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CHAPTER I. THEORETICAL PLATFORM OF REGIONS TOURIST AND HOTEL- RESTAURANT CLUSTERS DEVELOPMENT

Introduction.

To ensure the effective development of the tourism sector, each public entity must find an effective model for its regional development. This model must identify the instruments of influence to be defined and used adequately. This process should be based on an analysis of the totality of conclusions about the nature of the relationships and the links between the phenomena that characterize an effective regional development model. Each theory of regional development is the most advanced form of scientific reflection on processes of changes in the quality of territories. Therefore, the synthesized expression of theories forms a theoretical platform. Regional development theories form a theoretical platform. The theoretical platform is a set of features that define the designs of the outlined models [1; 2; 3, p. 17].

It is because the theoretical platform is [4]:

- 1) a system, which determines the combination of theoretical constructs (or elements that form the scientific vision of social, economic, environmental, and other processes);
- 2) a regional setting identifying the features of the possible development of tourism and recreation in each region;
- 3) an objective, constant and necessary relationship between the elements, forming a view of the patterns of the tourism industry functioning.

The concept of the cluster has different interpretations in the scientific literature. Thus, since 1933, regional development theories have been actively considering the features of the formation and use of various network forms of functioning in the tourism industry and models of regulation of such networks in tourist regions with hotel and restaurant complexes. At the same time, the network regulatory principle of regional development provides cluster formation. Clusters are networks. Naturally, the base of application of theories became the regions within their borders. At the



same time, regional clusters are considered a network of objects of the territorial tourist system, connecting tourist areas with hotel and restaurant complexes.

1.1. The essence of the theoretical platform of tourist and hotel-restaurant regions clusters development

Synthesis of the features of the theoretical platform (among which systematization, regional application, objective, constant and necessary relationship between the elements) allows forming of a scheme, which is a simplified image of approaches to the development of tourist and hotel-restaurant clusters (figure 1). The given diagram summarizes such elements:

- the theoretical construct identified as actions or objects that form a view of the cluster;
- the vision identified as a vision of the development of the tourism industry in each region;
- the patterns of the tourism industry functioning (action describes the cluster members' relationship).

The combination of the presented elements forms a scheme of tourist and hotel-restaurant clusters development in time and space (or regional development model), the organizational structure of influence (or influence model). These models are formed and transmitted through the institutional development model (or institutions of government set).

As to the essence of the cluster as a network, there are theories of regional development that have already:

- considered peculiarities of formation;
- use of different network forms of cooperation of business entities and models of influence on their development in tourist regions since 1933.

Regions are the basis of theories and their limits. Within the regions, networks of objects formed the territorial system combining tourist fields and different specific features (geographical, historical, resource) [6].

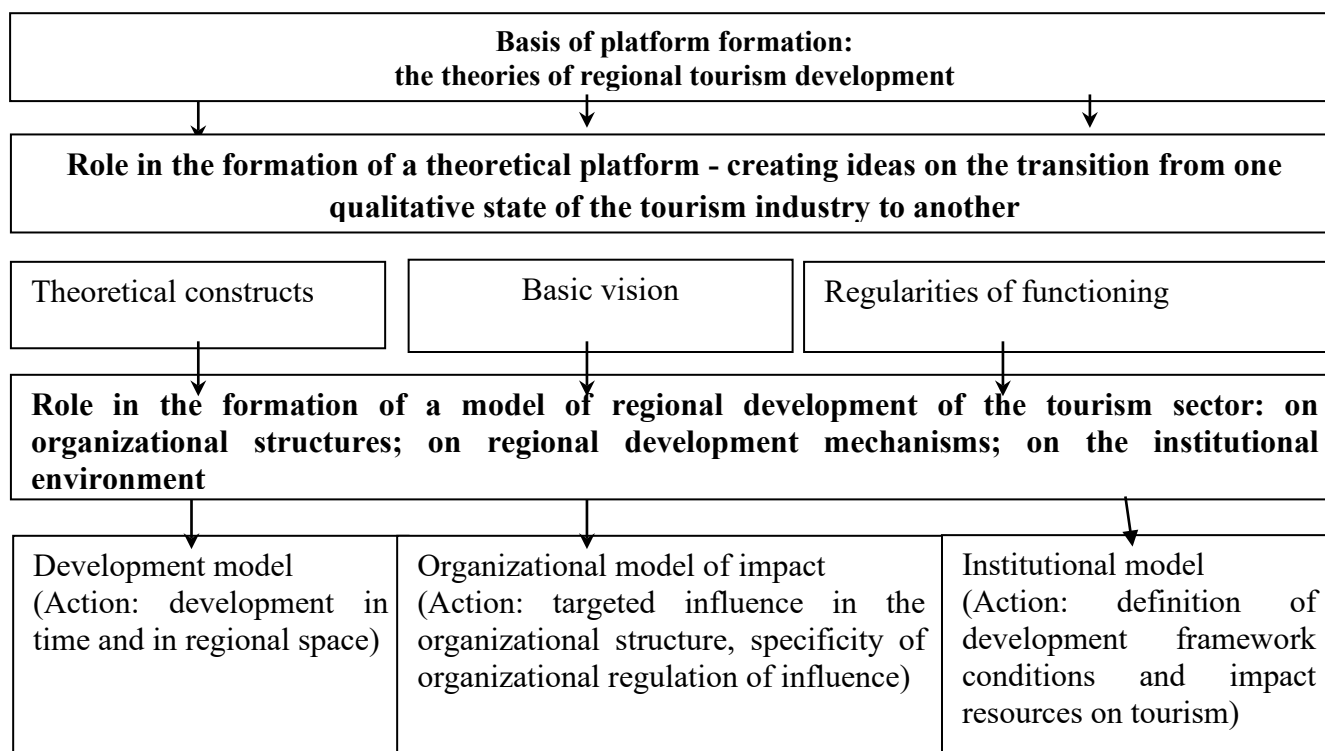


Figure. 1. The theoretical platform for the tourist and hotel-restaurant regions clusters development

* The organizational model of influence is oriented towards the goals and objectives of the associations of economic entities

Source: compiled on the basis of [3; 4; 5]

According to modern research of trends and contradictions of functioning of regions and their networks, several theories based on various ideas of unification of local territories and subjects of economic activity, formation of rules of behavior and policy of development inside the tourist region [3]. In particular, these are:

1) theories oriented to the development of tourism through purposeful influence on the main economic subjects and main geographical objects (growth poles, central places, circle centers, diffusion process centers, etc.);

2) theories aimed at the tourism sector development and purposeful influence on the mutually dependent system of tourist-attractive territories, with the purpose of their consistent integration and economic space.

Various associations of economic entities, among which clusters and the formation is close to them, have a secondary role. Consistent integration of economic space is not a priority in managerial influence formation. This group separates several



economic and geographical theories. In particular:

- The theory of central places (V. Kristaller);
- The theory of "spatial economic equilibrium" (A. Losh);
- The theory of "growth poles" (F. Perra);
- Spatial interpretation of the theory of "growth poles" (J. Budville);
- The theory of "diffusion of innovations" (T. Hegerstrand).

Each of the above theories, which constitute the basis of the formation of the theoretical platform of tourist and hotel-restaurant regions clusters development, is a system of scientific knowledge. This system is oriented toward tourism development through targeted impact on main economic and main geographical reference objects:

- poles (or points) of growth. It is a set of profile industries, the growth center, and geographical interpretation of the profile pole;
- central places. These are economic centers that provide goods and services to themselves and serve the population around the center;
- stake centers. These are market zones, which determine proximity to the market of sales, optimal transport costs, and population placement;
- centers of the diffusion process. These are local territories from which innovations are applied to the region on the wave principle.

The basis of the formation of the theoretical platform is the theories oriented toward the tourism sector's development. These theories aimed at the purposeful influence on the mutually dependent system of tourist-attractive territories and consistent integration of their economic space. In this group are allocated:

- The theory of "cumulative growth" G. Murdal;
- The theory of "center-periphery" J. Fridman;
- The theory of "self-development of regions" P. Romera or "engorged development";
- The theory of "sustainable development" I. Vernadsky;
- The theory of "balance relations systems" Bronshpak G.k., Chernyshova S. I. (2009 p.).

Each of the above theories forms the basis of the formation of the theoretical



platform for the development of tourist and hotel-restaurant regions clusters, is a system of knowledge oriented toward the sphere of tourism development due to the purposeful influence on:

- networks of settlements or networks of central places;
- networks of clusters, ranging from small and medium (in limited geographical zones) to "mega-clusters";
- subdistricts summarize the networks of resorts, natural parks, recreation zones, hotel and recreational complexes, tourism centers, etc.

A group of theories outlined is oriented on the network principle of regulation of regional development of regions (through the formation of clusters, a network of settlements, etc.) and uses the network management principle.

The association of geographically close business structures (branch, territorial, voluntary) has the main role in the intensification and improvement of regional development of the tourism sphere.

1.2. Theories of tourism development through influence on main economic and main geographical reference objects

Consider detailed theories oriented toward the management of tourism development due to the purposeful influence on the economic and geographical reference objects. The specificity of theories is a significant limitation of the role of the cluster and the network entities close to them (among them networks of central places (V. Kristallera), the network of "the nest of beekeeping chairs" central places, etc.). The limited availability is due to the absence of a well-established approach to understanding the tourist and hotel-restaurant cluster in the region.

1. The theory of central places (V. Kristallera, 1933). The theory of regional development, which is characterized by application in the regulation of the tourism sphere is considered to be the theory of central places [9; 10]. The ideas of V. Kristaller continued in his works by such foreign scientists as J. Garner, E. Kant, X.



Kerol, L. Lalanne, P. Merlen, A. Person, P. Haggett, A. Schlier, B. Burri, J. Bras, Wu. Harrison, M. Daisy, J. Zipf, J. Parr, E. Ulman [7]. To the domestic followers. Kristaller can be attributed: A.Golikova, S.Doroguntsova, K. Neets, L. Neets, Ya. Oliynyk, M. Piston [9; 3, pp. 19; 10].

This system of scientific knowledge orient on development in conditions of such economic space, which is characterized by the following regularities of functioning [3; 7; 8]:

1) creation of networks characterized by the occurrence of nuclei, which divide into higher and lower and form nodes within the boundaries of connections of homogeneous objects (network "balanced tree"). Higher hierarchical levels of nuclei (large settlements) are about the descendants (settlements of lower levels - cities, settlements, villages), as they provide basic goods and services. Each settlement, which is to the ancestor, is called the central place (or service center);

2) nuclei functioning in an environment with a clear order of subcomplexity of lower components (nuclei) is higher. The most common way to define the peculiarities of the current operation of cores is different types of nodes dynamically developing. This theory leads to the formation of a vision that tourism and recreation are developing within the framework of the hierarchical structure of tourist areas, in which large settlements are the cores that attract settlements of lower levels;

3) functionality of nuclei, which should perform the following functions: administration; cultural; health care; public institutions; organization of economic life; financial and trade; communications; production of products and services, etc. (table 1).

The settlements of lower levels perform functions of accommodation, food, and organization of excursions. The problem of the theory developed was the conditions of Southern Germany, where small cities are at a distance of 21 km from each other. Therefore, for tourist areas, there is always a minimum distance for trips to the tourist center (where there are the main monuments of history, nature, or modern man-made objects used for tourism and recreation purposes) [11; 7].



Table 1 - Functions of the central places of tourist territories (V. Kristaller)

Functions of the central places	Function characteristic
Administration	Administration from the head of the city to the supreme authority
Cultural	Cultural production at the level of public libraries, secondary schools, higher educational institutions, museums, theaters
Health care	Health care from a doctor, veterinarian, pharmacy, hospitals, specialized large clinics, sanatoriums, institutions of care
Public institutions	Public services of restaurants, local newspapers, entertainment institutions, large sports facilities, radio stations
Financial and trade	Financial and trade services of trade establishments, trade representative offices, banking institutions, wholesale warehouses
Production of products and services	Production of products and services from repair facilities, small mills, breweries, bakeries, power plants, transportation services; tourist insurance services; rental services
Communication	From railway stations, post offices, telephone centers, railway directorates

Source: [11; 7].

V. Kristaller formulated an abstract economic model for the region's development that does not exist in its pure form. In tourist territories in Ukraine regions, there are differences in landscapes, soils, and population density. Therefore, the location of large settlements is uneven, and the model of influence on the central places will not have the form of the correct hexes. Instead of a "balanced tree" network, nuclei networks or their combination (nodes) from the central place's theory. The characteristics of the central places theory network types oriented are present in table 2.

Table 2- The characteristics of the types of networks on which the theory of central places is oriented

The type of networks	Network type characteristic
double tree	the network is represented in the form of a tree, in which each central city has no more than 2 satellites
B-tree	a kind of balanced tree, in which each node can have many satellite cities, in practice up to a thousand, depending on the peculiarities of tourist areas
extension tree	view of unbalanced tree. Each node has a different number of satellite cities and is constantly expanding
“Balanced tree” core networks	the network is represented by small cities, located at a distance of 21 km. one from each other

Source: [12; 7]:



The above network types don't always act as a "root tree" namely a tree with bound acyclic graphs (central satellite places). The tree-like network part of central places as a separate tree can represent. The way of managing the networks of V. Kristaller is the influence on the central places (or service centers). [11; 3, pp. 19; 7]. However, if the latter is an element of an acyclic graph, the formation of influence should take into account the position of the city in the network (concerning settlements of descendants, settlements of ancestors, or both, as they are connected with relations of subordination).

Cores and nodes organizational networks in an acyclic graph don't have oriented cycles of management influence, that is, those that start and end in the same and the same central place. That is why it is necessary to step-by-step re-selection of network elements in the connection between the central places-ancestors and the central places-descendants.

2. Theory of spatial economic equilibrium (A. Lyosh, 1940). This theory is used for the development of tourism in the regions. This system of scientific vision is oriented toward the development of tourist territories taking into account the regularities of functioning, which are similar to the theory of central places. There are only certain provisions that are different in terms of influence on the networks of the regions of V. Kristaller, which in terms of the provisions of A. Losh influences tourist areas so that the form of outlined influence is formed in the form of a "nest of bee chairs" [13, p. 52].

In particular, the process of influence on central places (or service centers) is simplified. The influence should be based on the "demand cone" A. Lesha, according to which the volume of demand is represented in the form of a cone, the center of which is a market zone, which determines the proximity to the market of sales, optimal transport costs and population placement. Such an approach provides for the formation of influence not on the position of each city and its nodes in the network, but the information on the remoteness of the cities from the center of the circle [9]. The further from the center of the city circle, the higher the price for tourism services, and the lower demand for them. From such positions, there is a problem with the



development of tourism in those nodes of the network operating remote from the center of a circle of districts.

3. The theory of “growth poles” (F. Perrou, 1950). This system of scientific vision is oriented toward development in conditions when the transition from one state of production of tourist services to another is uneven across all regions of the region [2]. Such specificity is caused by the consideration of the expert of the system of scientific knowledge on inequality, as on the basic principle, which leads to changes in economic life in the region [2].

The theory has long roots because it began to form in the era of antiquity. In particular, during the times of the Mikenian civilization (Akheiska Greece, from XVI to XI century before our era) there was an idea of the “pole of growth”. Under this pole is the public form of development of the state, consisting of several rural settlements, which United around one city center. The specific thing is that Akheiska Greece was not a single state. The formation consisted of many small forms based on large cities. In the scientific works of F. Perrou, the theory of the Mikenian civilization has received further development, concerning the development of regions. At present, some provisions of the theory are close to real conditions, as the sphere of tourism in regions develops quite unevenly [14]. The spatial construction of the growth poles allows forming clusters in separate tourist areas, which correspond to the majority, but not the whole combination of features of the cluster. The theory of the poles of growth is even now used in modern France (since the poles of competitiveness are defined as protoclusters officially recognized by the state) [3, p. 49]. However, the application of the basic provisions formed by F. Perrou, in practice, complicates the specific approaches to the regularities of the functioning of the investigated area. Thus [3, p. 19]:

- growth policy is interpreted as a set of profile industries, growth center, and geographical interpretation of the profile pole;
- the impetus for tourism development is possible for a business to focus on promising directions of tourism activity.

The formation of managerial influence on the theory of “growth poles” is



provided by the model of influence on formed networks of growth poles and their environment. The problem is that such influence is oriented on the profile directions of tourist activity, which form a single-vector intensive form of concentration not only on the same area but also on its surroundings [1, p. 25]. This leads to the development of narrow-specific growth poles in the regions, as a result of which they are: Small-scale; do not allow maximum use of natural, human and integrative momentum of development; they are difficult to visit objects.

Other shortcomings in the formation of influence over F. Peru, are highlighted [3, pp. 20-22], [17, pp. 57-58]; [16, pp. 73-83], [4]:

- the removal of "growth poles" with "narrow-specialized nodes" or "tourist centers". Such opposition is inappropriate in connection with the orientation of the latter on one line of the tourist market;

- a hypothesis about the impossibility of forming poles of growth, while it is possible to have a purposeful influence on their formation, for example, based on the reasonable specialization of "growth poles" (based on assets and resources in the region).

4. Spatial interpretation of the theory of growth poles (G. Budville, 1986). Since 1950, many foreign countries have been falling into the industrial sector, and existing models of influence have not provided the desired results [3, p. 20]. These trends have been found reflected in the works of G. Budville, who proved that "growth poles" are not abstract sets of profile industries, but specific territories that serve as a source of innovation. Followers of the theory of the poles of growth G. Budville can be considered:

- V. Soleta, A. Faluase (the theory of spatial planning, which is oriented on development based on the created spatial plan within which the branch, which is available within the regional space and the policy of their development are agreed);

- M. Geddes (the theory of "local partnership oriented toward the development of territories due to links between the strongly and low-developed territories, which based through established partnership relations [1]);

- K. Frederickson and L. Lindmarka (local industrial specialization, oriented on



the development of territories within the framework of a closed industrial network with the dominant industrial branch, which demonstrates creative and intellectual potential) [4].

K. Frederickson and L. Lindmark used the term cluster for the first time to indicate the “growth poles” in the regions with institutionally, economically and socially related processes [3, p. 96].

In the development of tourism, within the framework of such interpretation of “growth poles” in the regions, there are certain regularities, namely [3, pp. 20-22; 4]:

- growth poles based on developed territories, which differ by the constant creation and introduction of innovations, and the highly innovative abilities of participants. According to recent studies, the conditions for innovation are based on the presence of a nucleus within the growth pole, namely the developed research sphere (which can be formed based on universities, and research institutions, which later will be determined by the parts of the cluster core by the followers of G. Budvilla);

- the growth poles can be formed based on multi-profile tourist territories, developing within urban areas with developed tourist infrastructure.

The theory development is provided based on the model of influence on the nuclei of growth poles within the urbanized territories. The constant influence on the generation of innovations can contribute not only to the development of tourism in the region.

In several cases, innovation processes can lead to isolation or even destruction of “growth poles” namely, [18, pp. 64; 19, pp. 232-233]:

- insufficient level of development of the institutional environment, actions of corruption mechanisms in part of government guarantees, holding tenders;

- insufficient level of investment attractiveness of regions, lack of access of cluster participants to credit or other resources, etc.;

- the reduction of the effects of innovation by one of the economic actors of the growth poles (for example, by the tourist product producer).

In market conditions, economic actors of the “growth poles” may not always be



subordinated to a single strategic goal. There are no cases when a strong economic entity captures and maintains the internal resources of the pole to the detriment of other entities [20, p. 65]). The collapse of the growth pole could lead to economic transformation, which reversal of development.

Spatial interpretation of the theory of growth poles G. Budville can be implemented in practice as a theoretical platform for tourist and hotel-restaurant clusters development in the regions [18, p. 64; 4]:

- According To the provisions Of G.e. Masneva;
- On The positions And. Tolenardo and D. Sola.

According to the scientific knowledge system developed By G. Masnev, this is possible due to the following specificity of influence [18, p. 64]:

- the influence aimed at ensuring the synchronicity of the innovative growth of economic entities of the "growth poles";
- influence aimed at stimulating the development of closed technological chains from highly profitable innovation enterprises;
- influence aimed at concentrating the targeted influence on the relationship between the growth poles.

The J. Budville theory's drawback is its ability to form a theoretical platform for the tourist and hotel-restaurant clusters development, which is oriented only on highly profitable participants. The merger of high-margin, low-cost, and unprofitable business entities is practically impossible, as a result of:

- 1) unequal security of deficit resources;
- 2) different orientation of interests, distrust of business losses;
- 3) reduction of the effects of innovation present in the closed technological chain of low-cost and unprofitable business entities.

According to the theories of T. Hegerstrand and F. Peru, the model of H. Hirsh "Volcano" formed. This system of scientific vision is oriented on the territory, on which the pole of growth is the big city agglomeration with developed tourist infrastructure and scientific basis, which is a source of expansion of innovations to the periphery (like the eruption of a volcano), produces the development of the



economy of the region [4].

5. The theory of “diffusion of innovations” (T. Hegerstrand, 1950). This system of scientific vision is oriented toward tourism development in the regions using the wave principle [3, pp. 20-25]. Cluster development within such an interpretation will have certain regularities, namely:

- development is not the same (it does not start simultaneously on the whole territory of the region). It is certain places starts, from which the region using the wave principle;

- the wave process can be started by the development of innovative clusters or other entities, which are necessary to provide the first stage of development of the tourism sphere. Namely, to start the process of diffusion of innovations.

The formation of influence on the theory of "diffusion of innovations" is based on the model of stimulation of clusters development and is based on the transition from the small wave of innovations to the large wave of innovations.

Small waves of innovations affect only the cluster itself. This process leads to a sharp contrast between the cluster itself, which is the source of the innovation expansion, and the peripheral tourist territories.

Big waves should touch the cluster and the peripheral tourist areas, leading to their agitation on the innovative sign.

The final combination of large and small waves of innovations should lead to cluster expansion, which are sources of innovations.

Development of tourist and hotel-restaurant clusters within the framework of the theory “diffusion of innovations” T. Hegerstrand has the same disadvantages as the spatial interpretation of the theory of growth poles G. Budville.

1.3. Theories of tourism development through the integration of systems of tourist-attractive territories

The study considered theories of the development of the tourism sector through the purposeful influence on the mutually dependent system of tourist-attractive



territories using the consistent integration of their economic space. These theories considered the tourist region uses the combination of districts, sub-districts, separate resorts, natural parks, recreation zones, tourism centers, and specific territorial combinations of other features. This theory led to the spread of clusters and similar structures and the development of network structures in the tourism area.

1. Theory of cumulative growth (G. Myrdal, 1957). This scientific vision system focused on tourism development in certain areas of the tourist region as a result of the effect of the concentration of enterprises.

The theory of cumulative growth was formed under the influence of the ideas of E. Hoover and A. Marshall (1950-1960). The theory is a response to an attempt to explain the phenomenon of geographical proximity of enterprises and the characteristic restated phenomenon of effects, determined by the combination of other traits [4]. The formation of such effects is characterized by the following regularities:

- large tourist areas (within developed regions) are attractive for the placement of new enterprises in the tourism and hotel and restaurant business [3, p. 20]. The attractiveness of the territories is determined by the presence of places of geographical concentration of tourist resources and objects of tourist interest, as a result of which it is possible to get an economy on production and transaction costs in activity [4]. Tourist territories, which exist within the borders of the underdeveloped regions, form a lower economy on production and transactional costs, but even a minimal saving time can contribute to enrichment;

- the action of market forces leads to the minimization of the attractiveness of activity within tourist territories of underdeveloped regions [3, p. 20]. In the opinion of G. Myrdal this is due to labor migration processes (since skilled workers transferred from the lagging regions to the leading ones);

- capital migration since financial institutions use savings of less developed regions to finance investment projects in more developed regions, etc. [4; 3, pp. 20-21].

Formation of influence on the theory of cumulative growth is oriented on the



effect of Manro or stimulation of development of tourism of the leading regions, by concentration on formation, promotion, and realization of tourist product (to increase the economy of production and transaction costs). The problem with the theory is that the development of tourist and hotel-restaurant clusters form opportunities to develop regions equally, which is an inseparable element in the social-economic policy of civilized countries [20, p. 22].

2. The theory of “center-periphery” by (J. Friedman, 1966). The theory of “center-periphery” has developed in the works of scientists [21, p. 124]:

1) the Anglo-American geopolitical school, among which X. Mccinder (1861–1947), A. Mehen (1840–1914), N. Spicman (1893–1943);

2) the German geopolitical school, among which F. Ratzel (1844–1904), K. Hausofer (1869–1946), K. Schmidt (1888–1985).

Modern followers of J. Fidman should be considered such researchers as O. Kozyrev, A. Kozyrev, O. Gritsai, G. Ioffe, and A. Treyvis [21, p. 124; 4].

The system of scientific vision is oriented on differentiation of models of tourism development of the region, depending on types of networks of subdistricts, networks of separate resorts, networks of natural parks, networks of recreation zones, and networks of tourism centers. In aggregate, these networks should be attractive for development.

Based on the outlined peculiarities of the development of districts, the theory proponents focus on the formation of the center peripheral structure. According to the scientific positions of J. Freeman, such elements' structures can be distinguished:

- tourist areas of the core are where the networks of mutually dependent subjects are concentrated on the creation of additional cost, the introduction of innovations, and innovative abilities;

- tourist areas, growing (these are semi-peripheral and peripheral areas, which border with tourist areas' cores).

This boundary creates preconditions to:

- Increase in the number of tourist areas of new development (territories where the previously unoccupied lands are developed and populated);



- increase in the number of depressed tourist areas (these are the peripheral areas with the settlement system, characterized by the low-developed tourist infrastructure and the system of tourism organization) [9].

O. Gritsai, G. Ioffe, and A. Travis conducted the distribution and characterization of subtypes of the center peripheral structure in the cut: Resort center (multifunctional); non-semi-periphery (old industrial); periphery (rural centers) [4]. According to the theoretical provisions, development in networks will have certain regularities [9; 5, p. 21]:

- the establishment of a center-based peripheral structure or structure uniting networks of central and peripheral tourist areas in the process of their development is inevitable. The forces of the market economy will work against the convergence (convergence of the level of development) of the center and periphery, in connection with its specific features (namely, weak internal integration of economic entities, traditional population, low level of socio-economic development, etc.);

- the inevitable is the absence of automatic mechanisms that can lead the national economy to a balance that is characterized by a convergence evolution (convergence, convergence of signs and elements) between the central and peripheral regions. The processes of convergent evolution are initiated by active state intervention in regional development.

According to the J. Friedman theory the influence is purposeful and centered on the peripheral structures, with the help of measures [3, p. 21]:

1) liquidation of periphery or its transformation into a system of urban regions (based on stimulation of development of new supporting regions on the periphery and their transformation into clusters);

2) integration of economic space (integration of the center and periphery into clusters) using the possibilities of the geographical division of labor in creating additional value process.

Within the sequence of development models "center-periphery" clusters vary from small, medium (in limited geographical zones) to "mega-clusters". In this case, cluster and non-hierarchical clustering are mechanisms for the intensification of



tourism development.

3. Theory of self-development of regions (P. Romer, 1986). This theory arose as a result of an increase in the number of tourist regions, which sought to self-develop, and increase competition between them [3, p. 21]. The theory contained research on the cluster model from the position of the endogenic equilibrium in the region. The following scientists are followers of the theory: I. Vakhovic, M. Zabiuk, Z. Varnaliy, O. Balatsky, E. Zabarna, T. Cloba, A. Vdovichin et other [4]. The balance formation is characterized such regularities in ensuring the self-sufficiency of tourist regions [22, p. 41]:

- each area can achieve a balance between the aggregate local resources and their effective use;
- in each area, it is possible to achieve a balance between the identification and attraction of the territory development reserves;
- every district in the region needs protection from the fighting.

The formation of influence within the framework of the theory of self-development of regions is oriented toward the development of sub-districts, which generalizes networks of separate resorts, natural parks, recreation zones, and tourism centers. The impact aims at increasing the number of jobs without environmental damage (all economic entities must be responsible for the losses they cause).

The problem was the amorphism of influence, which led to the search for ways of its structuring. In particular, the follower of the theory of self-development of regions M. Enright, studying the geographical scale of competitive advantages, concluded the existence of a regional cluster, can overcome the problem of management amorphousness [25, p. 98]. In the theory of endogenic development views on achieving self-sufficiency in tourist regions have changed into the area of clustering [23; 24, p. 107]).

According to scientific provisions, M. Enright's competitive advantages of tourism are created not at the national level, but at the regional level (where local combinations of other features play a major role). Regional clusters should be the basis for the self-development of regions. In particular, the experts of the European



Commission have developed a scheme of "ideal regional cluster", which outlines the stages of influence on the self-development of the regions of the P. Romera [23, p. 98]:

- 1) stimulating the formation of pioneer firms based on local specific skills of tourist product production;
- 2) stimulating the processes of establishing the system of suppliers and specialized labor market;
- 3) creation of new organizations to support economic entities;
- 4) attraction of external economic entities;
- 5) creation of innovative knowledge, stimulation of diffusion of innovations, information, and knowledge;
- 6) prevent the cluster from developing its innovative potential and its decline.

4. Theory of sustainable development (V. Vernadsky, from 1970 to 2000). Since 1970, become obvious: the advantages of cluster development; (allocated by M. Feldman. D. Odretch); the negative impact of economic growth on the environment of tourist regions; the need to combat the environmental consequences of the outlined processes [3; 4].

In such conditions M. Feldman. and D. Odretch, at the end of 1990 the sequence of evolution of cluster models from endogenic (self-sufficiency oriented) to innovative (effect-oriented) [23, p. 98]. As means of evolution, the properties of geographical concentration and its influence on the formation of motivation in economic subjects to the sustainable development of the region were considered. Influence of scientific works M. Feldman and D. Odretch led to the fact that the system of scientific vision V. Vernadsky reoriented models of tourism development in regions from amorphous to process (oriented on innovation processes and aspiration to harmonization in social, ecological, and economic spheres) [4].

Modern followers of the theory of sustainable development V. Vernadsky should be considered: A. Aliyev, V. Samfatova, W. Cocolenko, I. Fedorenko, A. Goiko, I. Jebel, K. Hurtaev, F.Kuk and others [4; 9]. This system of scientific vision is oriented toward the development of tourism in the region, which is characterized



[3, pp. 20-22]:

- the laws of influence on innovation processes, which are the basis of the balance between the satisfaction of the needs of society and the protection of interests of future generations;

- by the laws of the state regulation to concentrate efforts on the organization of socio-economic growth and increase of competitiveness in the conditions of international integration (through regulation and system of unified power).

The formation of regulatory influence within the theory of sustainable development of regions is provided with the help of tourist and hotel-restaurant clusters or connected with clusters of categories. These categories are seen as an entity that need protection from failures. The activities of such organizations are connected with the overcoming of uncertainty.

In the situation of choice between a significant number of development options, financial, investment, operational, commercial, interest, innovative, production, and currency risks. This provides economic growth, competitiveness enhancement, and specific information space that forms economic actors with incentives for sustainable development [25, p. 136]. F. Kuk also proposed innovative chains within the framework of tourist and hotel-restaurant clusters, which include economic entities generating knowledge [3, p. 21].

5. Theory of balance-bearing systems (Bronshpak H. and Chernyshova S., 2009). Since 2009, it has become evident that the interaction between the participants of the tourist and hotel-and-hotel cluster forms such an internal environment, which needs protection from failures, through effective organization of economic activity. As means of ensuring such efficiency, scientists proposed using the balance-sheet systems Leontief. The model allows building the process of distribution of incomes between elements of a cluster to the decision of a system of algebraic equations. This system of scientific vision is oriented toward the development of tourism in regions, which is characterized by [26]:

1) the effectiveness of the system of balance of the working load will show the positive values of the elements, which make up the value of the products;



2) the effectiveness of clusters in the national economy is ensured according to their internal development, functioning, and state support according to the following criteria:

- the development supported by all the members of the cluster (in particular, their main interest is indivisible; coordination of actions of all the participants, on the part of the single body of influence; control of the single body of influence on the market of services of non-regional competitors);

- functioning (organizational and coordination role of local government bodies; availability of developed normative documents on cluster development; development of normative documents on cluster planning and support; formation of "target tree" of regional development and coordinated vision of cluster, where all participants could unite with the purpose of positive changes);

- state support (subsidies and preferential taxation of enterprises, infrastructure provision by the state, creation of research developments, the introduction of innovative scholarships, guarantees for scientific programs; crediting of small and medium-sized businesses).

The formation of influence within the theory of sustainable development at the regional level is provided by tourist and hotel-restaurant clusters, which are considered as the formation, where there is a cluster administrative subsystem and administrative subsystems of cluster participants. They realize their own strategic goals through its structure. It is necessary to provide a synthesis of knowledge on the processes of position coordination and co-legal decision-making on cluster development and coordination of actions of its participants on risk minimization. There is a need to distribute the workload between the cluster elements.

Analysis of the theoretical platform of development of tourist and hotel-restaurant clusters in regions allowed to offer a theoretical and applied understanding of the nature of their economic activity as entities, which need protection from failures in development and functioning.



Conclusions

The best theory of regional development of tourism is a system of balance relations between Bronshpak H. and Chernyshova S. According to this theory, the development of tourist and hotel-restaurant clusters provides (based on the theory of balance-bearing systems) for orientation on the general logic of the interconnection of the cluster participants, which forms an internal environment that requires protection from failures. Thus, the theory of balanced relations systems should be the basis of the theoretical platform for the development of tourist and hotel-restaurant clusters in regions, which defines the aggregate of actions on their development in time and regional space and organizational structure of influence, which is formed and transmitted through the institutional environment.

In the conditions of application of the theory of balanced relations systems, a new approach to regulation of development of tourist and hotel-restaurant clusters is formed, which provides the need for their protection from failures and overcoming of uncertainty due to actions on minimization of risks in the activity of each participant, ensuring high quality of tourist product produced. The updated priority of regulation of development of tourist and hotel-restaurant clusters is the influence on the environment of realization of tourist products (within the framework of a single process involving all participants of the cluster and their formation by territorial units of the primary level).

The system of regulation of the development of tourist and hotel-restaurant clusters, based on the theory of balanced cooperation systems is formed by taking into account the following principles:

- production and sale of joint tourist products, which correspond to market expectations and needs of target consumers of the cluster, its production possibilities in the region;
- constant improvement of components of the tourist product, mechanism of its realization;
- joint strategy and tactics of the participants, which provide flexible response to changes in the market environment;
- joint branding of tourist products in the region.



References

1. Storonyanska, I. (2009), "Interregional integration processes in Ukraine: trends and development prospects". Lviv: IRD of the National Academy of Sciences of Ukraine.
2. Robert M. Solow. A (1956). Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics*. 70(1). pp. 65-94
3. Kovbasyuk, YU. V., Vakulenko, V. M. and Orlatyy, M. K (2014). *Rehional'ne upravlinnya [Regional administration]*. Kyiv.: NADU.
4. Masligan, O.O. and Medved, L.I. (2020), "[Theoretical platform of management of development of tourism and recreation clusters in regions". *Efektivna ekonomika*, vol 3, available at.: <http://www.economy.nayka.com.ua/?op=1&z=7720>
5. Liba, N.S. (2016), "Systematization of theories of regional development in an evolutionary order". *Naukovyy visnyk Mukachivs'koho derzhavnoho universytetu*, vol. 2 (6), pp. 137-142.
6. Kobzova, S.M. (2010), "Concepts of "tourist region", "regional tourism" and "tourist route" in modern scientific discourse". *Visnyk LNU imeni Tarasa Shevchenka*, vol. 16(203), pp. 24-31.
7. Dyachenko O.V. (2011), Application of the theory of central places in archeology to determine the relative dates and sizes of settlement. *Arkheolohiya*, vol. 3, pp. 3-10.
8. Yevtushenko, V. A. (2016), "Determining the level of social responsibility of the countries of the world using clustering methods". *Naukovyy visnyk Uzhhorods'koho natsional'noho universytetu*. vol. 6(1), pp. 97-104.
9. Golubchik, M.M. , "Socio-economic geography", available at.: https://stud.com.ua/26382/geografiya/teoriya_tsentralnih_mists_kristallera_losha
10. Malska, M.P. (2012), "Theoretical principles of accommodation of tourism industry enterprises" *Ekonomika. Upravlinnya. Innovatsiyi*, vol. 2(8), available at.: http://tourlib.net/statti_ukr/malska2.htm
11. Horshkova, A.O., Kapranova L.G. (2012) "Cluster: concept, types, conditions of emergence and formation". *Bulletin of the Moscow University of Finance and Law*, vol 2, pp. 52-61.
12. Golikov, A. (2018), "Using the theory of central places to improve the administrative and territorial structure of the Kharkiv region", *Chasopys sotsial'no-ekonomichnoyi heohrafiyi*, vol. 24. pp. 47-55.
13. Fedorova, V.G. (2011), The evolution of classical theories of network and cluster forms of production location. *Ekonomika i rehion*, vol. 2 (29), pp. 51-54.
14. Poguda, N.V. and Rozmetova, O.G. (2018), "The current state of the tourist market of Ukraine: assessment and prospects for development", *Efektivna ekonomika*, vol. 10, available at.: http://www.economy.nayka.com.ua/pdf/10_2018/59.pdf
15. Artemenko, I.S. (2016), "Theoretical and methodological bases of concentration of production at enterprises of the agro-industrial complex", *Scientific notes of the National University "Ostroh Academy"*, vol.1(29). pp. 23-28.
16. Dunaev, I.V. (2017), "Designing a complex mechanism for the modernization of public regional economic policy", *Derzhavne upravlinnya ta*



mistseve samovryaduvannya, vol. 3(34), pp. 73–83.

17. Dunaev, I.V. (2019), “Clusters and the first strategies of smart specialization for Ukrainian regions: designing transformational changes”, *State administration and local self-government*, vol. 1(40), pp. 57-64.

18. Maznev, G.E. (2013), “Innovative technology clusters: features and caveats: features and caveats”, *Ekonomika APK*, vol 8, pp. 63-67.

19. Farat, O.V. and Zalutskyi, V.P. (2015), “Problems of development of innovative clusters of industrial enterprises”, *Aktual'ni problemy ekonomiky*, vol. 2(164). pp. 229-237.

20. Dutchak, O.I. (2012), “Tourism as a factor in the development of backward depressed areas; international aspect”, *Aktual'ni problemy ekonomiky i sotsial'noho rozvytku rehionu*, vol. 1, pp. 20-23.

21. Kozyreva O.V., Kozyreva A.K. (2017), “Study of approaches to determining center-periphery relations between regions of the country”, *Scientific Bulletin of the Uzhhorod National University*, vol. 13(1), pp. 124-129.

22. Vakhovich, I.M. and Zabedyuk, M.S. (2010), “The content and structure of the endogenous potential of the region”, *Ekonomika ta derzhava*, vol. 11, pp. 41-43.

23. Reshetnyak, O. I., Zayika YU. A. (2018), *Ekonomichnyy mekhanizm formuvannya osvitnikh klasteriv v Ukrayini: monohrafiya* [Economic mechanism of formation of educational clusters in Ukraine]. Kharkiv: Publication of the National Academy of Sciences.

24. Vdovichen, A. (2014), “Exogenous and endogenous character of elimination of disproportional socio-economic development of regions of Ukraine. Tourism”, *Rehional'na ekonomika*, vol. IV (56), pp. 97-111.

25. Stepanova, A.N. (2009), “The influence of the company's financial architecture on its strategic effectiveness”, *Finansy i Kredit*, vol. 44 (380). pp. 38-45.

26. Bronshpak, G.K. and Chernyshov, S.I. (2009), *Model' Leont'yeva v mikroekonomike, strategiya upravleniya deyatel'nost'yu klastera molochnogo profilya: monohrafiya* [The Leontiev model in microeconomics, the strategy for managing the activities of a dairy cluster: monograph]. Khar'kov: AO «Nauchno-tekhnologicheskyy institut transkriptsii, translyatsii i replikatsii»



CHAPTER II.

ALGORITHMS FOR THE CREATION OF TOURIST AND HOTEL-RESTAURANT CLUSTERS IN REGIONS

Introduction.

The basis of the state regulation of tourist and hotel-restaurant clusters is specific spatial processes, which determine their functioning and development. In particular, on the processes of:

- cluster creation;
- cluster identification;
- cluster regulation.

At the same time, it is problematic that in modern economic conditions these practices concerning the sphere of tourism in the regions of Ukraine are not regulated. At the same time, the functionality and effectiveness of cluster development depend on how much a complex of measures on the part of the state to correct and establish passive instructions on their reality and specificity. Therefore, the research of the selected processes is topical. Their characteristic features from the need to expand the theoretical and applied picture of the peculiarities of functioning, development, and creation of the basis for state regulation.

The legal object of the research of such processes is those that determine the functioning and development of clusters (hereinafter - PFDC). PFDC is based on system-based correction and passive instructions that affect creation, identification, and management. Under the processes of creation of tourist and hotel-restaurant clusters understand the specific process of changing the environment of the tourism subjects.

The result of such processes is a new, progressive process of transition from simple to network structures, from simple to complex (multi-dimensional) character of interactions. The cluster identification should be understood to establish the unity of a wide range of participants, with cluster attributes, based on the coincidence of signs. The regulation of the cluster should be understood as a purposeful influence on



the connection of enterprises and individuals, for their purpose set on the common goal.

2.1. Algorithm for creation of tourist and hotel-restaurant regions clusters in regions of Ukraine

The process of creating a tourist and hotel-restaurant cluster in the regions of Ukraine is determined by the sum of the steps required to initiate the process of transition to network structures, from simple to complex interaction.

These processes define the specific connection between the parameters of these processes and the integration of changes. According to the world standards [1], the outlined process should be defined in the 5 basic stages of cluster environment change (table 1). These stages should allow to passing the path of changes from the definition of potential participants of the cluster to the determination of the mechanism of integration of their efforts.

Characteristics of the algorithm for the creation of a tourist and hotel-restaurant business cluster in Ukraine are as follows [2]:

1. Model definition or transformation. The processes involve self-identification of potential participants of the cluster, which takes place only at a high level of initiative and internal organization of business entities. Therefore, to initiate the formation and transformation of the cluster model, the process of the internal organization of business entities (even at an advantageous geographical location, with the availability of a significant number of prerequisites) must be ahead of their spatial association, which acts as a coordination center.

2. Formation of cluster network at the horizontal level requires the business entities' identification that forms the basis of a horizontal association. The network can include [3]: suppliers of specialized factors; service providers; sales or consumption of services; specialized infrastructure providers and infrastructure agencies.



Table 1 - Characteristic algorithm of creation of tourist and recreational cluster in Ukraine

Stages of cluster environment change	Basic changes	The basic goal of consistent changes	The specifics of establishing a connection between the parameters of these processes and integrating changes
Model definition or transformation	Identification of potential participants of the cluster	Integration of leading participants and others that are in the common value chain	To initiate cluster formation, it is necessary to create a community of citizens with the function of a coordination center or cluster Council.
Formation of cluster network at the horizontal level	Defining the cluster participants, which is the basis for horizontal association	Integration of participants on the same sales channels; issue of additional products and complementary services	To establish horizontal associations, it is necessary to identify all participants of the distribution channel and to ensure the identification of mutual benefits.
Formation of a cluster support network	Identify the organizations that will support the cluster	Integration of participants in the functions of providing: Special knowledge and technologies; information; capital; infrastructure; service	It is necessary to form the basis for the realization of innovations, the inflow of investments, development of entrepreneurship. It is needed assistance from authorities, scientific and educational institutions, etc.
Formation of the organizational structure of influence	Definition of a common organizational structure of regulation	Integration of participants to regulate the processes of operation and development	Organizational regulation of their functioning and the development of the cluster is necessary.
Formation of the system of regulation by the network structure	Defining the mechanism of integration of efforts	Integration of the participants to ensure their viability and sustainability	It is necessary to form a regional paradigm for the formation and development of clusters based on an effective strategy of protection against failures.

Source: [1].

At the same time, it is necessary to create a climate of trust and information “transparency” for business, since all participants of the horizontal association should receive clear and predictable benefits. The benefits of cooperation are not obvious. To establish horizontal associations, it is necessary to clearly define all participants of the distribution channel and to ensure the identification of the received movement.

3. Formation of a cluster support network. The stage requires the return in the form of innovation realization, investment inflow, and development of medium and small businesses. For this purpose, the assistance of the authorities, financial and



banking structures, cooperation with existing scientific and research institutions, and innovative infrastructure is necessary. The study of structural models of clusters in Ukraine reveals the absence of associations that have a developed network of support of scientific institutions and innovative infrastructure. Clusters cooperate with research centers and universities, only within the framework of state target programs, if it is included in the list of priority directions for the development of science and technology. Such programs can be formed only on a competitive basis by the central executive body in the field of science and innovation and approved by the decision of the Cabinet of Ministers of Ukraine. The state support of such cooperation and innovative activity of the cluster is complicated.

4. Formation of the organizational structure of influence. This process leads to the complication of organizational structures of regulation by the activity of participants of a cluster, in connection with non-regulation of the order of their activity. Thus, participants of the current clusters don't support organizational regulation of development. In this regard, the process of work within the institutions and at the level of each particular participant is realized based on chaotic processes. At the same time, the cluster's central leadership generates chaos of regulation. Also, the goals, tasks, rights, and duties of the participants are not defined. In such conditions, organizational regulation of the development of participants operating under the cluster environment is required. It is advisable to apply the system of internal organizational regulations.

5. Formation of the system of regulation by the network structure. In the domestic clusters, it is possible to predict the connection of the spread of negative events, within a relatively small period. Therefore, regulation is effective only if the cluster's viability and sustainability are provided. It is necessary to form a paradigm of regulation of the development of clusters, which is based on an effective strategy of protection against failures.

Accordingly, the algorithm of providing a systematic approach to cluster creation can be detailed in the composition of such actions:

- definition or transformation of the model of tourist and hotel-restaurant cluster



(these actions are aimed at joint organization of economic entities' activity);

- development of the tourist and hotel-restaurant cluster network on a horizontal level (these actions are aimed of establishing horizontal associations);

- development of the network of support for the tourist and hotel-restaurant cluster (these actions form a basis for innovation realization, investment inflow, enterprise development);

- development of the organizational structure of the management of the tourist and hotel-restaurant cluster (the actions are aimed at joint organizational regulation of functioning and development of clusters);

- development of the system of regulation by the network structure of the cluster (actions form of the regional paradigm of formation and development).

The approach to the algorithm of formation of tourist and hotel-restaurant clusters in the regions of Ukraine is formed by the combination of forming, revealing tendencies of change of processes of their functioning and development. The region's organizational principles of cluster formation are shown in the figure. 1.

These guidelines define a comprehensive set of instructions for the steps required to resolve the tourist and hotel-restaurant cluster creation task in the following directions:

- steps to define or transform a cluster model in the region;
- steps to develop the region cluster network at a horizontal level;
- steps to establish a region cluster support network;
- steps to develop an organizational structure for the regulation of cluster development;
- steps to achieve unity of influence on the cluster network.

In aggregate, this set of instructions provides the need to protect against the effects of domino. This means that there is no chain spread of the crisis under the influence of a negative factor that affects each participant.

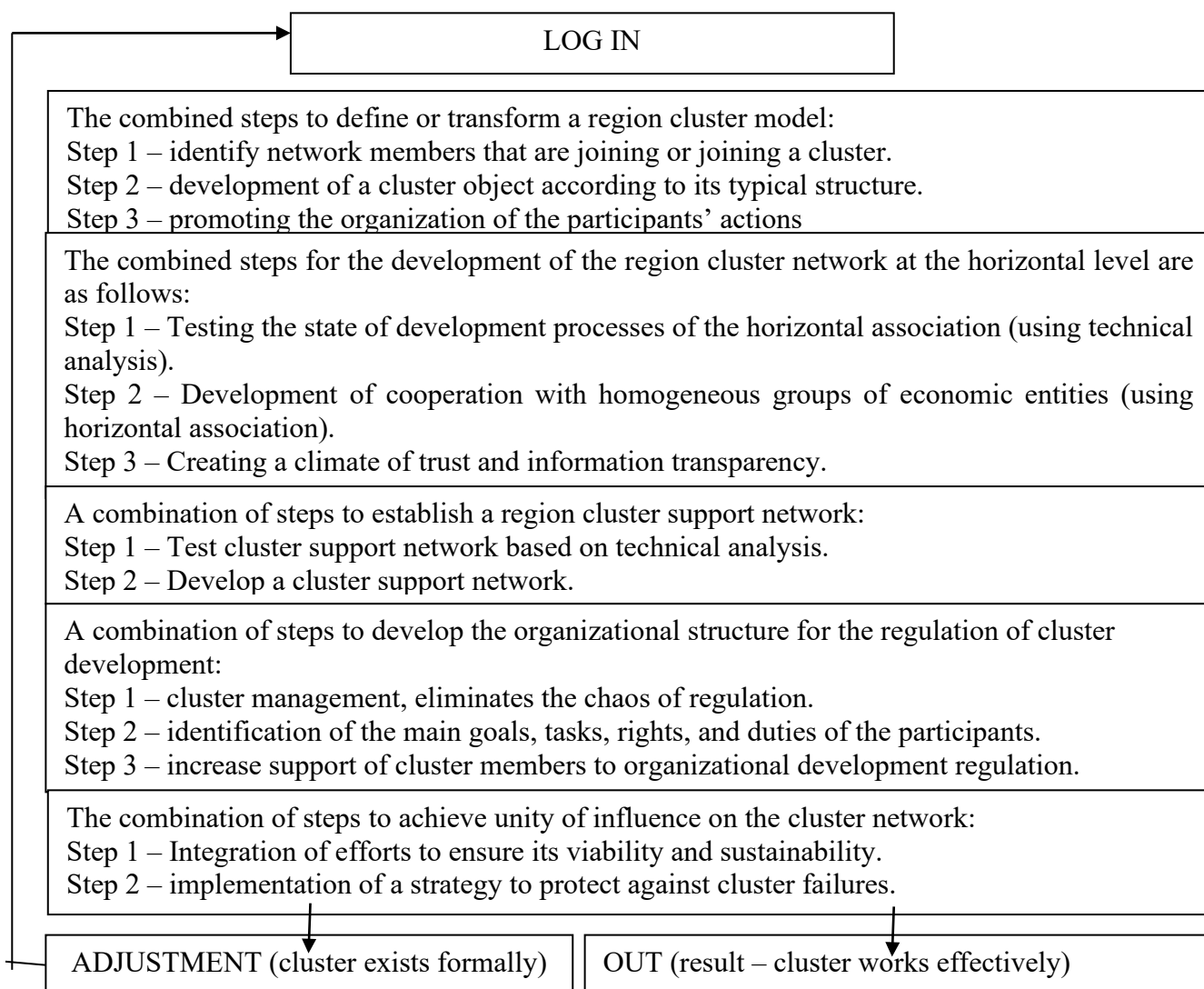


Figure 1. Organizational principles of formation of tourist and hotel-restaurant cluster in the region

Source: [4; 5; 6].

2.2. Algorithm of determination or transformation of tourist and hotel-restaurant cluster and formation of its network at a horizontal level

Today for Ukraine to spread the experience of clustering, it is necessary to distinguish the algorithm of definition or transformation of the tourist and hotel-restaurant cluster and the formation of its network at the horizontal level. The outlined process is recommended for the following combined steps:

Step 1: Identify the base or new members associations or joining the cluster. To



this end, an initiative group of participants is formed and a joint agreement is formed for their participation or accession to the cluster (which is approved by the signature in the minutes of intentions);

Step 2: Development of a tourist and hotel-restaurant cluster object according to its typical structure.

Step 3: Assistance in raising the level of organization of network participants based on the creation of the coordination center (it is necessary to develop the statute, organize the setting meetings and conduct registration).

The formation algorithm is effective only at a high level of organization, which is not characteristic of potential or participants of the cluster.

Even with an advantageous geographical location, and a significant number of prerequisites for forming and transforming the cluster model, it is necessary to create a union of participants, which performs the functions of the coordination center [7, c.580-583]. The steps set to form a network of a tourist and hotel-restaurant cluster on a horizontal level are as follows:

Step 1 - Testing the state of development of the horizontal association using technical analysis (with the help of the trend lines). The trend is a line of formation and development of a cluster network at a horizontal level, along which points representing data by economic subjects are located.

Step 2 – Development of cooperation with the homogeneous groups of economic entities that form the basis for the horizontal association on a contractual basis. The network should include such economic entities [8]:

- suppliers of specialized factors;
- service providers;
- sales or consumption of services;
- specialized infrastructure providers and infrastructure agencies.

Step 3 - creating a climate of trust and information “transparency”, since all members of the horizontal association should receive clear and predictable benefits. The formation of the network is possible when potential members of the distribution channel are interested in cooperation. If there is no climate of trust and information



“transparency” the benefits of such cooperation are not obvious. To establish horizontal associations, it is necessary to identify the participants of the distribution channel and to ensure the identification of the benefits they receive.

2.3. Algorithms for the formation of a network of support for tourist and hotel-restaurant clusters in the region

The set of steps for the formation of a support network for the tourist and hotel-restaurant clusters is as follows:

Step 1 - cluster support testing through technical analysis of change trends (using trends). The trend should be seen as a line of formation and development of the cluster support network, along which are located points representing data from several data by subjects. The currency is given as to the profitability of innovations, the inflow of investments, and the development of entrepreneurship.

Step 2 – Develop a cluster support network. For this purpose: Assistance of state and regional authorities; participation of financial and banking structures; cooperation with existing scientific and research institutions and educational institutions and innovative infrastructure. This is possible at the initiation of joint projects.

The formation of structural models of tourist and hotel-restaurant clusters of Ukraine is effective only with the presence of associations that have a developed network of support of scientific institutions and innovative infrastructure. The problem is that the cooperation of the cluster participants with research and educational universities, within the framework of innovation activity, is possible only by priority directions of science and technology development, according to the state scientific and technical programs.

Such programs can be formed only on a competitive basis by the central executive body in the field of science and innovation and approved by the decision of the Cabinet of Ministers of Ukraine. This is defined by the Law of Ukraine " On scientific and scientific and technical activity", the Law of Ukraine "On priority



directions of development of science and technology", the Law of Ukraine "On innovation activity". The state support of such cooperation (by the current laws), as a result of the innovative activity of the cluster, is complicated. Funds for implementation of target programs are determined at the adoption of the state budget for the next year, after which, it is possible to approve the priority directions (within the framework of the competition to define the list of cooperation programs). The Cabinet of Ministers of Ukraine is carrying out a competition of objects for the realization of state scientific and technical programs when selecting programs and their approval. The Law of Ukraine "on innovative Activity" allows the realization of cooperation of participants of the cluster with educational institutions. Work is possible within the framework of formation and realization of state, branch, regional, and local innovation programs, with their support through tax stimulation, protection of intellectual property, direct financial support, etc.

However, specific mechanisms of program formation and financing mechanisms are not allocated by law. The additional restriction of cooperation is the norms of the laws "On priority directions of science and technology development", "on priority directions of innovation activity in Ukraine" and "On a special regime of innovative activity of technological parks". The laws state the requirement of cooperation exclusively in the form of an innovation center, business incubator, technopolis, or technopark. Cooperation is possible after the examination of state scientific and technical programs.

2.4. Organizational algorithms of regulation of development of tourism and hotel-restaurant cluster. Algorithm of cluster identification.

The combination of steps in the formation of the organizational structure should not complicate the relations of wine-making and determination of the tourism and hotel-restaurant cluster and regulation of the order of its participants' activity. It requires:



Step 1 – the organization of the central leadership of the cluster (eliminates the chaotic influence on the achievement of completeness and certainty).

Step 2 - identification of the main goals, tasks, rights, and duties of the participants. Under such conditions, organizational regulation of the development of participants operating under the cluster environment and regulation of business behavior of participants is required.

Step 3 – work to increase the level of support of the participants of the clusters of organizational development regulation.

The process and procedure of work within the tourism and hotel-restaurant cluster and at the level of its member is effective if implemented based on regulated processes. It is expedient to apply the system of internal organizational regulations. These regulations regulate the operation of the cluster development regulation apparatus, accounting process, participants' functioning, etc.

A combination of steps to achieve unity of impact on a cluster network is necessary because the implicit link between the spread of negative events and a short period is unobvious. For this purpose, to manage the strategic center effectively necessary, based on:

Step 1 - integrate efforts to ensure its viability and sustainability.

Step 2 - an effective strategy of failure protection in the cluster development management paradigm implemented.

The systematized aggregate of actions to identify tourism and hotel-restaurant cluster as a system summarizes:

Step 1 - assessing the potential of the cluster development in the regions. The need for assessment is emphasized by the fact that their formation in the territory where there is a qualitative core of their development. The cluster core is a combination of valuable tourist resources, namely natural (water, balneological, forest, climatic) and artificially created by man (historical, cultural, and infrastructural). At the same time, these resources form the core of the cluster and for tourist products create, which will be interesting for tourists.

Step 2 - these resources define the uniqueness of the tourist service by the cluster



members provided (namely, the attraction ability, and the availability of conditions for recreation zone emergence).

Dissemination of experience of clustering of tourism sphere through the application of the complex indicator of presence or possibility of formation of the cluster (identification). The methodological approach to region cluster identification is presented in Fig. 2.3.

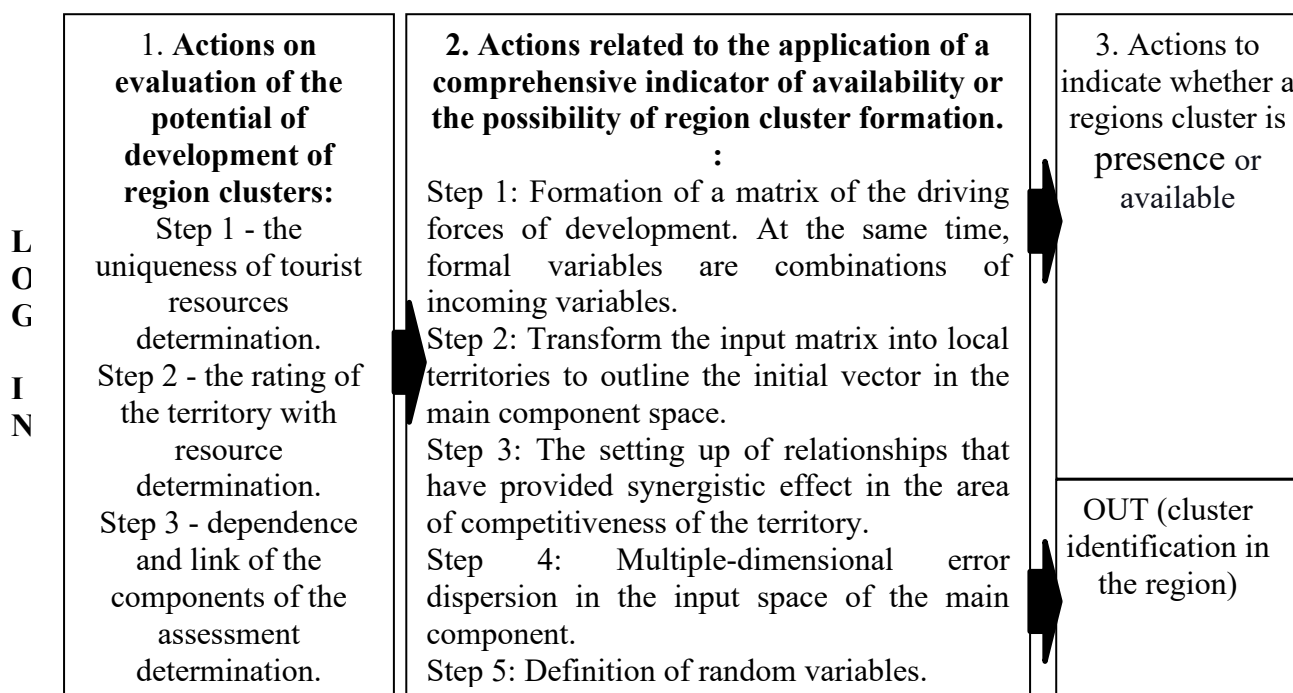


Figure 2. Methodological approach to the identification of tourism and hotel-restaurant cluster in the region.

Source: Formed on the basis of [9; 10; 11; 12]:

Methodical approach to the identification of tourism and hotel-restaurant cluster in the region must be based on:

- activities on evaluation of potential development of tourist and hotel-restaurant clusters in the regions;
- actions related to the application of a comprehensive indicator of availability or possibility of cluster formation in the region;
- actions indicate the presence or available cluster regions.

The result should be the determination of methods and principles of scientific knowledge of the cluster, which aim at solving problems of its recognition. It may be by assessing the development potential, forming a matrix of the driving forces of the



cluster development, indicating the presence or possibility of cluster formation, etc.

2.5. Activities on the evaluation of tourism and hotel-restaurant region cluster potential development

The evaluation of potential development actions of tourism and hotel-restaurant cluster in the region as a systematic aggregate of steps contain [13; 14; 15, p. 114]:

Step 1 – initial assessment of the uniqueness of tourist resources. It consists of the identification of their attractiveness to tourists. It is possible to provide based on entering the rating of each territory or region (as initial results of assessment) depending on the total volume of tourist resources (r_i) [13] (the more resources, the more attractive territory). Tourist resources form the cluster core when used to create a tourist product that will be interesting for tourists.

Step 2 - definition of the average rating of the territory by availability:

- water and balneological resources;
- forest resources; natural reserve fund resources;
- the comfort of the territory in terms of treatment and rest;
- cultural and historical resources;
- carrying capacity of infrastructure objects.

Characteristics of indicators of tourist resource volumes and their use in tourism and hotel-restaurant cluster in the region are shown in table 2.

The primary evaluation results of tourist resources are based on indicators of the volume of resources and their use. It is possible based on the average rating of the territory in the presence of water resources.

The results should be adjusted at r_b . Namely on availability of balneological resources, medical and forest resources, resources of the natural reserve fund, the comfort of territory for treatment and rest, availability of cultural and historical resources, on the carrying capacity of infrastructure objects.



Table 2 - Characteristics of indicators of tourist resources volumes and their use in tourism and hotel-restaurant cluster in the region

Indicator	Water resources (hereinafter – WR)	Forest and phototherapeutic resources (hereinafter – FPR)	Resources of the nature reserve fund (hereinafter –NRFR)	Historical and cultural resources (hereinafter – HCR)	Climate resources (hereinafter – CR)
the number of available resources	1) availability of water resources on average per 1 hectare; 2) number of wells of mineral water in operation and perspective	1) the forest, % of the total area; 2) the forest area and other forest-covered areas, a thousand hectares; 3) the forest area and forest-covered areas suitable for recreation (phototherapeutic resource)	% of the area of the natural reserve fund to the total	1) share of historical and cultural objects in their total, %; 2) number of museums, architectural monuments, archaeological and other monuments	-
the volume of use of resources, including ecological component of natural tourist resources	1) availability of water reservoirs and rivers suitable for recreation, swimming, rafting on kayaks; 2) presence of factors of pollution and increase of resource use	1) death of forest crops and forest plantations; 2) rising dynamics of logging in farms and related forestry, hectare per m ³	-	-	total comfort of the territory for treatment and rest

Source: Formed on the basis of [13; 14; 15, p. 114; 16]

Step 3: Determination of the dependence and link of the components of the assessment (based on the correlation). These dependencies must:

- indicate the relationship that may have a predictable character;
- determine how they will affect the overall potential of tourism and hotel-restaurant clusters in the regions of Ukraine.

We suggest using the interpretation of the assessment results in the XY-points diagram (the spread diagram). The diagram identifies the relationship between the quality indicators (which are the average territory rating by a specific type of resources and total) and factors (resource). The result is reflected in the parameters of the combined points in xy coordinates. The nature of the dissolving allows us to form



an equal regression and to determine the nature of the dependence and its fineness. The diagram is created by drawing experimental data in the form of composite points on the graph. At the same time:

1) the coordinates of the points correspond to the value of the quality (b) and influence factor (x) indicator;

2) the correlation relationship nature reflects the relationship between the two characteristics (quality characteristics and the factor influencing it are taken into account). The density of communication is measured by the linear coefficient of correlation;

3) the constructing the correlation fields in the form of points, it is possible to determine the multiple characters of the influence between x on u. This is important if there is a connection between two or more of the correlation signs at the same time (which can be determined by the factor of multiple correlations).

It is creating opportunities to study specific dependencies, where resource traits are factors that cause a change in the sign.

The correlation can be positive or negative.

Negative correlation defines the influence, which limits the possibility of creation of tourist product in resources.

Positive correlation defines the influence, which forms additional opportunities for the creation of tourist products [17].

2.6. Application of a comprehensive indicator of availability or possibility of tourism and hotel-restaurant region cluster formation

Activities to disseminate the experience of the cluster development of tourism in the region implemented by highlighting the complex indicator of availability or the possibility of tourism and hotel-restaurant cluster formation. Cluster identification understood to establish the unity of a wide range of participants, with cluster attributes, based on the coincidence of signs (i.e., its recognition) [18; 97, pp. 138–



140], [19; 20; 21]. To identify the cluster, we propose to adapt the approach of the Institute of Economic Research of Finland aimed at finding relationships between enterprises, buyers, and producers of products or services. The existence of such relationships testifies to:

- connection of enterprises to the chain of additional value creation;
- possibility to accumulate synergistic effect, while deepening and expanding partnership relations.

The formation of industry and intra-industry clusters also depends on other relationships with social and economic institutions, such as investment funds, and banks. Thus, several scientists suggest the allocation of current or potential clusters, based on the analysis of the driving forces of their development, to search for such relationships. Among the driving forces of development are indicators [19]: scientific, industrial, and financial forces. Within the framework of the research, it is proposed to implement the construction of the driving forces matrix of cluster development, the size of which determines a wide range of characteristics. In particular:

1) basic: inhomogeneity of the national population; the proximity of the territory to the state border; cooperation of tourist and hotel-restaurant enterprises with educational institutions; the number of profile enterprises that create tourist products, and units; the annual cost of construction of new objects for tourist industry; average cost improvement of tourist services production processes on the profile enterprise; the number of banking institutions, credit unions, investment funds providing systematic financial support to innovative projects within the branch or territory; the number of tourist products; the number of employees engaged in research work in the field;

2) add: annual average net profit per profile enterprise; domestic and foreign tourists (annual, per enterprise).

This search for relationships allows you to identify regions with better prerequisites for clustering within each driving force. On the other hand, taking into account the considerable list of characteristics of the driving forces of cluster



development, a matrix of data of significant size is formed. The basis of the approach should be to determine the direction of decrease of its size, which will ensure the loss of the smallest amount of information. We consider it expedient to use the singular decomposition of such data matrix (or Schmidt decomposition) using the method of the main component.

The principles of such singular data distribution are:

- the dissection of singular numbers, at the expense of explanatory dispersion (which in addition to the universal degree of quality of motor-driven is the universal degree of interrelation density) and error dispersion;

identification of singular numbers as characteristics of the driving forces that do not have a close connection with other driving forces represented in the data matrix;

- singular numbers are considered zero, and therefore we can disregard them.

Reducing the size of the data using the explanatory dispersion will allow identifying the density of the links between the potential participants of the cluster. This is in the language of the assessment of the dependence of the variable on the change of several independent variables x_i . It is useful for the allocation of current or potential clusters.

Taking into account that the main idea of the calculation of the main component consists in dividing the factors into "explanatory dispersion" (SSex) and "error dispersion" (SS error), the inertial effect can arise in the presence of the interrelation between scientific, industrial and financial driving forces of cluster development.

The approach to the allocation of current or potential tourism and hotel-restaurant clusters uses the allocation model of the main components. Such an approach must base on the stupefied systematic aggregate of steps:

Step 1: Formation of driving forces matrix of development or matrix X. According to matrix X (rectangular table of numerical values with dimensions I strings (samples) for J-columns (characteristics of the driving forces of development)) must be defined new formal variables ($a=1, \dots, A$), which are linear combinations of incoming variable x_i ($j=1, \dots, J$) or $t_a = p_{a1}x_1 + \dots + p_{aJ}x_J$. The matrix X can be arranged as a conditional derivative: 1) matrix of T-accounts, as an analog



of explanatory dispersion; 2) matrix of R-loads, as an analog of error dispersion.

Step 2: transform the input matrix X (with samples, which are local territories) to draw the initial vector t in the main component space and set the convergence according to the data. The remaining matrix is formed (with dimensions $I \times J$). The formal variables t_a are the main components, the number of columns t_a matrix T and p_a matrix P equal A . Parameter A defines the number of main components PC , by which there is a correlation of the characteristics of the driving forces. Value A smaller than dimensions $J \times I$. Thus, as a property of the PCA, in this case, will be the independence t_a . Therefore, the matrix T is not rebuilt when t_a , but added with an additional column. The same construction rule is valid for the R-space matrix. To build the PCA it is expedient to apply a generally accepted algorithm, which calculates one component at each calculation stage.

Step 3: Set up relationships that provide a synergistic effect in the area of competitiveness of the territory. Transformation of the input matrix (with samples, which are local territories) is carried out. To do this, the following actions are applied:

- drawing of the initial vector t in the main component space;
- the setting of intermediate values;
- set of scale according to the data and switch to another vector with the same algorithm of calculations.

Step 4: multi-dimensional error dispersion o analog designing, using the input space x_1, \dots, x_J in the main component space. In the previous steps, you should: design T space $T^T T$ (analog of explanatory dispersion); get vector projections x_1, \dots, x_i in simple p_{t_a} , taking into account t_1, \dots, t_i matrix T . Values t_1, \dots, t_i matrix T - these are the coordinates of samples in the new system, columns t_1, \dots, t matrix T are orthogonal and are the projections of relationships that provided a synergistic effect in the area of competitiveness of the industry or local area. The specificity of calculations forms a schedule of accounts in coordinates (t_i, t_j) , under which proximity in the location of two points will characterize the existence of relationships. At that, the characteristic of the importance of each component of the



model is available.

Step 5: Define accidental variables (between there are no relationships that create a synergistic effect in the area of competitiveness of the industry or territory). The chart allows you to generate a schedule of loads (to show the role of variables), provided that each variable x_j a point in coordinates (p_i, p_j) represented. This form opportunity to establish variables that are accidental (i.e., there are no interrelations between them that create a synergistic effect in the area of competitiveness of the industry or a local area).

It is expedient to use the instrument formed by the method of the main component. It is necessary to allocate valid or potential clusters in a single matrix X. The process is aimed at finding the relationships between the functioning of tourist areas and competitive advantages that provide synergistic interaction of the enterprises functioning in the environment close to the cluster with the isolated enterprise's comparison.

Conclusions

Based on the systematization of algorithms for the creation of tourist and hotel-restaurant clusters in regions of Ukraine organizational principles of its formation are defined. It is proved that these principles are aimed at the emergence of a new, progressive transition from simple to network structures, from simple to multiple characters of interactions. This task is understood as the changes identified in tourism entities' environment, which results in the transition from simple to network structures, from simple to complex interaction, as a result of the implementation of a generalized set of instructions on cluster formation. This set of steps is detailed in the following acts: determination or transformation of cluster model; formation of cluster network at horizontal level; formation of networks of cluster support; formation of the organizational structure of influence on relations of completeness and definition; achieving unity of impact on the cluster network.

Based on the systematization of algorithms for tourist and hotel-restaurant clusters creation in regions of Ukraine the methodical approach to their identification



is defined. It is proved that such an approach allows to systematically allocate methods and principles of scientific knowledge of the cluster, which are directed at solving problems of its recognition as systems (using assessment of the potential of development, formation of a matrix of the driving forces of cluster development, an indication of presence or possibility of cluster formation, etc.).



References

1. Maslyhan, O.O. and Tod'yerishko E.V. (2021), "Peculiarities of using the category of the region in addressing the packages of management influences in the sphere of tourism and recreation", *Ekonomika ta derzhava*, vol 4. pp. 78-82.
2. The EU project "Improving strategies, policies and regulation of innovations in Ukraine (2011), *Analiz zakonodavstva Ukrayiny u sferi naukovo-doslidnoyi ta innovatsiynoyi diyal'nosti ta propozytsiyi shchodo dopovnen' do zakonodavstva* [Analysis of the legislation of Ukraine in the field of research, development and innovative activities and proposals for additions to the legislation]. K.: Phoenix.
3. Artemenko, I. S. (2016), "Theoretical and methodological bases of concentration of production at enterprises of the agro-industrial complex". *Naukovi zapysky Natsional'noho universytetu «Ostroz'ka akademiya»*, vol 1(29), pp. 23–28.
4. Pys'menna, O.B, (2013), "Fundamentals of clustering of the uranium mining complex of Ukraine". *Ekonomika ta derzhava*, vol 7, pp. 83-87.
5. Porter, M. (1993), *Mezhdunarodnaya konkurentsia: konkurentnyye preimushchestva stran* [International competition: competitive advantages of countries]. M.: Mezhdunarodnyye otnosheniya.
6. Derzhavnyi komitet Ukrainy z rehuliatornoj polityky ta pidprijemnytstva (2006), *Posibnyk z klasternoho rozvytku. V ramkakh proektu YeS "Posluhy pidtrymky MSP v priorytetnykh rehionakh"* [Cluster Development Guide. Project of European Union "Small Business Support Services in priority regions"], Derzhavnyi komitet Ukrainy z rehuliatornoj polityky ta pidprijemnytstva, Kyiv, Ukraine.
7. Kyrylyuk, L.M. (2014), "Prospects for the creation of tourist clusters on the territory of Podillia", *Heopolytyka y ekoheodynamyka rehyonov*, vol. 2(13).10. pp.580-584.
8. Chykarenko, I. (2010), "Cluster approach in managing the economic development of municipal administration", *Derzhavne upravlinnya ta mistseve samovryaduvannya: zbirnyk naukovykh prats'*, vol 4(7). pp. 241-255.
9. Masligan, Ye.A. (2013), "Genesis and specifics of the cluster approach to economic management", *Ustoychivo rozvitiye, Bolgariya*, vol 6, pp. 147-154.
10. Maslygan, O.O. (2014), "The balanced system of indicators as a modern paradigm of the system description of the cluster". *Scientific Bulletin of Uzhhorod University*, vol. 2(43), pp. 247-251.
11. Tovt, S. and Maslygan, O. (2021), "The field of tourism as an object of international cooperation" *Suchasni tendentsiyi rozvytku nauky y osvity v umovakh pohlyblennya yevrointegratsiynykh protsesiv: zbirnyk tez dopovidey za materialamy VI Vseukrayins'koyi naukovo-praktychnoyi konferentsiyi* (Mukachevo, 13-14 travnya 2021 r.). Mukachevo: Vyd-vo MDU, pp. 529-531.
12. Lokhanova, N.O. (2015), "Application of the system of balanced indicators



in the system of strategic management accounting of establishments of the restaurant industry”, *Efficient economy*, vol. 11, available at: <http://www.economy.nayka.com.ua/?op=1&z=4600>.

13. Mikheyenko, N. (2018), “Council of Europe: decentralization is the most successful reform in Ukraine”, Today.ua (uk), available at: <https://today.ua/rada-yevropi-detsentralizatsiya-najuspishnisha-reforma-v-ukrayini/>

14. Nosov, O.Yu. Chernychko, T.V. (2019), Normative and legal regulation in Ukraine. *Scientific Bulletin of Mukachevo State University*, vol. 1(11), pp. 21-27.

15. Maslygan, O.O. (2020), “Evaluation of development trends in the field of recreation and tourism through the prism of the cluster approach”, *Scientific Bulletin of the Uzhhorod National University*, vol. 32. pp. 48-57.

16. Tampere region in Finland: Smart city with renewable industry, available at: www.investtampere.fi

17. Andon, P. Baxter, J. and Mahama, H. (2005), The Balanced Scorecard: Slogans, Seduction, And State of Play. *Australian Accounting Review*. Mar. Vol. 15. No.1. P.29 – 38

18. UNWTO World Tourism, available at: <http://mkt.unwto.org/baromete>

19. Ivlev, M.A. (2009), “Dynamic structural and sectoral analysis of innovation activity”, *Voprosy sovremennoy nauki i praktiki. Universitet im. V. I. Vernadskogo*, vol. 5 (19), pp. 138–140

20. The 4th International Conference on Technology Policy and Innovation (Curitiba, Brazil, August 28-31, 2000).

21. Kulagin, V.P. (2016), “Problems of parallel computing”, *Perspektivy nauki i obrazovaniya*, vol. №1, pp.7-11



CHAPTER III.

PRINCIPLES, METHODS, FORMS OF TOURIST AND HOTEL-RESTAURANT REGIONS CLUSTERS REGULATION

Introduction.

The tourist services market in Ukraine is under the conditions of transformational changes, which synthesize the increased volume of information about the domestic tourist product and require a complex vision. Therefore, for effective management of tourism and hotel and restaurant enterprises development within the clusters, its specific properties form as inseparable from the cluster's very concept in connection with their orientation to:

- routes of information routing in the networks of the cluster, which promote an integrated vision of their goals, and directions of development;
- the interaction of the market participants of tourist services in the cluster.

The object of the research is the concretization and systematic description of principles, methods, and forms of cluster regulation. The concept of regulation of development of tourist and hotel-restaurant clusters in the region includes such elements as: goal formation, organization of activity, regulation of behavior and cluster participants activity, and information exchange.

Regulation of cluster development is the management of its participants' relations oriented on:

- provision of life capacity;
- regulation of the process of achieving the goals of the cluster and its participants;
- regulation of participants' development.

The concept of tourist and hotel-restaurant region cluster development regulation with the application of routing methods uses the definition and decomposition of goals.

Ensuring the functioning and development of clusters requires:

- indicators of the operational results of the participants' activities;
- indicators of overall progress in achieving goals or a system of interrelated



indicators;

- instruments for regulating cluster development;
- systematic form of the cluster activity description.

3.1. Regulation of tourist and hotel-restaurant regions clusters development: Principles, methods, and algorithms.

The category of regulation of tourist and hotel-restaurant region clusters can consider a real influence on the relations of its participants, which encourages them to realize the set goals. This influence includes the following elements: goal formation, organizational moment, behavior adjustment (formed by the interaction between object and subject in relations regulation [1]) and cluster participants activity, information exchange. In addition, for the management of tourism and hotel-restaurant cluster development, the concept of "system" as a basic deflation is allocated, and its properties as inseparable from the cluster's very concept.

The general regulation principles of regions clusters can include [2; 3]:

- formation based on interconnected elements (each of which provides its contribution to the whole characteristic)
- purposefulness (the actions direction of internal purposes elements);
- interrelations of elements that ensure the integrity of the formation.

The allocation of such general principles of regulation of regions clusters allows asserting that all their participants are in mutual communication and interaction. Specific principle of regions cluster management needs to protect against the "domino effect". This principle aimed at preventing the chain spread of the crisis under negative factors influencing each participant.

Even a slight negative change in the performance of the same chain element (participant) causes similar changes in other elements (cluster participants) in a linear sequence. As a rule, clusters can predict the relationship between the spread of negative events and the relatively short period between them.



By the principles outlined, a systematic set of steps for regulation by the tourist and hotel-restaurant cluster focused on:

- ensuring the viability of the cluster conditioned by the view of the cluster as a system;
- regulation of the process of achieving the cluster goals; development of cluster participants (the process of goals coordination by the corporate governance body).

The author's approach to the systematized combination of tourist and hotel-restaurant regions clusters of regulation steps is present in Fig. 1.

<p>1. Ensuring the viability of the cluster: Step 1 - Testing opportunities in the functioning and development failures of the tourist and hotel-restaurant regions clusters, which have a source of shared income. Block 1 - determination of the means of testing the cluster safety status and its participants safety status. Block 2 - determination test indicators (the risk of a fluctuation of the possible economic result calculation). Step 2 – determination of safe functioning mode (the aim is to prevent the "home effect").</p>	<p>2. Regulation of the process of achieving cluster goals development: Step 1 – balance indicators selection; Step 2 - definition, decomposition, and general balancing of goals. Step 3 - infrastructure responsibility development. Step 4 - control indicators selection; Step 5 - collection of information and information analysis on results. Step 6 - balance instruments selection.</p>	<p>3. Ensuring the cluster members' development: Step 1 - planning of the participant's actions program in production will determine priority directions of development, goals, and distribution of deficit resources (the basis of the cluster goals balancing). Step 2 – planning techniques and planning methods selection. The main planning technique is integrated strategic cards and perspective plans. Step 3 - tool-time management of the cascade process based on strategic cards and the system of perspective plans.</p>
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Figure 1. Concept of regulation of tourist and hotel-restaurant region cluster development

Source: Formed on the basis of [1; 4; 5]

The test indicators form by the fluctuation of the possible result method with the game matrix drawing. Measure the possible results of the cluster and create opportunities for determining the real protection of its participants from failures. Balancing of the cluster goals is proposed to carry out on the Balanced Scorecard (BSC) basis.

According to the given approach, the regulation form of tourist and hotel-



restaurant clusters is procedural. These conclusions are based on the fact that in the above-mentioned steps the processes of ensuring the viability, goals achievement, and the qualitative state change of the cluster take a significant place.

Each process consists of a certain stage and has a cyclic character, characterized by the final result, namely the decision on adjustment.

3.2. Ensuring the viability of tourist and hotel-restaurant region clusters: principles and basic algorithms

The sphere of ensuring the viability of tourist and recreational region clusters through the formation of failures protection system is conditioned by the view of the cluster as a system. The failure protection system should be integrated with cluster members.

The failure is a short-term loss of the cluster or its elements. The short-term loss of cluster capacity in the absence of systemic actions to protect against the failures of its corporate system can be transformed into a long-term one. At the same time, the concept of working capacity is interpreted as the state of the cluster and its participants, in which they can carry out their activities at a given level of synergistic economic and technological efficiency.

The failure protection system is formed according to the following steps:

Step 1 - testing opportunities in the functioning and development failures of the tourist and hotel-orange regions clusters have a source of shared income (based on the "domino effect" indicators). Taking into account the given positions and existence of clusters networks, it is possible to describe peculiarities of testing of protection against failures, as a combination of blocks:

Block 1 - determination of the means of testing the cluster safety status and its participant's safety status. The core is oriented on the identification of the content of the failure. The failure is a short-term loss of the cluster or its elements. In case of failure the financial losses, it is impossible to perform technological operations at a



given level of return, and able to the "domino effect" start.

Block 2 - determination test indicators. The determination test indicates the possibility of the "domino effect" is based on the calculation of the risk of a possible economic result (under which the corresponding income can be realized). This is possible based on mathematical statistics methods that allow (the use of the research data) to study the probable regularities of mass phenomena.

The risk theory offers several mathematical statistics methods, which indicators determine the possibilities of the "domino effect". Among these select [5, p. 76]:

- average expected value or average weighted event value, which is associated with the uncertainty of the situation and measures the expected average result. The test indicators obtained indicate that the expected result may vary within a certain range. That is why it does not measure the extent to which a cluster can produce results from such fluctuations to protect its elements from failures. The application of such indicators doesn't create a comprehensive picture of the actions, regarding the fluctuation of the possible economic result of the participants, taking into account their mutual relations;

- the difference between the possible result and the matrix of the game (as the degree of deviation of the expected value from the average value) determined by the criterion: dispersion or average weighted of square deviations of actual results from the average expected $D(X)$; the average quadratic deviation or the root of the square from dispersion (σ); the variation coefficient or ratio of the mean deviation to the arithmetic mean shows the deviation degree of the received values from the gray (γ). The algorithm of criteria calculation is generally accepted [5, p. 76].

The following "domino effect" test indicators determine how much resources should be attracted daily for the tourist services production. As a result, the game matrix (failures protection) formed. Based on the game matrix data the calculation of fluctuations of the possible result is carried out. However, the matrix as a comprehensive test indicator allows for the allocation of possible optimal moves. It is difficult to determine whether it is appropriate for the cluster to attract resources for servicing each of these moves and which of the moves creates maximum protection



of participants from failures.

At the same time, the test indicators are formed by the fluctuation of the possible result method, with the development of the game matrix measuring the extent of the possible result for the cluster and creating opportunities to determine the protection of its participants from failures. However, it is the decision on the acceptable level of risk that should be made by the corporate sub-system-administrator, taking into account the propensity of cluster elements of risk and the degree of probability of the likely demand for tourist products. Such a game will coincide with cluster participants' interests because they not only cooperate but compete with each other. The game should be multiple.

The following categories are appropriate as test indicators:

1) the game is a scenario for the cluster participants as part of their corporate strategy. The game allows to decide how many resources it is expedient to attract to ensure the production of tourist products with the highest level of profitability and the lowest level of risk;

2) the scenario is the choice of one of the acceptable alternatives to attracting resources with the appropriate level of profitability and risk;

3) the failures protection strategy is a plan of attraction of cluster resources, according to which the bodies of corporate governance choose any possible situation, provided that it will not be able to develop the "domino effect".

It is likely that players A will win (profit) and players B will lose (as lost profit). The situation may be a reverse one.

Failure's protection testing determines the ability to implement a strategy that multiple cluster members can support. The desired result of testing is the determination of the strategy, which, in repetitions of the game, provides each cluster member with the maximum possible average gain in the "home effect" absence. The evidence of such a statement is:

1. A clean corporate strategy cluster failures protect. It is seen as a participant's game (producers and enterprises that serve them) with zero sum. In fact, the sum of the winning cluster participants will be zero if there is no risk of the "domino effect".



Provided that the goal of $A_1 \dots A_n$, players to attract as few resources as possible to produce a tourist product, the goal of $B_1 \dots B_n$ players are to sell to $A_1 \dots A_n$, participants as many resources or services as they can produce a tourist product. Under such conditions, it is assumed that the multiple players $A_1 \dots a_n$ and their service participants $B_1 \dots B_n$, choose a certain scenario of attracting resources $j=1, n$, and the choice is made with full knowledge of the choice of other participants. The result of winning the participants is $A_1 \dots A_n$ and losing $B_1 \dots B_n$, i.e., winning + losing=0. At the same time, if accept the result as $(A_1 \dots A_n \text{ and } B_1 \dots B_n) = (A_1 \dots A_n \text{ and } B_1 \dots B_n)$, that's it $(A_1 \dots A_n \text{ and } B_1 \dots B_n) = (A_1 \dots A_n \text{ and } B_1 \dots B_n)$. Then, the game matrix a_{ij} – winning players A, if they chose a strategy A_i , and winning players B if they chose a strategy B_i . At the same time, by row, we show data players A_i , and in columns, we show data players B_i [6; 5, pp. 90-120]:

$$P = [\dots a_{11} \dots a_{21} a_{22} \dots \dots \dots a_{2n} \dots] a_{1n} \dots a_{mn}, \quad (1).$$

2. A mixed corporate strategy to cluster failures protect is the game of its participants includes a near-end of the function definition. The subtotal is a mathematical concept that reflects the relationship between the elements of a cluster as a set that is stationary for it but not a maximum or minimum value. At this point (if the function of 2 variables is considered, the graph of the function, which is its geometrical expression) the surface is usually pulled in one direction and bent in another. It is necessary to find a connection between the participants' games based on "minimal strategies" which provide a win that does not exceed α , and a loss not less than β . Therefore, each cluster of multiple players is characterized by the desire to maximize the gain or decrease the loss based on the application of several strategies choice of which is casual.

In fact, in the size matrix $m \times n$, the player's strategy A_m is set by probability $X = (x_1, x_2, \dots, x_m)$, and the initial strategies are applied (in the cluster it is m-size vectors), for components that meet the conditions: $\sum_{i=1}^m x_i = 1$, if $x \geq 0, i = 1, \dots, m$. Similar to players B_n (as n-size vectors), set by probability $Y = (y_1, y_2, \dots, y_m)$. So, the mixed strategy of the player A there is a clear strategy A_1, A_2, \dots, A_n , which a probably x_1, x_2, \dots, x_m , moreover $\sum_{i=1}^i x_i = 1$ (similarly for



Б $\sum_n^i y_i = 1$), what is interpreted by mathematical expression in multiple spaces $A_m \times B_n$ [5; 7]:

$$[A_1 A_2, \dots, x_1 x_2, \dots, A_m x_m] \text{ or } \underline{X} = (x_1, x_2, \dots, x_m), \quad (2.)$$

$$[B_1 B_2, \dots, y_1 y_2, \dots, B_n y_n] \text{ or } \underline{Y} = (y_1, y_2, \dots, y_n), \quad (3)$$

Based on the defined interpretation the failure protection is achieved only in cases of mixed minimal moves (which is a single vector). The testing results should highlight these cases.

Step 2 – determination of safe functioning and making a decision to prevent the spread of the “domino effects”. The term failures protect system is used to classify information products that contain a dot in the identity of the server’s security state.

Safe operation is the optimal strategy for all cluster territorial associations and cluster members to failures protect identified by the winning features $f(\underline{X}, \underline{Y})$ of the matrix $\Pi = \|\|a_{ij}\|$. Thus, when a player A_m uses a mixed strategy \underline{X} and a player B_n a mixed strategy \underline{Y} , the winning player A (lose the player B), determined according to the algorithm [6; 8, pp. 90-120; 9]:

$$f(\underline{X}, \underline{Y}) = \sum_i^n x_i \times y_i \times a_{ij} = \underline{X} \Pi \underline{Y}, \quad (4);$$

Under these conditions, strategies of multiple players can take the form of optimal $X^o Y^o$ (such that will provide player A average win, no less than in the case of any other X and player B – the average loss is no more than in the case of any Y). This is possible if the players' actions satisfy the conditions [6; 8, p. 90-120]:

$$f(\underline{X}, \underline{Y}^o) \leq f(\underline{X}^o, \underline{Y}^o) \leq f(\underline{X}^o, \underline{Y}), \quad (5)$$

The combination of multiple $(\underline{X}^o, \underline{Y}^o)$ is a safe mode of operation of the cluster according to the payment matrixes values and their price ($v = f(\underline{X}^o, \underline{Y}^o)$) corresponds to decision on attraction of resources for tourist product production on corresponding profitability and minimal risk level of occurrence of "domino effect".

Cluster's viability ensuring game theory use should contain end game of full length $(m \times n)$ players A_m and B_n in cluster C and connection that can be a clean or mixed strategy $f(\underline{X}^o, \underline{Y}^o)$ the application of which allows getting a win, that for the price of the game $\alpha \leq v \leq \beta$ minimizes the risk of a "domino effect".



For the optimal cluster failures protection strategy, the ratio has been kept $\max_y \min_x XAY = \max_y \min_x XAY$ [7-8]. It realized in the framework of the unbeaten ratio [6; 8, pp. 90-120; 9]:

$$\sum_{i=1}^m a_{ij}x_i \geq v, i = 1, \dots, n \text{ and } \sum_{i=1}^n a_{ij}y_i \geq v, \quad i = 1, \dots, m, \quad (6)$$

That is, the use of strategy \underline{Y}^0 by the players A 1, A2..., Am should provide them win equal to v or lose, which does not exceed v . This should be done in any way by the players A 1, A2, ..., Am and *players* B 1, B2, ..., Bn. And vice versa.

However, to avoid the "domino effect", the variation ratio value should also be taken into account. Income fluctuations are weak if $\gamma < 10\%$, if γ is from 11-25% it is average. Income fluctuations are significant if $\gamma > 25-40\%$ and critical if $\gamma > 41\%$ [10].

To calculate the possible result of fluctuation advisable to create a game matrix for the region cluster and each cluster member. It is done to research the games of the given matrices and to find the optimal strategy at minimal variation [10, pp. 156-200]. It is relevant for mountainous and remote settlements. For each player tourist and hotel-restaurant cluster it is expedient to assemble the matrix in the following form (table 1).

At the same time: (1) X - average value of the indicator; (2) probability of Pi; (3) V - average costs; (4) average cost.

We consider that expedient to draw up a restated matrix game in terms of seasons of tourist activity determined by the specificity of visiting tourist areas at the time of year. It is formed by the specificity of local natural-climatic conditions and resources, the threshold of year, and other factors. According to this specificity, there is a possibility to allocate:

(1) a single-season specificity spread in the clusters that tourists visit at a certain time of year, mainly in summer or winter;

2) two-season specificity spread in the clusters which tourists visit in summer and winter;

3) multi-season spread in the clusters that visitors visit constantly (during the year), although there are seasonal fluctuations of tourist flows.



Table 1 - Form of game matrix for players Am and Bn of tourist and hotel-restaurant cluster

Game strategies	Profit options, thousand UAH.				\bar{X}	Average profit value, thousand UAH.				Possible result fluctuations			
	A** (x1)	B (x2)	D (x3)	E (x4)		E	D	B	A	(q)6	D(x)	σ	γ
AA, AB, AD, AE	$X_{a1} = (x1 * p) - (x1 * v)$	0	0	0	$\frac{\sum_{i=1}^n X_i}{4}$	$Me1 = X_{e1} \times P_i$ x1	$M_{d1} = X_{d1} \times P_i$ x1	$M_{b1} = X_{b1} \times P_i$ x1	$M_{a1} = X_{a1} \times P_i$ x1	A	$\sum_{i=1}^n p_i (x_i - \sigma = \sqrt{D}(y = \sigma/A))$		
BA, BB, BD, BE	$X_{b1} = (x1 * p) - (x2 * v)$	$X_{b2} = (x2 * p) - (x2 * v)$	0	0	$\frac{\sum_{i=1}^n X_i}{2}$	$Me2 = X_{e2} \times P_i$ x2	$Me2 = X_{e2} \times P_i$ x2	$M_{b1} = X_{b2} \times P_i$ x2	...	B	$\sum_{i=1}^n p_i (x_i - \sigma = \sqrt{D}(y = \sigma/A))$		
DA, DB, DD, DE	$X_{d1} = (x1 * p) - (x3 * v)$	$X_{d2} = (x2 * p) - (x3 * v)$	$X_{d3} = (x3 * p) - (x3 * v)$	0	$\frac{\sum_{i=1}^n X_i}{3}$	$Me3 = X_{e3} \times P_i$ x3	$Me3 = X_{e3} \times P_i$ x3	$M_{b1} = X_{b3} \times P_i$ x3	...	D	$\sum_{i=1}^n p_i (x_i - \sigma = \sqrt{D}(y = \sigma/A))$		
EA, EB, ED, EE	$X_{e1} = (x1 * p) - (x4 * v)$	$X_{e2} = (x2 * p) - (x4 * v)$	$X_{e3} = (x3 * p) - (x4 * v)$	$X_{e4} = (x4 * p) - (x4 * v)$	$\frac{\sum_{i=1}^n X_i}{4}$	$Me4 = X_{e4} \times P_i$ x4	$Me3 = X_{e3} \times P_i$ x4	$M_{b1} = X_{b4} \times P_i$ x4	...	E	$\sum_{i=1}^n p_i (x_i - \sigma = \sqrt{D}(y = \sigma/A))$		
\bar{X}^1	$\frac{\sum_{i=1}^n X_i}{4}$	$\frac{\sum_{i=1}^n X_i}{3}$	$\frac{\sum_{i=1}^n X_i}{2}$	$\frac{\sum_{i=1}^n X_i}{4}$	$\frac{\sum_{i=1}^n X_i}{4}$	$\frac{\sum_{i=1}^n Me_i}{4}$	$\frac{\sum_{i=1}^n M_{d_i}}{4}$	$\frac{\sum_{i=1}^n M_{b_i}}{4}$	$\frac{\sum_{i=1}^n M_{a_i}}{4}$	-	-	-	-

optimal moves

Source: formed by the author.

When forming the game matrix in the first two cases, it is necessary to allocate the following game situations of tourist activity [11]:

- peak season with maximum tourists' number and the most favorable conditions for providing tourist services or production of tourist products;
- high season, which is considered the period of the highest business activity of the cluster participants (it is the time of the maximum tariffs for tourist products);
- low season, characterized by a decrease in business activity of the cluster participants (in this season tourist products prices are lowest);
- "dead" season or period, not favorable for organization of recreational activity in the cluster, in connection with practical tourists' absence (for example, because of uncomfortable weather conditions).



3.3. Regulation of tourism and hotel-restaurant cluster development: Basic algorithms

The tourism and hotel-restaurant cluster regulation development system are carried out for purposes. The basic in the aggregate steps to achieve the cluster goals is the impact on the development of enterprises within the cluster. Such development regulation uses the following methods:

- balancing goals. It is a procedure to reduce to an acceptable level the goals imbalance in the cluster to ensure their balance and goals management;
- determination of goals. It is a determining goals procedure for the cluster and cluster participants;
- decomposition of goals. It is goals structuring and a goals tree construction procedures according to the hierarchical principle.

According to the methodical specificity such regulation of tourist and hotel-restaurant clusters requires defense:

- balance indicators;
- balance instruments.

Step 1 –balance indicators select. These indicators are related to the operational results of the participants' activities and overall progress in achieving goals or Balanced Scorecard. Balancing is a complex procedure aims to form a systematic form of a description of the cluster's activity and its participants. The procedure result characterizes the aimed of strategy and mission drawing and decomposition of the main goals of the cluster and cluster participants.

Thus, there is a need in methods of a wide range of actions for system description of activity with application of different complexes of instruments. Within the methods of development management of tourist and hotel-restaurant clusters can apply the key indicators systems of activity. There are a large number of such models. Namely: Balanced Scorecard, "Indicator board", "Performance Pyramid", Hewlett-Packard. The characteristics of the system description of cluster activity models are shown in table 2. From the models presented, only a balanced system is



universal and can be adapted for the system description of cluster activity.

Table 2 - Description of models of system description of tourist and hotel-restaurant cluster activity

Models	The basic position model	Especially stuck in cluster
Balanced Scorecard (D. Norton ta R. Kaplan, 1992)	provides a systematic description of the cluster and its participants through the prism of the strategy and optimally selected indicators system.	it is implemented in a cluster by the top-down method. Separate systems are developed for the cluster, the member, its departments, and employees, which contain the best-selected indicators
Indicator board, (France, 1932)	provides a systematic description of cluster activity and its participants through the prism of activity results measurement indicators.	it is difficult to introduce into a cluster at the lower levels of hierarchy since only systematization of activity indicators, and its participants without any cause-effect relations are available. It makes it difficult to balance goals.
Performance Pyramid (R. Lynch, C. Cross and Mc Nair, 1990)	provides a systematic description of the cluster's activity and its participants through sets of indicators systematized in terms of the perspectives — market, finance, clients and satisfaction of their needs, innovations, and training, production of services or goods, quality, realization period, production cycle, losses due to low quality	it is difficult to implement into a cluster. It is because linking the cluster's strategy with its participants' strategies, based on operational performance indicators (at the lowest operational levels), makes it difficult to balance goals.
Hewlett-Packard, (Hewlett-Packard, 1990)	provides a systematic description of the cluster and its participants' activities by outlining the participants' processes using process change parameters. The parameters of process change are measured from a cost point of view; level of quality of services; level of growth of labor production;	it is difficult to implement into a cluster. It is because cluster results evaluation is based on the provisions concerning the development of its participants (considered as internal clients). The costs and quality of the services provided are agreed upon between the cluster and its member.

Source: [12, pp. 4-10; 13; 14; 15]

We consider the appropriate use of the Balanced Scorecard as a method of a wide range of action. The defined methods are the basis of balancing, which ensures the integration of financial and non-financial indicators taking into account the causal relationships between the results and the factors under the influence of which they are formed. The complex Balanced Scorecard consists in the separation of processes of development of environment and maintenance of integrity, among other changes and launching mechanisms of cyclic reproduction of the constant system of functions of



production of processes of effective development based on remote processing of large data sets. It is connected with peculiarities of regulation of development of tourist and hotel-restaurant clusters. There is a cluster administrative subsystem; administrative subsystems of participants. It is necessary to regulate the integration of cluster development efforts and effective cluster formation and development paradigm, links break down and cluster disappears [12, pp. 4-10; 13; 14; 15]. The process of achieving cluster development goals includes:

- (1) a higher-level model that forms the process of achieving cluster goals;
- (2) a model for regulating the development of cluster participants that forms the process of goal coordination on the part of the corporate governance body.

The set of steps is based on the methods of balancing, defining, and decomposition of goals.

Steps to balance the goals of tourist and hotel-restaurant clusters on the Balanced Scorecard for the management of the participant's relations are shown in Fig. 2. The goals of the cluster members are quite different. Business entities, are to maximize personal profit. For educational and scientific institutions, they consist in forming values necessary for the successful realization of the competence of citizens, ability to provide independence, initiative, and systematic activity for the achievement of their economic and social interests. For local self-government bodies, it is the solution to problems of social and economic development of territorial communities. Transformational changes envisage the allocation of the integral development strategy component as the primary balance sheet basis (level 1).

Implementation of the goal balance sheet basis is conditioned by the need to define common development priorities. The strategies of cluster integration development supported by the participants strategies. The first hierarchical level of balance contributes to the determination and decomposition of the objectives of the cluster in components: external environment; development and training of cluster participants; cluster target clients; failures protection.

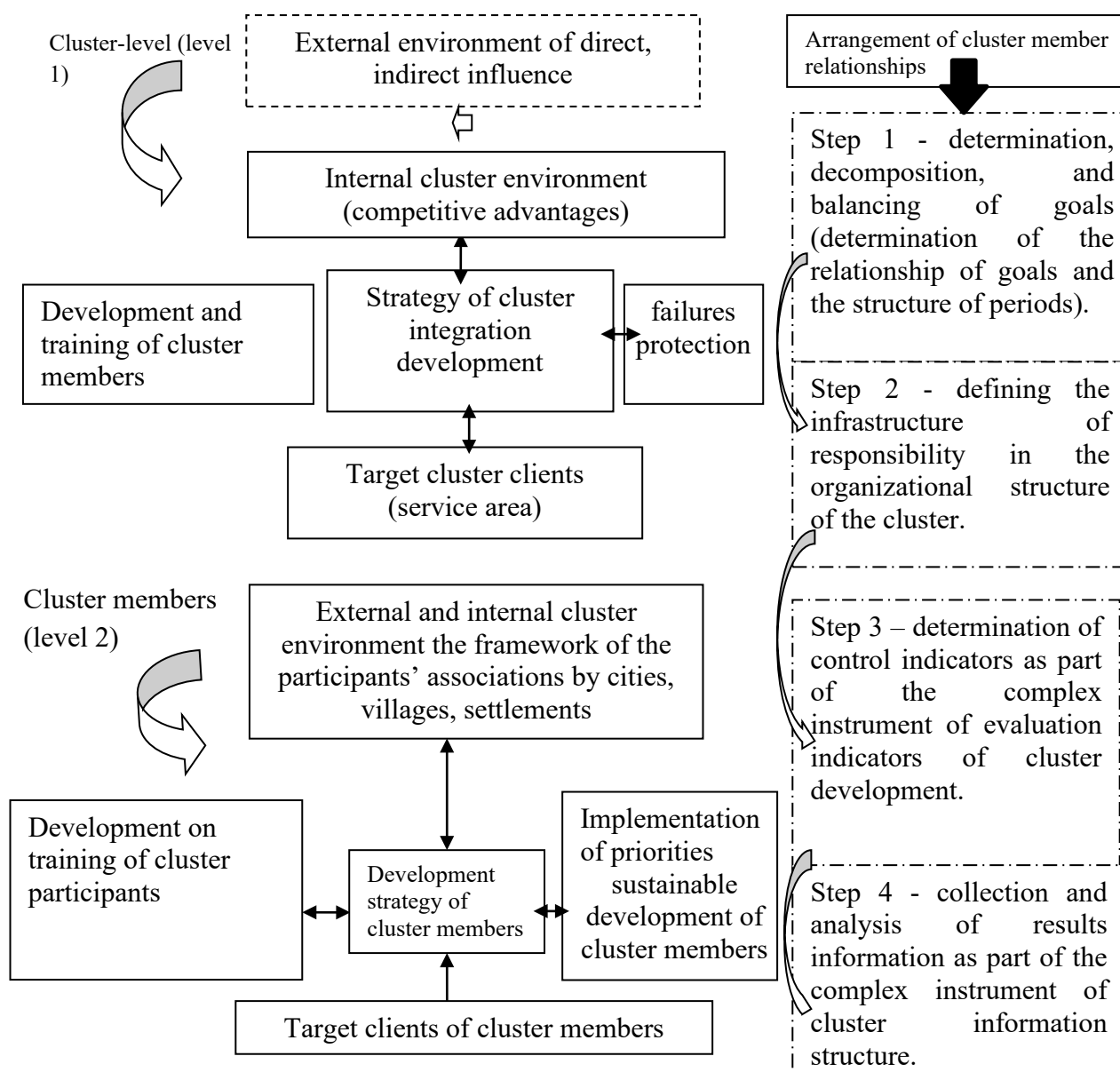


Figure 2. Steps to balance the goals of tourist and hotel-restaurant clusters on the Balanced Scorecard for the management of the participant's relations

Source: formed by the author.

Cluster-level (Level 1) failure protection actions are effective only with an adequate set of methodological algorithms to ensure the stable functioning of the cluster. It is because the possibility of implementing the strategy of integration development of cluster members depends on the opportunities for sustainable functioning in the cluster environment. It is expedient to allocate the component "Strategy of development of a member of a cluster and territorial association of



participants" as the basis of the balance.

The second hierarchical level of balance contributes to the determination and decomposition of the goals of the cluster participants in the fillers:

- internal and external environment;
- development of the employees of the cluster participants or their separate associations;
- target clients of cluster participants and their associations;
- sustainable development of cluster members.

Steps 2-5 - balance the goals of the cluster participants and goals management. According to the scheme the systematic aggregate of the steps of the goals in the cluster contains quite specific:

Step 2 - definition, decomposition, and general balancing of goals (using the tools "Goals-means" and "Goals-criteria", correlation of significant factors and the structure of time intervals [16]).

Step 3 - infrastructure responsibility development (based on the complex instrument of the executive organizational structure).

Step 4 - control indicators selection on the basis of an integrated evaluation tool;

Step 5 - collection of information and information analysis on results (as part of the complex instrument of information structure).

Step 6 - balance instruments selection.

Among the instruments of the balance of goals of the cluster based on the Balanced Scorecard allocated [17; 18]:

1) "objectives-means" (strategic card; complex of measures; cause-effect relations);

2) "objectives — criteria" (instruments of cascading); organizational structure of the cluster and its participants (job instructions; provisions on organizational units);

3) systems of evaluation indicators (systems of participants activity and indicators of cluster activity);

4) information structure (information flows, databases, data on cluster activity and its participants in historical aspect, documents, information technologies).



The complex application of the specified tools forms the capabilities of the system description of the cluster (Table 3).

Table 3 - The elements of realization of a systematic combination of steps to balance region cluster goals based on a Balanced Scorecard

The elements	Complex instruments	The combination of steps to balance goals	Algorithm of actions
Definition, decomposition of balance of goals	goals-means	description of the main causal relationships between its elements	visualization of the strategy
	complex of measures	description of organizational directions and types of activity of the cluster and its participants	regulation
	cause-effect relations	description of problems of cluster activity, its participants, and ways of overcoming them	analytical screen (analysis)
	goals-criteria	systematic description of cluster activity at all organizational levels (based on development and transfer of the Balanced Scorecard)	cascade at all hierarchical levels
	benchmarking	description of process parameters, costs, results of cluster operation, and its participants	comparison with other clusters
	significant factors relationships	description of cluster activity and its participants, based on indicators	graphical description
	the structure of periods	description of cluster activity and its participants in time	planning
infrastructure of responsibility and influence transfer	delegation of authority	delegation of powers of cluster participants, formation of hierarchical and functional organizational structures of cluster regulation and participants	regulation
Cascade systems of indicators	regulatory systems	the aggregate of the system of regulations	regulatory
collection and analysis of information on results	development alternatives choice	collection and processing of data concerning the activity of cluster participants (database)	automation of gathering, processing of information

Source: formed on the basis of [17; 18].

Among the steps to goals balance of the tourist and hotel-restaurant cluster in the Balanced Scorecard region:

- visualization or construction of the graphical image of strategy; regulation (setting of rules of cluster activity and its participants);
- analytical analysis (but the basis of several modern modifications of key



performance indicators);

- cascading (translation of cluster goals in its structure);
- analytical screen (analysis by Balanced Scorecard components);
- comparison with similar data of other similar entities;
- graphical description outlines the impact of the change of the initial indicator

on the achievement of the overall goal of the cluster's existence;

- planning (for which important preliminary outline of the planned periods of strategy implementation);

- regulatory (the activity of development and approval of norms and rules for obligatory application in a cluster, for participants in the form of financial and non-financial indicators);

- automation of gathering and processing of information and its flows.

3.4. The goals coordination process of the participants of tourist and hotel-restaurant cluster use the subsystem-administrator: basic algorithms and methods

The scope of regulation of the development of tourist and hotel-restaurant cluster participants in the regions can be defined as a step-by-step process of goal coordination by the sub-system-administrator of the cluster.

Step 1 - action program planning, which sets development priorities and main goals (internal and external), as well as the allocation of scarce resources for all cluster members [19]. The contents of the program formed by an algorithm: (1) Plan - initial – penetration - hasty growth -slow height; (2) necessity of restructuring-development of ways of restructuring-height; (3) revision of charges- selection of stabilizing ways (-achievement of stabilizing; (4) necessity of reduction or liquidation - ways of reduction - duction or liquidation

Step 2 – techniques and methods of planning selection. The main methods of planning are to form integrated strategic cards (for the number and the maximum



amount of integration of the participants' development efforts should be determined). In clusters, such documents help participants use the opportunities available in external and internal environments. The main planning technique is goals cascade in the tool-time cut (based on long-term plans, projects, and cluster-level programs over time). It is the instrumental component that is transformed by the Balanced Scorecard application. The transformer effect provides the cascading tools necessary for the perspective plans implementation and their transmission on cluster network elements (based on tactical and operational plans).

Step 3 - the decision of the action program implementation, its instrumental and time-cutting, a cascade based on strategic cards, and a system of perspective plans. An innovative and time-based cascade based on a system of perspective plans forms an opportunity to provide (with perspective plans) flexible network coordination of integrated cluster development directions, self-managed profile or cross-group groups, and individual cluster members, taking into account:

- 1) needs of target clients of the cluster and integrated needs of its participants in the training, development, protection from failures, use of success factors;
- 2) available resources of the cluster, taking into account internal support, from banking institutions, credit unions, investment funds.

Balanced Scorecard introduction limits perspective planning methods. Long-term plans based on extrapolation, namely, the use of the results of the previous periods, based on the resolution of optimistic goals and the formation of mutually related generalized target indicators on several higher indicators unacceptable for the future period [20, pp. 295-311]. It is because the basis for a decision on the implementation of the action program can no longer be only optimistic expectations, a comprehensive scientific substantiation of the problems that can arise in the planned direction of integration development of the participants of the tourist and recreational cluster is needed.

It is expedient to cascade the Balanced Scorecard within the framework of strategic plans, and goals are set out in the strategic map and implemented in the differentiated (according to the subdivisions of the cluster participants) documentary



complexes containing:

1) flexible strategic programs of action, and flexible current budgets, which form the basis for ensuring stable functioning in the cluster. These action programs require an integrated execution system;

2) profit plans that target individual participants to a specific profitable work algorithm that can ensure a stable operation in the cluster.

The acceptance of translation of the contents of perspective plans into more differentiated budgets or plans actualizes the importance of studying the instrumental-time cutting of cascading in this area. Such a cut allows reaching the completion of the cascade process. Besides the tool-time cutting cascade additionally forms:

1) functional, which outlines at all levels directions and rates of development of functional sub-systems of cluster participants;

2) resource, which defines urgent needs and opportunities of providing resources to the executors of strategic actions;

3) executive, which indicates the range of strategic actions involved. This allows for forming an address system of responsibility for results.

Conclusions.

Regulation of integrated efforts of development of tourist and hotel-restaurant cluster participants provides the initial formal description the description, explanatory and predictive functions perform the strategic analysis. The result is a description necessary for starting cyclic reproduction mechanisms of a constant system of functions in the production of processes of effective development. These techniques and methods are based on the substantiation of the planned indicators and help to identify development directions within the framework of the different strategies of integration cluster development.

Regulation of the tourist and hotel-restaurant cluster is expedient by way of long-term strategic planning, translation of goals and tasks of activity in a two-level balanced Scorecard realizes the concept of development by goals regulation. It is the



most acceptable since the activity of the participants is multi-valued, regulation on the purposes oriented on the achievement of the whole set of cluster participants' goals. The sub-system-administrator of the region cluster (the Council of the cluster represented by business entities and representatives of local authorities and United territorial communities) defines the purpose of its activity.

Participants form secondary goals of the activity, outlining the mechanisms of their realization, as well as the timing and state of intermediate parameters of processes for cyclic reproduction of development functions at the purposes.



References

1. Muzychenko, A.S. and Berzhanir, A.L. (2013), “Models of interaction between government and business in the conditions of a market economy”, *Stalyy rozvytok ekonomiky*, vol. 4(21), pp. 24-28.
2. Rohlyev, K.H.Y. (2005), *Osnovy hotel'noho menedzhmenta* [Basics of hotel management], Kyiv: Condor.
3. Slavich, O.D. and Slavych, E.D. (2018), “Life cycle models of enterprise development”, *Mizhnarodnyy naukovyy zhurnal Internauka*, vol.14, pp. 40-45.
4. Borysoglebskaya, L.N., Maltseva, A.A. and Glebova, I.Z. (2011), “The formation of innovation clusters based on the classification of technology parks to ensure the competitiveness of the region's development”, *Regional'naya ekonomika: teoriya i praktika*, vol. 1(184), pp. 14-20.
5. Donets', L.I. (2004), *Ekonomichni ryzyky ta metody yikh vymiryuvannya* [Economic risks and methods of their measurement], Donetsk, DonDUET..
6. Fuegi, J. and Francis, J. (2003), Lovelace & Babbage and the creation of the 1843 'notes. *Annals of the History of Computing*, vol. 25(4)
7. Apatova, N.V. and Goncharova, O.N. (2001), “Territorial and sectoral models of the recreational complex of Big Yalta”, *Kul'tura narodov Prichernomor'ya*, vol. 25, pp.12-15.
8. Vittorio Chiesa & Davide Chiaroni. *Industrial Clusters in Biotechnology: Driving Forces, Development Processes and Management Practices*. World Scientific Publishing Co. Pte. Ltd., p.360.
9. Maslygan, O.O. (2016), “Strategies of integrative development of cluster participants”, *Ekonomika, nauka, osvita: intehratsiya ta synerhiya: materialy mizhnarodnoyi naukovo-praktychnoyi konferentsiyi* (Bratyslava, 18-21 sichnya 2016 r.), K.: Vyd.- vo. «Tsentri navchal'noyi literatury», S. 12-13.
10. Vitlins'kyi, V.V. and Velykoivanenko, H.I. (2004), *Ryzykolohiya v ekonomitsi ta pidpryyemnytstvi: monohrafiya* [Riskology in economics and entrepreneurship]. Kyiv: KNEU.
11. Stoyanets, N.V. (2015), “Creation of a typical regional forecasting system modeling program”, *Teoretychni ta prykladni pytannya ekonomiky*, vol. 1, pp. 314-325.
12. Kaplan, R.S. and Norton, D.P. (2006), *Sbalansirovannaya sistema pokazateley. Ot strategii k deystviyu* [Balanced scorecard. From strategy to action]. 2nd ed., rev. and additional M.: CJSC "OlympBusines.
13. Kyzym M.O., Pylypenko A.A., Zinchenko V.A. (2007), *Zbalansovana sistema pokaznykiv* [A balanced system of indicators]. Kharkiv: INZHEK.
14. Nili E., Adams K. , Kennerli M. (2003), *Prizma effektivnosti: Karta sbalansirovannykh pokazateley dlya izmereniya uspekha v biznese i upravleniye im*



[Performance Prism: Balanced Scorecard for measuring and managing business success]. Dnepropetrovsk: Balance Club.

15. Potapchuk N. Cluster of transcordon rural tourism "Dnipro" presented in Kiev, available at: http://www.ukrinform.ua/ukr/news/download/klaster_transkordonnogo_slskogo_turizmu_dnpro_prezentovano_u_kiv_961329

16. Boschma, R. (2016). Relatedness as driver of regional diversification: a research agenda. *Regional Studies*, pp. 1-14.

17. Ittner, C.D. and Larcker, D.F. (2003), Coming up short on nonfinancial performance measurement. *Harvard Business Review*, pp. 88 – 95.

18. Kaplan, R.S. and Norton, D.P. (1996), *The balanced scorecard: translating strategy into action*. Harvard Business School Press, Boston.

19. Mikityuk, N.O. (2010), “Peculiarities of using a system approach in the formation and management of clusters”, *Problems of economics and management. Bulletin of Lviv Polytechnic University*, vol. 683, pp. 112-117.

20. Markuzen, A. (1996), Sticky Places in Slippery Space: A Typology of Industrial Districts. *Economic Geography*, vol.72(3), pp. 293-313.



CHAPTER IV.

CYCLE OF REGULATION OF TOURIST AND HOTEL-RESTAURANT CLUSTERS BASED ON A BALANCED SCORECARD

Introduction.

A Balanced Scorecard can use for the regulation cycle formation of tourist and hotel-restaurant regions cluster based on objective decisions and ideas about directions of integration development and participants development. Such a cycle should provide a basis for the directions of integration development and cluster participants development [1]. It is possible because the regulation cycle contains:

- the object of reactions to the state of macro- and micro-environments;
- change of advantages and limitations of future integration development; strategic directions of action;
- to object changes in the course of cluster adjustment according to its diagnostic portrait;
- to coordinate the integration development prospects of the cluster by the Balanced Scorecard components.

Within the framework of tourist and recreational clusters, there is a multi-business environment, therefore strategic analysis is an integrated multilevel transformation of databases formed as a result of analysis of the external (macro-) and internal microenvironment and internal environment of its participants (microanalysis) according to the Balanced Scorecard structure. This analysis is the basis for a strategic card drawing up in the identification of success factors area.

4.1. Description of strategic analysis methods of tourist and hotel-restaurant clusters activity

Characteristics of methods of strategic analysis of tourist and hotel-restaurant cluster activity reveal their inability to take into account all parameters of activity, macro- and microenvironment, which are necessary for identification of advantages and limitations of future integration development (Table 1).



Table 1- Characteristics of methods of strategic analysis of tourist and hotel-restaurant cluster activity

Methods	Essence of methods	Disadvantages	Advantages
1	2	3	4
The strategic analysis methods of the cluster environment.			
SWOT-analysis	The external environment evaluation of cluster functioning consists in dividing factors and phenomena into four categories: Strengths; Weaknesses, Opportunities, Threats (related to area of activity)	The methods are a descriptive description, in fact, only ensures the definition of the overall goals or not specific measures for their achievement in this connection they developed separately	Allows detailed study of the external and internal environment. The result of the analysis is effective decisions regarding the design of the reaction of the cluster participants according to the signals of the external environment
SNW-analysis	Enterprise sides method of analysis. The name of this method arises from the reduction of the first letters of the English words S - strong side, N -neutral side, and W - weak side. Use for internal environment deep study.		«...» Allows to analyze strong and weak sides of the cluster and its competitive advantages to determine
PEST-analysis (STEP)	Identification of political, economic, social, and technological aspects of the cluster's environment. The analysis is use according to the scheme "factor-enterprise".	It doesn't allow to determine the competitive advantage of the cluster and the state of the cluster environment on activity.	<i>It quite simple to use</i>
PESTplus-analysis (STEP plus)	PESTLE analysis is the addition of macro factors by legal and environmental groups; STEEPLE analysis is the addition of macro factors to ethnical and geographical groups.		«...»
Competitive forces analysis uses Porter's five-force model	The method of analysis of industry and business strategy development is based on Porter's five forces assessment, namely: analysis of new players' threats; analysis of the market power of suppliers; analysis of the market power of consumers.	Within the strategic analysis framework, a detailed study of the cluster environment doesn't provide an analysis of the competitive forces is required with the help of "Porter's five-force model".	The method determines the level of competition and the attractiveness of doing business in a specific industry.
SPACE-analysis	The analysis uses activity evaluation criteria. Namely: financial strength, competitiveness,	It doesn't allow for analyzing the strong and weak sides of the cluster.	Allows to outline the cluster participant's market positions and form optimal strategies of action (mainly



Continuation of the table 1

1	2	3	4
	market position; attractiveness of the branch in which it operates; the industry's stability. The results in a rectangular coordinate system are summarized in which each axis X and Y represents a group of criteria. The vector of the recommended strategy is considered aggressive, conservative, protective, competitive	The cluster implements an integrated development strategy for cluster members corresponding to the matrix of integrated development strategies. The directions of integration growth of its participants taken into account is not possible according to SPACE analysis	if there are small and medium participants in it).
Methods of strategic analysis of the internal environment of cluster participants			
SNW-analysis	«...»	«...»	The method can be optimized using a two-factor position matrix with SNW values. It helps to outline the strategic positions of the cluster member, taking into account the innovative orientation and possibilities of integration cooperation
The growth-share approach of the BCG	It reflects the positions of a particular kind of participant business in the strategic space by two coordination axes defined. One axis uses to measure the growth rate of the tourist product market. The other axis use measurement of production share of the enterprise's product on the market cluster boundaries limited.	The attention focuses on cluster member cash flows or operations cash flows. The income level of participants and spending of funds depends on the growth rate of the market and the cluster member market share. Decisions on the strategy by the SLC “growth-share” model determined without the specific development of the cluster	Allows to define strategic positions of cluster members in terms of their business activities and to provide recommendations on the strategic balance of the money. At the same time, innovation and cooperation are the main in clusters.
GE McKinsey method	It reflects the cluster members' business position in the strategic space matrix. At the same time, axes B and X present integral space that estimates the market attractiveness and participant market advantages.	Action strategy decisions use the GE McKinsey model without integrated management cluster specifics. There is an opportunity to distinguish the specifics	Each McKinney define as a multi-factor dimension makes it realistic in positioning the types of the business of cluster members.



Continuation of the table 1

1	2	3	4
		activity in axes: the sphere of the leader; the sphere of loss; the sphere of stable generation of profit	
Shell model	The two-factor analysis uses multiple estimates of quantitative and qualitative cluster member business parameters.	The model for optimal strategic decisions focuses on indicators of cash flows and investment return without regard to the specific management of the cluster.	Can assess the types of business activity of participants at different stages of the life cycle

Source: formed on the basis of [1; 2; 3; 4; 5; 6])

For the strategic analysis, we use the undeveloped algorithms of strong, neutral, and weak organization sides analysis identification the average within the territory of the state of advantages and limitations of the future integration development. In this shell, integrated sets of indicators with the internal core of a Balanced Scorecard provide the initial formal description of the cluster, determine the goals imbalance level, and initiate processes of reducing the imbalance of acceptable level.

In practice, this will form an integral basis for regulation of cluster development processes and mechanisms launching cyclic reproduction of the permanent system of functions for the production of processes of effective region development.

Directions of the formal cluster description in the shell of the analysis of strong, neutral, and weak sides include:

- 1) cluster environment assessment;
- 2) cluster internal environment assessments use the components of a Balanced

Scorecard:

- training and development;
- ensuring stable functioning in the cluster;
- target clients.

The component defense against shell failures unintegrated into the claim that the elements of the game theory are:



- mathematical models set of optimal decision making in the conditions of uncertainty or conflict of parties;

- mathematical models set of forecasting the variation of possible economic results according to different scenarios of cluster operation and cluster member associations within cities, villages, and settlements.

The basis of regulatory actions will be a general portrait of the cluster.

The adjustment cycle steps of tourist and hotel-restaurant clusters based on Balanced Scorecard implementation represent in Fig. 1.

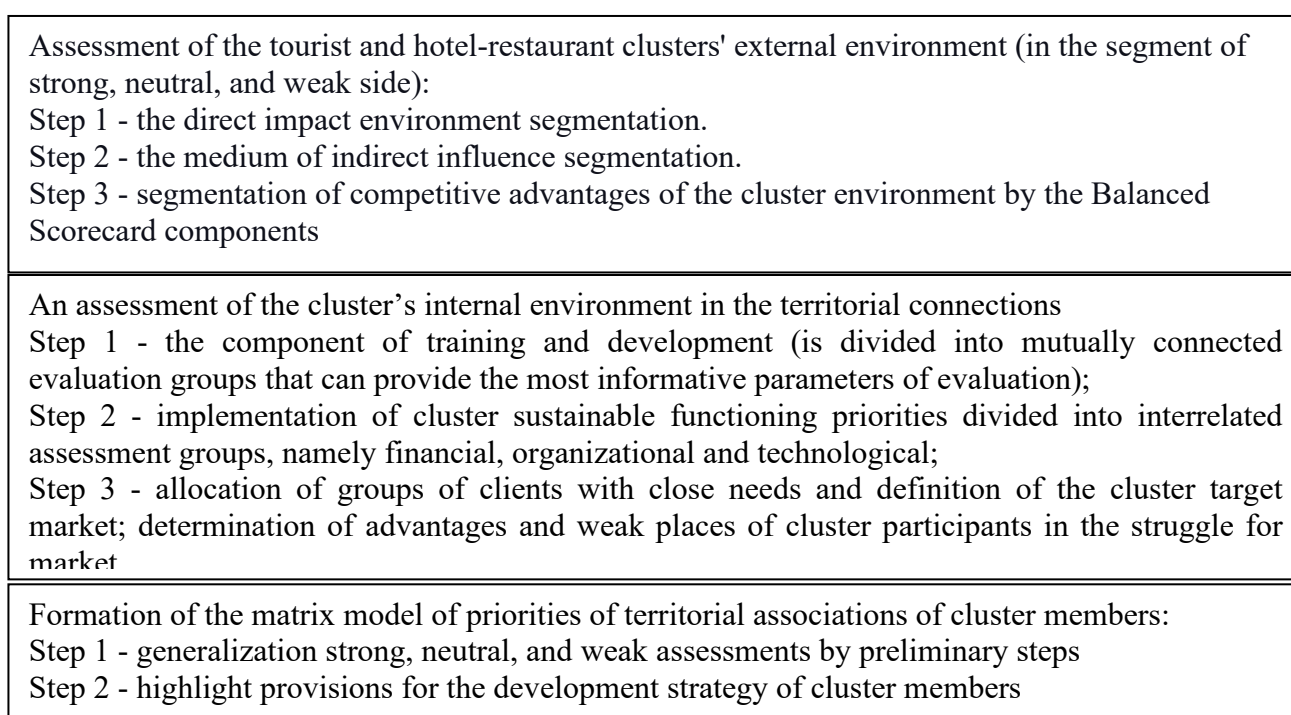


Fig. 1. The adjustment cycle steps of tourist and hotel-restaurant clusters based on Balanced Scorecard implementation

Source: created by the author

Estimates of the environment of clusters use segmentation algorithms of strong, neutral, and weak sides basis on the average value of direct influence indicators in segments S (strong side), N (neutral side), and W (weak side). As factors of influence on cluster members and their territorial formations expedient to accept:

- external actors of direct influence which not cluster members;



- indirect influence environment in political, economic, social and technological, ecological, and geographical factors;
- internal cluster environment.

4.2. The strategic assessment indicators by the participants' integration degree efforts

The strategic assessment indicators by the participants' integration degree efforts allocated according to the algorithms shown in table 2.

The degree of integration of efforts on each component of the segmental- points assessment scale was determined. Namely: Compliance (S) estimates at 3 points; partial compliance (N) estimates at 2 points; noncompliance (W) estimates at 1 point.

These areas include:

- marketing and informational support of activities;
- training and development of human capital skills;
- logistics.

Objectively allocated:

- distribution and procurement logistics;
- financial support of innovative tourist facilities.

These factors and the level of integration efforts in the outlined areas form the competitive advantages of the cluster in the tourism market.

It defines as a participant's opportunity integrated to produce the tourist product that meets the requirements of target clients while maintaining the integrity of functioning in the cluster. The evaluation of the internal environment of the cluster by the complex Balanced Scorecard and its quantitative and qualitative parameters, based on the gradation of factors in the segment segments:

- (S) strength;
- (N) neutral;
- (W) weakness.



Table 2 - The algorithms of strategic assessment indicator by the participants' integration degree efforts

Factors / strategic assessment indicator	Indicator
<p>Marketing (joint provision) (M): Analysis of the needs of the tourist product consumers in the areas of the cluster (M1); development of new tourist products (M2); analysis, forecasting of the state and development of the tourist market (M3); an assortment of the cluster policy (M4.1); services correlation (M4.2), their modifications (M4.3); market behavior of the participants (M4.5); joint development and management of communications in the seals (informing about tourist product or services, image formation (M7.1); branding and trademark cluster (M7.2); public relations (M7.3); loyalty programs (M7.4); communications with target clients (M7.5)).</p> <p>Integration of efforts determined by algorithms $M = \frac{M4.1+M4.2+M4.3}{3}$;</p> <p>$M_7 = \frac{M7.1+...+M7.5}{5}$</p>	<p>$M = \frac{M1+...+M7}{7}$,</p> <p>M1...M7 - strategic assessment indicator</p>
<p>Information support of activity in cluster information network cluster (I): Activity of participants based on the integration of individual elements of information systems (I1); mass product, information market, information, relevant actions on the transition from participant knowledge, cluster solution (I2); communication, technique, information technologies, characteristics of information resources (I3); 4) coordinated organizational and informational actions (I4)</p>	<p>$I = \frac{I1+...+I4}{4}$,</p> <p>I1...I4 - strategic assessment indicator</p>
<p>Training and staff training (joint provision) (H): 1) tasks (H1); 2) flexibility of management and adaptability to innovation (H2); 3) promotion of position (H3); 4) improvement of staff adaptation to new technology (H4).</p> <p>Innovations (staff development) (In): 1) joint planning, organization, and evaluation of innovation activity results (In1); 2) joint motivation of human capital to innovation activity (In2)</p>	<p>$H = \frac{H1+...+H4}{4}$,</p> <p>H1...H4 - strategic assessment indicator</p> <p>$In = \frac{In1+In2}{2}$,</p> <p>In1...I2 - strategic assessment indicator</p>
<p>joint logistics (l): 1) procurement component (l1): meeting the needs of cluster participants in providing services with maximum economic efficiency, quality, and in the shortest terms; transport logistics (l3); 2) distribution component (l2): intermediary operations, tourist trips between different operators, and cluster agents</p>	<p>$l = \frac{l1+...+l3}{3}$,</p> <p>l1...l4 - strategic assessment indicator</p>

Source: formed on the basis of [7; 4]

The training and development of employees are divided into mutually connected evaluation groups that can provide the most informative evaluation parameters.

Namely: Namely:

1) (φ1) the quality of human capital for which "skills and abilities" are important for the realization of the strategy of the participant development or:

- (φ1.1) specialized knowledge and qualification, as a knowledge degree corresponds to the certificate of qualification of professions of employees;



- (φ1.2) methodical knowledge fs a degree of compliance with requirements: abstract thinking; quick learning, adaptation to changes; communicative competence;
 - (φ1.3) behavioral skills as a degree of correspondence to the standard level provides: purposefulness, non-conflict, logical thinking; tolerance; attention;
 - (φ1.4) high-quality work or a combination of labor activity properties caused by the aspiration to fulfillment of labor tasks, by established requirements to quality and morality;
 - (φ1.5) productive work determined by its general results or production.
- 2) training of human capital in a cluster for which indicators (φ2) are determined by individual parameters of opportunities for learning and learning of educational material [108];
- 3) the effectiveness of human capital training (φ3).

The methodical algorithms of strategic estimation of the "human capital training" component of tourist and hotel-restaurant regions clusters are shown in Table 3.

Table 3 - The methodical algorithms of strategic estimation of the "human capital training" component of tourist and hotel-restaurant regions clusters

Indicator / rating criteria	Result indicator	
	by groups of indicators	total
Opportunities of human capital training (φ2.2): vacation for training through cluster participants (φ2.1); professional and material growth (φ2.2); experience exchange opportunities of participation (φ2.3); opportunities for free participation in impositions, round tables, exhibitions, seminars (φ2.4); holding by the enterprise: training, business, and leisure; opportunity of employees to participate in educational projects and programs (φ2.5).	$\underline{\varphi}_2 = \frac{\sum \varphi_i}{n};$ φi- the amount of the training opportunities of the human capital of a cluster member; n number of φi;	$\underline{\varphi}_{2-3} = \frac{\varphi_2 + \varphi_3}{2}$ - opportunities of human capital training; φ3 - effectiveness of human capital training (according to the certification results)
the effectiveness of training of human capital by results of certification (φ3): basic: assessment of labor results as the number of services provided or the value created by the job (φ3.1); determination of conformity of the occupied position (φ3.2); identification of deficiencies in the level of preparation and reserves of further development (φ3.3); additional: the ability to work in a team (readiness to take responsibility; risk, openness to dialog); executive discipline (φ3.4); psychological state, stress resistance (φ3.5); motivation to work (φ3.6)	$\underline{\varphi}_3 = \frac{\sum \varphi_i}{n};$ φi- components of the estimation of the effectiveness of training of the human capital of a cluster member; n - number of φi;	

Source: author's development



The value segmentation scale is as follows: S– the result satisfies the evaluation criteria; N – the result does not meet the evaluation criteria sufficiently but has a tendency to improve; W – the result does not meet the evaluation criteria sufficiently;

3) frame retention options (φ_4). The main factors that can keep staff in the workplace are:

- "Favorable psychological climate in the team";
- "Opportunities for raising wages and career growth";
- "Broad social package".

Methodological algorithms of strategic evaluation, given component of training and development of tourist and hotel-restaurant clusters in regions (φ_4) are given in table 4.

Table 4 - Methodological algorithms of strategic evaluation, given component of training and development of tourist and hotel-restaurant clusters in regions

Indicator / rating criteria	Result indicator	
	by groups of indicators	by groups of indicators
favorable psychological climate in the collective, ($\varphi_{4.1}$)	Group A "favorable psychological climate" is characterized by: good mood; mutual sympathy; mutual respect for one another's thoughts; activity of the collective and emotional union; the desire to work collectively; Group B "unfavorable psychological climate" is characterized by: suppressed pessimistic state; conflict of relations and antipathy; division of the collective; intolerance to the opinions of others; inertia and passivity of the collective; priority of own interests over personal interests.	$\varphi_4 = \frac{\sum \varphi_i}{n}$ 4 components of assessment $\varphi_{5.1}, \varphi_{5.2}, \varphi_{5.3}$; n quantity $\varphi_i = 3$
opportunities to increase wages and career growth ($\varphi_{4.2}$)	career growth opportunities depend on the pace of development of an autonomous member of the cluster and the general needs for staff expansion	
wide social package ($\varphi_{4.3}$)	availability: annual paid vacation, compensation of sick persons, possibility of providing service housing, medical insurance for the enterprise; organization of new year holidays and other holidays.	

Source: author's development

The average group assessment of the psychological climate is formed in compliance with the criteria estimated at 1 point. The maximum point value is within



6-4 points (S), 3,9-2 points are N, 2 points, and below it is W.

The average group assessment of the possibility of salary increases and career growth by the parameter of the participant's development by fast, medium, or low rates S (6-4 points). The recession or staff expansion development at 3-2 points estimate (or N). The enterprise is unprofitable and reduces the staff at a 1-point (or W) estimate. The average score provided that the criteria at 1 point estimate. Non-compliance criteria at 0 points estimate.

The need to allocate components to target clients of tourist and hotel-restaurant clusters in the regions connects with the fact that advantages from certain tourist products are necessary for certain groups of clients.

Strategic analysis is realized by segmentation of the market of territorial associations of tourist and hotel-restaurant clusters in the regions. It is appropriate to: allocation of groups of clients with close needs; target market drawing; determination of advantages and weaknesses in the struggle for market development.

The component of ensuring the sustainable functioning of territorial associations of clusters in the regions allocate as its participants should ensure the sustainable functioning of their work. It concluded that the sustainability of functioning is the ability to maintain competitiveness and the high importance of financial and economic indicators in the long term based on the regulation of financial, organizational, and technological components. 8; 9]. It is possible to provide the following characteristics such components:

1) the organizational component provides an organized, continuous, sustainable flow of the process of rendering tourist services to the cluster participants and their realization. It is necessary to determine how rhythmical the process of rendering tourist services to the cluster participants is. It should be noted that the rhythmical provision of tourist services depends on the work of its separate subdivisions. The specified analysis by the structural subdivisions of the cluster member is differentiated;

2) the technological component provides a stable increase in the technical level of the cluster members (grouped by territorial characteristics) using technological



preparation of production and innovative activity, which increases the quality of tourist products. This component defines economic indicators, which ensure the growth of the "labor productivity pyramid" and overall profit indicators. It is necessary to determine the efficiency of technological preparation for rendering tourist services.

Strategic evaluation of innovation activity on innovative objects is necessary. Different evaluation methods for this purpose uses. [8] (Table 5).

The technical level assessment effectiveness consists of profit growth, client number, and sales expansion estimation (Miltseva method). For this purpose, the triple introduction of a general indicator for the results in the form of benefits (from new technologies, types of products, processes). The technical level efficiency assessment gives:

- growth of profit, number of clients, or expansion of sales sphere (determined based on the generalized indicator for results (IP));

- benefits from new technologies, types of products, processes, and the improvement of quality of tourist products. A corresponding technical level assessment is possible by the SERVQUAL method. The evaluation uses 22 questions questionnaires, divided into service quality groups.

These questionnaires determine the client's satisfaction with the complex services provided before and after new technologies introduction, types of services, and processes corresponding to generalized quality indicator introduction (Table 6).

Table 5 - Methods of evaluation of the efficiency of innovation activity of tourist and hotel-restaurant clusters in the regions

Indicator / rating criteria	Result indicator		Conditional marks
	by groups of indicators	by groups of indicators	
1	2		3
Mayorova T. / implementation of the calendar	In case of implementation of all stages of	The indicator of the profitability of the innovation project	OP - the profit received, UAN; C - the volume of expenses for implementation



Continuation of the table 5

1	2	3
<p>plan is a qualitative criterion the efficiency of innovative activity characterizes.</p>	<p>the calendar plan, the effectiveness of the innovation project will be equal to 1. If one of the stages is unperformed it will be equal to 0. A total number of points (object performance efficiency): $EIF = EF_1 + EF_2 + EF_3 + k_1 EF_4 + k_2 EF_5 + k_3 EF_6 + k_4 EF_7 + k_5 EF_8 + k_6 EF_9 + EF_{10}$, With $EIF > 2$, the performance of an innovative object is effective</p>	<p>- $EF_1 = OP / C$. Net profit indicator - $EF_2 = NPS / 3$ The volume of the realized innovative products, goods, and services - $EF_3 = VP / C$ The number of employees involved in the project implementation - $EF_4 = K / 3$ Budget efficiency of an innovative project - $EF_5 = BEP / 3$ Number of types of innovative products, technological processes, goods, services - $EF_6 = IP / 3$ The total number of intellectual property rights of the innovational object's performer $EF_7 = IIIB / 3$ Total number of licenses $EF_8 = 1 / 3$ The number of revenues received from the sale of intellectual property rights created by the innovation project $EF_9 = IS / C$</p> <p>of the innovation object for the reporting period, UAN; NPS - the net profit received, UAN; VP- the volume of products, UAN; K - the number of employees, persons; BEP - the number of funds transferred to the budget, UAN; B- the volume of budget investments received by the executive at the realization of the object, UAN; IP - number of innovative products created at the appropriate stage of innovation project, units; IIIB - number of rights obtained for intellectual property objects, in particular: patents for inventions; patents for industrial designs and utility models; certificates for marks of goods and services (trademarks), units; 1 - number of licenses issued, units; IS - income from the sale of intellectual property rights created by the object, UAN.; k_i - gross factors</p>
<p>Fedorenko V. / there is no integral quality indicator. In addition, the indicators focused on profitability and cost-effective, while the increase in the number of clients (or expansion of sales) isn't account</p>	<p>The profitability index provides a period of reliable sales of products produced as an implementation result of an innovative object on the market with a constant high level of sales and profit (PP). $PP = \frac{Jny / Jky \cdot Nn \cdot \ln PC}{C + Cpt + Cptr}$ the algorithm is effective when it is possible to calculate the annual volume of future sales and unit price. However, the inclusion of only a period of steady sales considers a manifestation of caution since the period of possible product sales reduction envisaged by the project does not take into account. The rate of return on innovation project (P_o) takes into account the variability of the new service or process $P_o = \frac{PRKIHY}{CEx}$ The investment return of an innovative object takes into account the duration of the new product or process. At the same time, the</p>	<p>Jny- the probability of scientific success of innovative business object; Jky - the probability of commercial success of the innovative business project; NB_n- annual volume of sales of products produced by the proposed development and implementation of an innovative business project, pieces. (d); production, UAH; Tpr_s - period of reliable sales of products, years; C - the cost of development and realization of innovative business projects, UAH; expenses during production and technical products development, UAH;</p>



Continuation of the table 5

1	2	3
	<p>algorithm includes such mathematical expressions as the root square of the number, which is equal to the period of existence (PTP).</p> $PTP = \frac{JHY \times JKY \times Npn \times dPR \sqrt{Ti}}{CEx}$ <p>The algorithm used in the new products sphere includes selling prices and unit profits. In the case of calculation of the indicator at the realization of innovative projects in new equipment and technology field in algorithm uses annual economy amount, from the use of projects results.</p> <p>Comparative value indicator includes estimates of the probability of commercial success depending on the new products quality and other economic factors achieved as a result of the innovation project implementation (VI):</p> $VI = \frac{JHY \times JKY \times PR \times Cptr - \Delta KIHY}{CEx}$ <p>Instead of gross income, a net income is used, which ensures the implementation of the innovative business project.</p>	<p>PC - the price of units of Cpt- Cptr - expenses connected with market products promotion, UAH.; PR - calculated profit from development and realization of innovative project; UAH; KIHY-calculated factor of scientific success; CEx - calculated expenses for development and realization of innovative project; Npn - calculated volume of sales of products, pieces; dPR - calculated profit per unit. Production, UAH/day; Ti - the period of existence of new products or process, according to the innovation project.</p>
<p>Miltseva O. / indices are differentiated, but there is no integral indicator.</p>	<p>Growth of intangible assets (Prna): Prna = (H1 – H0)/ H0*100%</p> <p>Net profit increase (decrease in production costs) (PDP): PDP = (P1 – P0)/ P0*100%</p> <p>Increase in sales revenue (RPV): PLV = (B1 – B0)/ B0*100%</p> <p>Increase of number of clients (or expansion of sales sphere): RHD = (K1 – K0)/ K0*100%</p> <p>Cost-effectiveness of innovations: Cree = (F1 /C1)-1) *100%</p> <p>The ratio of innovation to overall profit over the last year (days). DVN = Bn /Po*100%</p>	<p>H0,H1 – value of intangible assets before and after new technology or product investment (UAH); P0, P1 - enterprise net profit before and after new technology or product investment (UAH); B0, B1 – sales profit before and after new technology or product investment (UAH); K0, K1 – number of clients, before and after investments in new technology or product (UAH); F1, C1 – financial result from innovation costs for them, UAH; Bn, Po, software – revenue from products sale and enterprise profit, UAH.; BP1, BP0-gross volume of production after and before use of innovation; DB1, DB0-added value after and before innovation; BM1, BM0 -</p>
<p>Savytska G. / there is no integral algorithm in the case of significant differential indicator. In addition, most</p>	<p>The third group includes indicators characterizing the production effect of innovation: growth of production volume (ΔVP): $\Delta VP = BP1 - BP0$; growth of added value ($\Delta \Delta B$): $\Delta \Delta B = DB1 - DB0$; economy of material resources (ΔMP): $\Delta MP = Qix(BM1 - BM0)$; economy of production cost reduction (ΔB): $\Delta B = Qix(c1 \times c0)$; reduction of working time fund for production ($\Delta \Phi RF$): $\Delta \Phi RF = Tm0 - Tmi$;</p>	



Continuation of the table 5

1	2	3
<p>indicators duplicate each other.</p>	<p>growth of average daily employee production (ΔBII); the material capacity of products reduction; reduction of consumption capacity of products: (ΔBII): $\Delta VP = B_0 \times \Delta B$. The second group includes indicators that characterize the financial efficiency of innovations: Increase of the margin of coverage, calculated as the difference between net yield and the amount of variable expenses on the sale of products (ΔMP): $\Delta MP = MP_0 - MP_1$; net income growth (ΔChD) due to the innovations: $\Delta ChD = ChD_1 - ChD_0$; profit growth to the payment ($\Delta EBIT$): $\Delta EBIT = EBIT_0 - EBIT_1$; increase of net profit after payment of interest and taxes (ΔPP): $\Delta PP = FHR_0 - FHR_1$; growth of marginal profitability, calculated by the ratio of total net margin of coverage to net revenue (ΔMD); cost-effectiveness increase (ΔPB), calculated by the ratio of profit from the sale of products to payment of interests and taxes to the cost of the sold products; increase in profitability of the turnover, calculated by the ratio of profit from the sale of products to payment of interests and taxes to the turnover (ARV); increase of net profit rate of products calculated by the ratio of net profit from sales of products after payment of tax interest to net profit amount (ΔRF); profitability increase of the total capital invested in the enterprise assets (ΔVER): $\Delta VER = VER_1 - VER_0$; increase of profitability of own capital as a ratio of net profit to average value of own capital (ΔAO). The third group includes indicators of investment efficiency of innovations: net effect, index of profitability, and discounted payback period.</p>	<p>consumption resources per unit of production before and after innovation; Q_{ix} - annual volume of production in natural expression after innovation; c_1, c_0 - the cost of a unit of production before and after innovation; T_{m0}, T_{mi} - respectively the capacity of production before and after application of innovation; B_0 - the number of production expenses innovation before; ΔB - expenses change due to the introduction of innovation; $MP_0 - MP_1$ - the margin of coverage after and before innovation; ChD_1, ChD_0 - income includes net profit and amortization after and before innovation; $EBIT_1 - EBIT_0$ - the profit amount from the operation to the payment of interest and taxes after and before innovation; $FHR_0 - FHR_1$ - net profit amount after and before innovation; VER_1, VER_0 - profitability of total capital after and before innovation.</p>

Source: formed on the basis of [10; 11; 12; 13; 14]

Indicators x6-x10 is the average score of the groups of service quality, in terms of:

- the quality of material elements (modern equipment presence, office interior, appearance of "contact zones" employees, information materials availability);
- reliability (fulfillment of obligations on provision of ordered services; protection of execution of ordered services; solution of problem situations of the client; reliability of reputation; absence of errors during execution of operations);



Table 6 - Assessment of innovative activity of territorial associations of tourist and hotel-restaurant clusters in the regions

Profitability and sales expansion indicators	Evaluation point scale (1-3 б).	Basic groups of service quality (by questionnaire)	Evaluation point scale (1-3 б).
intangible assets growth (x1)	↓ - value – 1 б., constant value – 2 б., ↑ – 3 б. «...», if the indicator is more than 0, otherwise the result is estimated at 1 point.	Quality of material elements (x6)	↓ - value – 1 б., constant value – 2 б., ↑ – 3 б.
net profit increase (x2)		Reliability (x7)	
sales revenue growth (x3):		Reactivity of personnel (x8)	
Increase in the number of clients or sales expansion (x4):		Staffing format (x9)	
profitability of innovations (x5)		Empathies (x10)	
A general indicator of profitability and client's number or sales expansion - IP	(According to the evaluation point x1-x5) $I_{IP} = \frac{\sum x1 \dots x5}{5}$	A general indicator of service quality Iq	(According to the evaluation point x9-x10) $\frac{\sum x9 \dots x10}{5}$

Source: author's development.

- reactivity of personnel (discipline, responsiveness, help desire, clients' requests of response speed);
- staffing format (advising clients; effective service and support; courtesy and kindness; creation of a climate of trust and mutual understanding with clients by employees of the "contact zone");
- empathy (individual approach to the client; orientation on solving clients' problems; clients' needs knowledge; personal participation of employees in solving clients' problems; information support of clients by employees).

The advantages of such an assessment overcome the difficulties of translating thought to the quality of tourist products given to the cluster participants (grouped by territorial sign) in the quality indicators area.

Among such areas of the financial component is the ability of cluster participants (grouped by territorial characteristics) to work profitably and time to pay for obligations.

This component should evaluate in 3-panels, namely:

- profitability, as characteristics of efficiency of territorial associations of tourist



and hotel-restaurant clusters in regions, which determine the rationality of use of means of production, and deficit resources;

- solvency as a characteristic of the territorial association's ability to repay their obligations in the long term and to continue activity;

- creditworthiness, as characteristics of territorial associations on potential opportunities to repay obligations to creditors and the degree of risk of the bank at its crediting.

The profitability rates of territorial associations of tourist and hotel-restaurant clusters in the regions are equally informative and standard. These are:

- profitability of services realization;
- profitability of operational activities;
- profitability of own capital.

Assessment of solvency and creditworthiness of territorial associations of tourist and hotel-restaurant clusters in the regions connect with complexity. This assessment can't use generally accepted liquidity ratios.

Functioning in the cluster requires a position where the participant must have the funds to repay the obligations and liquidity reserves to continue his activity.

It is expedient to estimate solvency by qualitative characteristics. The main role in the assessment is to analyze the liquidity of the balance of participants grouped by territory. This estimate is a comparison of funds with short-term liabilities (table 7) and the calculation of the ratio of total liquidity (K_0). If the value is more than 1, the participants of the cluster group by territory have reserves of liquid assets for the continuation of activity. Although the absolute value of the participant's reserves is not determined. However, the factor of untimely turnover of assets in funds should be taken into account. The factor is taken into account the indicator K_0 using weight factors: 1 - importance value; 0,5- value has average importance for the maintenance of liquidity; 0,3 - value does not significantly affect liquidity. The indicator does not reveal liquidity reserves.



Table 7 - Methodical algorithms of estimation of liquidity of territorial associations of tourist and hotel-restaurant clusters in regions

Assets	Liabilities	Ko, to prevent the assets from being transferred to the funds at the same time	Initial conditions of solvency
According to the level of liquidity of assets	On the terms of payment of obligations		
– most liquid assets (MAL) = M+CFI; – quickly realized assets (QRA) = CR<1+IOA; – slowly realized assets (SRA) = CR>1+R - BMP+ ITFI; – hard realize assets (HRA) = A1- ITFI -CR>1	– the most urgent liabilities (MUL) = I5; – short-term liabilities (STL) = ML; – long-term liabilities (LTL) = R4; – permanent liabilities (PL) = R3- PFP	$(MLA + 0,5QRA + 0,3SRA) / (MUL + 0,5STL + 0,3 LTL)$	MLA ≥ MUL (1) QRA ≥ STL (2) (1) and (2) – is a features of the current liquidity SRA ≥ LTL (3) HRA ≤ PL (4) (3) and (4) is a features of expected liquidity position

*M – money and its equivalents; CFI – current financial investments; CR <1 - accounts receivable with maturity up to 1 year (settlements with suppliers, employees, and government agencies to pay for services, goods, salaries, taxes, and other urgent payments); IOA – other current assets (amounts of current assets that cannot be included in the above articles in the section " current assets"); R - reserves of raw materials, materials, finished product, work in progress, for the transformation of which in cash need much longer term; CR>1– accounts receivable with repayment period under 1 year; ITFI – long-term financial investments; A1 – result 1 section of the balance sheet; I5 – loans and liabilities the repayment terms of which have come into force (liabilities on received advances, budget liabilities, extrabudgetary liabilities, insurance liabilities, labor payment liabilities, and participants liabilities); ML- medium-term liabilities with a maturity under 1 year; PFP- profits of future periods; R4 – result 4 sections of the balance sheet; R3 – result 3 section of the balance sheet. Source: formed on the basis of [15; 16; 17].

It is expedient to apply the specified method of estimation of balance liquidity of the cluster members grouped geographically. It is expedient to apply the specified method of estimation of balance liquidity of the cluster members grouped geographically. It is expedient based on the normative discount’s method takes into account the time of the turnover of assets in funds and the terms of the obligations, which in one group may differ in time (Table 8).



Table 8 - Algorithm of estimation of liquidity of balance of territorial associations of tourist and hotel-restaurant clusters in regions*

Assets taking into account the standard method of overloading		Liabilities taking into account the standard method of overloading		Initial conditions of solvency
According to the degree of liquidity *	Rules of overloading	On the terms of payment *	Rules of overloading	
- most liquid assets (MAL) = $M \times 1 + 0,7 \times CFI + 0,1 \times CR < 1$, - quickly realized assets (QRA) = $0,3 \times CFI + 0,8 \times CR < 1 + 0,7 \times IOA$; - slowly realized assets (SRA) = $0,8 \times CR > 1 + 0,3 \times IOA + 0,1 \times CR < 1 + 0,6 \times R + 0,9 \times ITFI$; - hard realize assets (HRA) = $0,2 \times CR > 1 + 0,4 \times R + (A1 - (0,9 \times ITFI)) + BMP$	In MAL group include 100% of M, 70% CF and 10% CR < 1 In QRA group include 30% CFI; 80% CF < 1 and 70% IOA In SRA group include 80% CF > 1 та 10% CF < 1, 10% IOA, 60% 3 та 90% ITFI. In HRA group include 20% CF > 1; 40% R; non-current assets less 90% ITFI + 100% BMP.	- the most urgent liabilities (MUL) = $I5 \times 1 + 0,2 \times OCL$; - short-term liabilities (STL) = $0,8 \times ML + 0,2 \times OCL + 0,6 \times STL$ - long-term liabilities (LTL) = $0,2 \times ML + 0,9 \times LTC$; - permanent liabilities (PL) = $0,6 \times STL + 0,1 \times LTC + OC + PFP$	In MUL group include 100% I5 and 20% OCL; In STL group include 80% ML; 20% OCL; 60% STL; In LTL group include 20% ML; 90% LTS In PL group include 60% STL, 10% LTS, 100% CO and PFP.	$MAL \geq MUL$ (1) $QRA \geq STL$ (2) (1) and (2) – is a features of the current liquidity $SRA \geq LTL$ (3) $HRA \leq PL$ (4) (3) and (4) is a feature of liquid deficiency or surplus or K liquidity reserves. $(Kpl) \geq 1$

*OCL – Other current liabilities; STL – short-term loans from banks; LTC – long-term long-term; OC- own capital

Source: formed on the basis of [15; 16; 17]

The received balance sheet liquidity data account for asset turnover inhomogeneity and liabilities. Therefore, the calculation of the indicator (KO) isn't reasonable. There is a possibility to define the liquid profile or deficit of territorial associations of tourist and hotel-restaurant clusters based on the liquidity reserve ratio.

As to the assessment of the creditworthiness of cluster members grouped



according to territorial characteristics, a considerable number of approaches can apply to the territorial associations of the cluster (Table 9).

Table 9 - Approaches to the estimation of creditworthiness of the tourist and hotel-restaurant cluster participant

Approaches	Interpretation of the content	Disadvantages
Tereshchenko O. [18]	Use for estimation of groups of financial ratios. Namely: liquidity and solvency (absolute, current, term, working capital); capital structure and property structure of the enterprise (debt, autonomy, etc.); profitability and self-financing of the enterprise (return on equity, the profitability of sales, etc.); turnover (investment capital, circulation of working capital, etc.). Using analysis shows that the enterprise can service its debts. The conclusions objectivity increased in comparison to the values of the indicators with the recommended, medium-branch, and dynamics.	In conditions of application of financial factors, the situation is possible under which some indicators exceed normative values and others have low values. The
Andriychuk R. [19]	Use for estimation of groups of financial ratios. Namely: liquidity (absolute, current, term); the turnover rate of circulating assets; profitability of realization; rate of growth turnover rate of circulating assets; the rate of growth asset turnover. The class of each financial ratio is determined by comparing the actual values of their values with the generally accepted standards, thus forming the total rating of the borrower.	normative values of financial factors do not account for the specific activity of a cluster member, so they are conditional.
Popovich P. [20]	The general estimation uses the analysis of the dynamics of profit on the invested capital determined by the ratio of the amount of profit to the total amount of liabilities on the balance sheet. The change of the indicator reflects the tendencies in the sphere of profitability and creditworthiness of the borrower. An accurate assessment of creditworthiness is offered based on a quantitative analysis of liquidity ratios, operational capital flexibility, and security ratio.	The ability of the participant to attract and timely return the attracted funds cannot be characterized by differentiated financial factors.
Sheludko V. [21]	Analysis of performance indicators. Namely: volume of sales; profits and losses; profitability; liquidity ratios; cash flows; structure of accounts receivable and accounts payable; the competitive position of the borrower on the market; history of repayment of credit debt; effectiveness of management.	The general coverage of obligations should be identified by the existing funds.
Ostafil O., Rubakha M. [22]	Based on a system of financial ratios such as liquidity ratios (current, urgent, absolute), business activity, financial stability (autonomy, loan capital concentration, independence, and flexibility of own funds), profitability, and indices of the cash flow of the enterprise. Based on the conducted analysis and standards the rating indicator of the financial condition is calculated.	

Most of the approaches to estimation find problem places based on differentiated liquidity characteristics, business activity characteristics, etc. To



identify the future strategic direction of integration development, identification of the participant's ability to return the borrowed funds is necessary. It can't be based on ratio analysis. It is necessary to forecast the probability of bankruptcy.

This feature is an integrated reflection of the ability of cluster members (grouped by territory) to return borrowed funds and to carry out effective regulation of the volume of borrowed capital.

Most modern models of forecasting the probability of bankruptcy (Table 10) are subject to the normative values of financial ratios created for large companies' public sector clients. There is a low degree of adaptation of models to the specificity of the tourism sphere. According to 2019, 93% of enterprises in the Transcarpathian region are small and medium [23, pp. 1177-1183]).

Table 10 - Systematization of models for forecasting the probability of bankruptcy of territorial associations of tourist and hotel-restaurant clusters in regions

Models	Algorithm	Symbols	Disadvantages
1	2	3	4
Altman model (classic)	$Z=1,2X1+1,4X2+3,3X3+0,6X4+X5$ If the value from 1.80 and less - value Z is maximum; if value from 1,81 to 2,70 - value Z is high; if value from 2,71 to 2,90 - value Z is average; if value from 2,91 and above - value Z is minimum.	Z – the probability of bankruptcy; X1 — the ratio of own negotiable capital to total assets; X2 — the ratio of net profit to total assets; X3 — the ratio of financial result from ordinary activities to total assets; X4 — the ratio of own capital to raised capital; X5 — the ratio of net income from sales of products to total assets.	Models are used to predict the probability of bankruptcy of large companies <i>and public sector clients</i> . . <i>The models assume that any enterprise with profitability indicators below a limit is unable to loan funds repay because it is not liquid in the long term. In domestic conditions, profitability may depend on the seasons of tourist activity. Even with significant profitability, some funds may be withdrawn from circulation.</i>
Altman model (modified)	$Z_M=0,717X1+0,847X2+3,107X3 + 0,42X4 + 0,99835$. If the value from 1,80 and less - value Z is maximum; if the value from 1,81 to 2,70 – value Z is a high; if the value from 2,71 to 2,90 – value Z is average; if the value from 2,91 and above - value Z is minimum. and above - value Z is minimum.	X1 – the ratio of working capital to total assets; X2 – the ratio of retained earnings to total assets; X3 – the ratio of operating profit to total assets; X4 – the ratio of the market value of shares to debt; X5 - the ratio of asset value to total assets; X5 — the ratio of the balance value of shares to the loan capital	



Continuation of the table 10

1	2	3	4
Liss model	$Z=0,063X1+ 0,092X2 + 0,057X3+ 0,001X4$ Minimum value $Z < 0,037$	X1 — the ratio of working capital to total assets; X2 — the ratio of profit from the sale to total assets; X3 — the ratio of retained earnings to total assets; X4 — the ratio of own capital to loan capital	«...»
Tifler model	$Z =c0+ c1x1 +c2x2+c3x3+ c4x4,$ Minimum value $Z < 0,2.$	x1 – ratio of income to tax payments to current liabilities (53%); x2 – ratio of current assets to total liabilities (13%); x3 – ratio of current liabilities to total assets (18%); x4 – no crediting interval (16%); c0...c4 – ratios, %. In brackets model proportions indicate. At that, x1 – measures profitability; x2 state of working capital; x3 – financial risk; x4 – liquidity.	
Biver model (classic)	$K= \frac{\text{net profit} + \text{depreciation}}{\text{section 4} + \text{section 3 balance}}$ If the value from 0,4 to 0,45 – k identifies good state; if the value equal 0,17 - enterprises for 5 years before bankruptcy; 0,15 - enterprises in bankruptcy	If during a period (1,5-2 years), the Biver ratio does not exceed 0,2, then this shows the formation of an unsatisfactory balance sheet structure and danger of bankruptcy.	
Biver model (stretched)	The model can be presented using indicators of bankruptcy diagnostics: KB; x1	KB — Belver coefficient (good state 0,4-0,45); X1 – asset profitability (if the value from 6 to 8 it identifies good state; if the value equal 5 -enterprises for 5 years before bankruptcy; if the value low than 5 enterprises for one year before bankruptcy); X2 financial leverage (if the value ≥ 37 it identifies a good state; if the value $\geq 50\%$ - the enterprises for 5 years before bankruptcy; if the value $\geq 80\%$ the enterprises for one year before bankruptcy); x3 – the ratio of maneuver (if the value 0,4 it identifies good state; if the value $\geq 0,3$, the enterprises for 5 years before the bankruptcy, if the value 0,06 - the enterprises for one year before bankruptcy); x4 –	«...»



Continuation of the table 10

1	2	3	4
		coefficient of coverage (if the value $\geq 3,2$ it identifies good state; if the value $\geq 1,0$ the enterprises for one year before bankruptcy if the value $\geq 2,0$ - the enterprises for 5 years before bankruptcy)	
R model	$R = 8,38 * K1 + K2 + 0,054 * K3 + 0,63 * K4$ If R is less than 0 is the maximum probability; if the value is less than 0,42, the probability of bankruptcy is minimal	K1 – the ratio of working capital to the total asset; K2 – the ratio of net profit to own capital; K3 – the ratio of sales to asset value; K4 – the ratio of net profit to integral expenses	«...»

Source: formed on the basis of [24; 25; 26, pp. 101-107]

It is expedient to carry out a strategic analysis of the credit feasibility of territorial associations of tourist and hotel-restaurant clusters in the regions to identify the probability of bankruptcy on the provision of short-term liabilities by monetary and financial negotiable funds. To ensure the minimum risk of bankruptcy, must fulfillment of irregularities:

$$CO \leq C + CFI + L, \tag{1}$$

Where: C - cash and equivalents;

CFI – current financial investments;

L – liquid reserves (production, commodity, which have not been used for a long time and are not taken into account);

CO- current liabilities

Thus, the probability of bankruptcy (Z) can be calculated according to the algorithm:

$$Z = \frac{C + CFI + L}{CO} \rightarrow \geq 100\% - Z(S) < 100\% \left(\text{if } \frac{\Pi_3}{\Delta_3} \leq 1 \right) - \text{cepe. } Z(N) < 100\% \left(\text{if } \frac{CL}{CR} > 1 \right) - \max Z(W), \tag{2}$$

Where: $\frac{CL}{CR}$ - self-financing of current operations, which is determined based on the current liabilities' ratio and current receivables ratio. At the same time, the ratio $\frac{CL}{CR} > 1$ of withdrawal of funds from economic circulation and needspine for



additional attraction of short-term credits for the financing of operational activity. If the excess has a steady trend, this shows an increase in the deficit of the most liquid assets and inefficient management of loan funds.

The need to allocate the target clients of territorial associations of the cluster participants connects with the advantages of certain tourist products or services are necessary only to groups of clients who form the target market. In a strategic analysis in this sphere, it is advisable to realize the uses of market segmentation of a cluster or its associations. Namely [247, pp. 120-180]:

1) allocation groups of clients with close needs (this will allow working separately with each group of clients, according to their interests);

2) to outline the target market of the cluster for competent management of advertising campaigns;

3) determination of advantages and weak places of the cluster participants in the fight for the market.

All selected steps should become the basis for the final portrait of the cluster, assessment of its stability, and determination of the direction of strategic integration development.

The proposed approach to the regulation cycle of tourist and hotel-restaurant clusters in the regions the Balanced Scorecard uses is a suitable basis for the algorithms of the cloud environment with the use of big data.

Using a Balanced Scorecard as a basis for the corporate strategy of integration development and strategy development of territorial associations of tourist and hotel-restaurant clusters will allow forming priorities of its participants' activity.

If the Staffing & Recruiting tools (platforms for configuring information processing algorithms) integrate the following steps to search for regularities in the data arrays and interpret the received facts, it will form the possibility of identifying the order of actions to bring the cluster members closer to the parameters of optimality. It helps to identify the cluster's states according to integrated development strategies. It allows to forecast and correct the cluster states and priorities of operation.



4.3. The trigger system of optimization of the property value of tourist and hotel-restaurant cluster participants in regions

The presentation of the property of each participant of the tourist and recreational cluster in the region is carried out in several squares:

1) representation of assets by form (liquid expression) and content (in general). Determination of the form of assets (A) is carried out in the following way: Monetary (Mf) or non-monetary form (NMf);

2) representation of capital (M) by ownership, under own (OC) and borrowings (BC), with the parallel allocation of the loan and own capital in cash (OCm and OCm) and non-monetary (OCnm and OCnm), depending on the direction of their advance.

This technique allows providing the contents of the form of assets of a member of a cluster, at the same time identifying them by belonging. The logic of presentation of the property of the cluster participant, according to the form and content shown in Table 11.

The given dependencies allow to create the expression of the property structure of the cluster member (namely - everything he owns) in a two-level matrix, which summarizes the unified balance data in the following formats [28]:

- static form where all properties are identified on a liquid;
- dynamic form where all properties are identified with an emphasis on values of growth.

If the value of money capital is negative during the formation of the matrix of determining the forms of the solvency of the tourist and hotel-restaurant cluster participant, structural optimization of the property value in a non-monetary form is necessary.

The optimization process should implement based on the extended trigger system, the structure of which is systematized by us in table 12.



Table 11 – The logic of presentation of the property of the cluster participant, according to the form and content

Representation of assets (A) of each cluster member			Capital representation (C) of the cluster member			Data representation logic (Δ - change the indicator)
Liquidity	Contents	Specifics of drawing of solvency forms	Form	Form contents	Specifics of drawing of forms of solvency	
OCm	cash funds booking office, funds on the settlement account; funds on the road; short-term financial investments	allocation of real payment means, or means that are easily converted into payment means	BCm	monetary credit and other funds and interest on it	obligations are accounted for monetary form	expression of the property structure of the participant, which summarizes the balance data in the following formats: 1) static form with illustrative relationship BCnm/OCnm and BCm/OCm (at the beginning and the end of the reporting or planned period); 2) dynamic form focus on growth BCnm/OCnm and BCm/OCm (or $\Delta BCnm/\Delta JCnm$ and $\Delta BCm/\Delta OCm$).
OCnm	Non-current assets; reserves of raw materials and materials or fuel for providing tourist services; other reserves and current assets; receivables; expenses of future periods	The presented assets by liquidity level characterized. However, they cannot be considered real payment instruments at the current time	BCnm	commercial loan involved; advances paid and other obligations; bills received; wage obligations; restitution obligations	short-term and long-term liabilities, loans and loans transferred to assets, are accounted for non-monetary form	

Source: formed on the basis of [28]

The trigger is applied in the meaning of the noun trigger - in a general sense, triggering something element.

The efficiency of the given system in the structural optimization of the assets of the cluster participants is proved in the author's research [16; 17]. It is appropriate to pay the most attention to the structure of assets in non-monetary form (as such, which most influences the nature of the exchange, the nature of distribution, and financing operations; on the nature of solvency and creditworthiness), based on the Wilson model and other optimization algorithms (including the Miller-Orr model, which account for the chaotic changes in the balance of money up to a *certain limit*) [16; 17]. When reaching the lower limit, previously acquired securities should be



Table 12 - Trigger system of optimization of the property value of the participant of tourist and hotel-restaurant cluster in regions

Trigger	Optimized trigger algorithm	Influence
Raw materials and materials reserves (based on Wilson model)	<p>1. if the price is unchanged $C^w(q) = \frac{CsD}{Q} + \frac{1}{2} c1Tq$ where the optimal volume of supply q_0^w will be: $q_0^w = \sqrt{\frac{2CsD}{c1T}}$</p> <p>2. the price changed and it takes into account storage costs. $Cw(q) = \frac{1}{2} \times Q \times C1 \times \left(1 - \frac{\epsilon C1}{100}\right)$ $Qx < Cw(q) \leq Qx2$, . if the consignment price equal $C1 \times \frac{\epsilon C1}{100}$ $Cw(q) = \frac{1}{2} \times Q \times C1 \left(1 - \frac{\epsilon C1(i-1)}{100}\right) Qx(i-1) < Cw(q) \leq Qxi$ if, tariffs for transportation it is elastic and depends on the quantity of the cargo: $Cw(q) = \frac{1}{2} \times Q \times C1 \times \frac{RZ}{100} + C_{\text{змінін}} \times \frac{D}{Q} + \tau \times D$</p>	exchange, distribution and financing
total amount of reserves (Ra)	<p>$Ra = (Ntch \times Od) + Rps + Rts$, if $Thtx = \frac{360}{\text{Profit}}$ $\frac{\sum \left[\left(\frac{Ad}{D} \times Td \right) \times Price \left(\frac{Ad}{D} \times Tdr \right) \times Price \left(\frac{Ad}{D} \times Ttrans_n \right) \times Price \left(\frac{Ad}{D} \times Tp \right) \times Price \right] + \left(\frac{Ad}{D} \times Price \right) \right]}{\text{Profit}}$</p>	«...»
accounts receivable	$OD3 = \frac{OPk \times Ps / p \times (PSP + DP)}{P \times \Delta n}$	
Cash	<p>Using the range for chaotic fluctuations of the balance determined by the algorithm: $DCO_M^0 = R * \left(\frac{3}{4} \times \frac{\beta \times \sigma^2}{r} \right)^{1/3}$ - the optimal limit to maintain liquidity and protect funds from inflation, when reaching the maximum limit of DCO_{MAX}^0 it is envisaged to convert liquid balance into securities or deposit account to DCO_M^0.</p>	«...»
short-term credit financing (STcf)	costs of service production (upper limit): $STcf = AOp - FAp - APt_{min_n}$	solvency and creditworthiness
long-term credit financing (CF)	net working capital based on its purpose (upper limit) $CF = ITCF - ITCF1$	

* $6\sigma^2$ - dispersion of annual cash flows, UAN.; β - expenses on conversion of monetary funds into securities, UAN.

Source: author's development.

implemented by an amount sufficient to replenish the reserves to the primary value. Thus, according to the Miller-Orr model, the trigger will be based on a range of fluctuations calculation of the balance of monetary funds between the maximum and minimum values (DCO_M^0).

The advanced trigger system of optimization of the value of the property of cluster member is formed by the following symbols:



1 symbol for the trigger of stocks of materials and raw materials: D – demand for services for the period T ; cS – the cost of a consignment of goods in volume Q ; $c1$ – the cost of storage of stocks units for the period T ; discount in % to the base price (ϵ); C – the price of the consignment; Q_{xi} – the volume of purchase with minimum ϵ ; C_{3MII} – costs per order; τ – the rate of the transporter per unit of cargo, relative D (installed depending on the distance of cargo transportation);

2 symbols for the trigger of the total amount of reserves (R_a): N_{tch} – the standard of current storage stocks (a constantly updated part of stocks, which is formed regularly, and is evenly consumed in the production and sale of products to consumers), in the days of turnover; O_d – the one-day volume of raw materials and materials for rendering services (in required volumes); R_{ps} , R_{ts} – planned stock of seasonal and target stock; T_d , T_{Tp} , T_{trans} – delivery interval and transportation period in days; T_{dr} – days of reserve stock (based on the maximum period of possible disruption of supplies); T_p – term of preparation for production use; A_d – annual demand in this type of materials and raw materials; D – number of days per year; Profit – profit from services realization.

3 symbols for the trigger of accounts receivable: OP_k – planned volume of services realization; P_s/p – the result of the ratio of the cost and price of the tourist product or service, expressed by a decimal fraction; $(PSP)^{-}$ – average period of service provision, days; $(DP)^{-}$ – average deferred payment, days.

4 symbols for the trigger “short-term loans to finance costs of service production”: OAp – the planned total cost of production of tourist services or products; FAp – forecast amounts of net working capital (represented by different forecast values of current assets and current liabilities); AP_t – the planned value of accounts payable on commodity operations; AP_{tminn} – the minimum amount of current liabilities on settlements planning;

5 symbols for the trigger of «long-term credit financing»: $ITCF$ – the amount of long-term credit financing of activity; $ITCF1$ – the amount of long-term credit financing attracted by an autonomous participant and has a purpose.



Conclusions

The goals of cluster members are diverse. Business entities are to maximize personal profit. Educational and scientific institutions form values necessary for the successful realization of the communities of citizens who can provide independence, initiative, and systematic activity. Local self-government bodies are responsible for solving social and economic development issues of cities, villages, settlements, etc. Therefore, ensuring the functioning and development of tourist and hotel-restaurant clusters requires:

- balance-indicators of operational results of the participants' activity and progress in achieving goals or a system of interrelated indicators;
- balance-sheet instruments of cluster development regulation;
- the description forms of activity.

Regulation of development of cluster participants is expedient through strategic planning, translation of goals, and tasks of activity in a two-level Balanced Scorecard that implements the concept of development by goals.

Regulation of development of cluster participants is expedient through strategic planning, goals, and tasks translation in a two-level Balanced Scorecard that realizes the concept of development by goals.

The first hierarchical level of the Balanced Scorecard summarizes components:

- external environment;
- development and training of cluster participants;
- target clients of the cluster;
- failure protection.

The second hierarchical level of the Balanced Scorecard summarizes components:

- internal and external environment;
- development for the training of cluster members' employees or their associations;
- target clients of cluster members and their associations;
- ensuring stable functioning in the cluster.



As a basis for separating development processes among other changes in the system, a balanced base form of the strategy of:

- cluster integration development;
- participants or associations of participants' development.



References

1. Braun Mark G. (2005), Sbalansirovannaya sistema pokazateley: na marshrute vnedreniya. [Balanced Scorecard: On the Road to Implementation] Moscow: Alpina Business Books.
2. Kaplan, R. and Norton, D. (2003), Organizatsiya, oriyentirovannaya na strategiyu. [Organization focused on strategy]. M.: OlimpBiznes.
3. Kaplan, R. and Norton, D. (2006), Sbalansirovannaya sistema pokazateley. Ot strategii k deystviyu [Balanced scorecard. From strategy to action]. 2nd ed., rev. and additional M.: CJSC "OlimpBusiness".
4. Kaplan, R. (2005), Strategicheskiye karty. Transformatsiya nematerial'nykh aktivov v material'nyye rezul'taty [Strategic maps. Transformation of intangible assets into material results.]. M.: ZAO «OlimpBiznes».
5. Kyzym, M.O.& Pylypenko, A.A. and Zinchenko, V.A. (2007), Zbalansovana systema pokaznykiv. [The Balanced Scorecard], Kharkiv.: INZHEK.
6. Korytko T.Yu. (2012), Development of a balanced system of indicators for the formation and implementation of the regional development program. *Visnyk Donbas'koyi derzhavnoyi mashynobudivnoyi akademiyi*, vol. 1 (26), pp. 127
7. Apatova N.V. and Honcharova O.N. (2001), "Territorial and sectoral models of the recreational complex of Big Yalta", *Kul'tura narodov Prichernomor'ya*, vol 25, pp.12-15.
8. Oleksyuk S.G. (2016), Economic cluster: Concept, structure. Structure. Types". *Visnyk Khmel'nyts'koho natsional'noho universytetu*, vol. 2(1), pp. 182-1888
9. Meteleva, E.R. (2011) "Network approach to urban development management: Basic concepts, key provisions, directions of use", *Nauchny`j vestnik Ural'skoj akademii gosudarstvennoj sluzhby`*, vol. №2. [Online]. available at: <http://vestnik.uapa.ru/ruru/issue/2011/02/11/> (Accessed 01.03.2020).
10. Andriychuk, R.V. (2007), "Methodical approaches to the analysis of profitability and break-even of production and optimization of its assortment", *Ekonomika APK*, vol. 5, pp. 133-140.
11. Ryneyskaya, L. S. (2016), "Klastery u suchasni hlobalnii ekonomitsi" [The clusters in the modern global economy]. *Efektivna ekonomika*, vol. 5. [Online]. available at: <http://www.economy.nayka.com.ua/?op=1&z=4971> (accessed 27 April 2022).
12. Ruegg-Sturm J. and Achtenhagen L. (2000), "Network organizational and managerial forms - fashion or necessity?", *Problemy teorii i praktiki upravleniya*, vol. 6, pp. 68-72.
13. Herman A. van den Berg. (2003), Models of Intellectual Capital Valuation: A Comparative Evaluation. *Working papers Queen's University Kingston*, p. 33.
14. Farat, O.V. and Zalutskyi, V.P. (2015), "Problems of development of



innovative clusters of industrial enterprises”, *Актуальні проблеми економіки*, vol 2 (164), pp. 229-237.

15. Markuzen A. (2013), Fuzzy concepts, proxy data: Why indicators would not track creative placemaking success. *International Journal of Urban Sciences*, vol. 17(3). pp. 291-303

16. Maslihan, O.O. and Kampov, N.S. (2019), Methodological algorithms of sustained functioning of tourism and recreation enterprises in clusters. *Ekonomichni Horyzonty*, vol. 3(10), pp. 54–65.

17. Maslihan, O. and Medvid, L. (2021), Tourism and recreation cluster system description model in cloud Big Data. *Modern engineering and innovative technologies, Germany*, vol. 16, pp. 152-166.

18. Tereshchenko, O.O. (2003), *Finansova diyal'nist' sub'yektiv hospodaryuvannya* [Financial activity of economic entities]. Kyiv: KNEU, 2003. 554 p.

19. Andriychuk, R.V. (2007), “Methodical approaches to the analysis of profitability and break-even of production and optimization of its assortment”, *Ekonomika APK*, vol. 5, pp. 133-140.

20. Popovych P.Ya. (2008), “Economic analysis of business entities”, [Online], available at: http://pidruchniki.ws/15840720/ekonomika/ekonomichniy_analiz_diyalnosti_subyektiv_gospodaryuvannya_-_popovich_pya (accessed 27 April 2022).

21. Shelud'ko, V.M. (2008), *Finansovyy rynek* [Financial market], 2nd ed., [Online], available at: http://pidruchniki.ws/1584072039365/finansi/finansoviy_rinok_-_sheludko_vm (accessed 20 April 2022).

22. Ostafil', O. and Rubakha, M. (2009), “Comprehensive assessment of the borrower's creditworthiness as a tool for bank credit risk management”. *Formuvannya rynkovoyi ekonomiky v Ukrayini*, vol. 19, pp. 387–396.

23. Gorodetski, A. and Ilyashenko, Yu. (1996), Minimal and strange attractors, *International Journal of Bifurcation and Chaos*, vol. 6(6), pp. 1177-1183.

24. Farat, O.V. and Zalutskyi, V.P. (2015), Problems of development of innovative clusters of industrial enterprises, *Aktual'ni problemy ekonomiky*, Vol. №2 (164), pp. 229-237.

25. Lepeiko, T.I. and Dotsenko, T.O. (2011), “Analysis of modern methods of forecasting the probability of bankruptcy of an enterprise”, *Finansovo-kredytna diyal'nist': problemy teorii ta praktyky: Zbirnyk naukovykh prats'*, vol. 1(10.)

26. Plastun O.L. (2005), “Analysis of quantitative methods of forecasting the bankruptcy of an enterprise and justification of the need to develop modern domestic analogues”, *Visnyk Ukrayins'koyi akademiyi bankivs'koyi spravy*, vol. 2, pp. 101-107.



27. Ol've, N.-G., Roy, Z.H., Veter, M. (2003), Otsenka effektivnosti deyatel'nosti kompanii. Prakticheskoye rukovodstvo po ispol'zovaniyu sbalansirovannoy sistemy pokazateley [Evaluation of company performance. A practical guide to using a balanced scorecard], M.: Williams Publishing House.

28. Grachev ,A.V. (2002), “Growth of equity, financial leverage and solvency of the enterprise”, *Finansovyy menedzhment*, vol. 2, pp. 6-21.



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