are the most valuable resource for enhancing the competitiveness of an ecological enterprise. The second alternative, in case of problems with the first option, are employees who form the intellectual capital of the socio-economic system, who would be extremely useful.

In terms of organizational support, the results of the calculation say that basically, it will be the most effective when choosing the option of internal management decisions of the enterprise (Y_{R1}). This is followed by an alternative on the use of organizational support through the acquisition and application of the experience of other socio-economic systems.

With regard to financial support, according to the results of the calculations and taking into account the need for them, the best option would be funding through obtaining favorable credit conditions or financial assistance due to military operations (Y_{R3}). Of course, under military actions, there is strong international support for Ukraine, and such funds can be obtained more easily than in peacetime and faster. However, not all businesses may be lucky. In the event that PJSC " Odessa Ecological Enterprise " chooses such a rational option, and it does not work out due to unpredictable events, you should pay attention to the Y_{R2} alternative - raising funds from other funds, accounts, and reserves of the enterprise.

5. DISCUSSIONS

Discussing the results of the study, it should be noted that our study on the competitiveness is not the only one. The problem of competitiveness in the context of ensuring the security of socio-economic systems has been the attention of many scientists [14, 15]. As the authors note, any engineering enterprise faces various types of risks and threats throughout its life cycle, which significantly affects its level of competitiveness. However, we did not consider the issue of security in our study; the focus was on planning of resource support.

Other scientists [16-18], for example, consider the problem of increasing the level of competitiveness through the formation of a strategy. The formation of a strategy is an important element for increasing its competitiveness and ensuring a high level of security. They offer different options for a strategy to increase the competitiveness of an enterprise.

A group of scientists Hurzhyi et al. [19] through innovative development, the issues of increasing the level of competitiveness are considered. We do not rule out that it is through innovative development that it is possible to better increase the level of competitiveness. Here the situation is that our study gives a different result, presented through the resource support of the management system for the process of increasing the level of competitiveness for socio-economic systems.

Rushchyshyn et al. [20] considered the management system for innovative development of an enterprise in the context of increasing its competitiveness. And discussing our research results, it should be noted that they also analyzed through resource support, and also, they touched on the general issue of increasing the level of security in the first place.

But, it should be generalized that the results of the study have differences by determining the rational-optimal type of resource support for increasing the level of competitiveness of an socio-economic system.

6. CONCLUSIONS

According to the results of the study presented in the article, we can draw certain conclusions. Thus, the results of the calculations carried out will make it possible to determine the rationally optimal type for planning of resource support for the management system of the process of increasing the level of competitiveness. We, as an example, proposed options for a single but operating at the time of writing, ecological enterprise.

The importance of planning of resource support of the management system for the process of increasing the level of competitiveness of the socio-economic system is substantiated. The main possible options for resource support for each of the following groups for the ecological enterprise we have chosen are identified: labor, organizational and financial resources. The main levels of providing resources for the management system of the process of increasing the level of competitiveness of the socio-economic system are determined. A comparison of the levels of resource support and consistency of the matrix determined by us has been calculated. A summary matrix for assessing the options for resource support of the process management system for increasing the level of competitiveness of the socio-economic system has been developed. It has been determined that if there is a need

for labor resources in the management system of the process of increasing the level of competitiveness, the best option will be specialists in the field of environmental protection. For organizational resources, these are internal management decisions. For financial resources, these are funds through obtaining favorable credit conditions or financial assistance as a result of military actions in Ukraine (our socio-economic system from Ukrainian regions and in the middle of military actions).

In the end, we would like to emphasize once again that increasing the level of competitiveness is a process of change, and like any process, especially one that causes certain opposition, needs management and, in particular, resources. Since the changes concern all the main organizational components, including the structure of personnel, employment, qualifications, technology, equipment, products, and sales markets, then, accordingly, the starting point for increasing competitiveness is the development of a strategy for such an increase, taking into account all possible options for planning of resource support.

The study has a number of limitations and they are related to the impossibility of applying the proposed approach to a larger number of enterprises. Further research should be aimed at expanding the practical aspect and covering more and more socio-economic systems of the ecological sector.

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