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MODEL FOR IDENTIFICATION OF POTENTIAL REGIONAL CLUSTERS

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Abstract:
This paper deals with the analysis of building up of methodology and identification model of potentials for a cluster development and for a clustering model development by using the well-known theoretical and practical experience of developed countries where clusters have become a basic stronghold for contemporary industrial and overall economic development. Moreover, it offers a simplified model for identification of key competent authorities in the regional economy based on selected criteria (revenue structure, employment structure, revenue growth index, cluster index etc.) On the basis of the defined competent authorities we can identify potential cluster development. The identification model described in this paper deals with the principles and other supporting measures needed for cluster development.

Key Words: Regional Cluster, Core Competences, Cooperation, Cluster Index

1. INTRODUCTION

In a globalize world, regional economy and companies have to be adjusted to new requirements, which can lead to an increased investment risk. However, these new conditions require a closer cooperation, not only at the global level, but at the regional levels as well. At the same time there is an increased opportunity that a country or a region participates in a joint product. It is obvious that the competitiveness of a regional company can be stimulated by different measures and, consequently, the standard of living of the population in the region will be enhanced.

Here are some of the global tendencies:

- Companies will focus on their core business.
- In a global market, there will be the companies focused on design and research of a specific product, the manufacturing companies will be concerned with its production and the commercial companies will be concerned with selling of the product.
- In order to guarantee the quality, the safety and the traceability, companies will establish strict manufacturing rules for their subcontractors.
- The sharing of the works among several companies will require networking models at a global level.
- Specialization and networking skills will be the key to SME success.
- Networking requires a permanent connection between the automatic centralized managing systems (ERP) of the enterprises.

Consequently, it is evident that a higher standard of living is not and cannot be achieved by any kind of company. It can only be achieved by the companies, whose development has been based on their adjustment to global changes, and which recognize the importance of innovative potential, not only in the sphere of new technologies, processes, knowledge and skills, but also in the sphere of new quality products, as well as the importance of networking with business partners in their environment.

It is certain that innovations have an impact on the increase of productivity within a company. By increasing its competitiveness, a company can increase its economic effect,

and, regarded from a global point of view, the employment opportunities and the standard of living will be also increased. Only innovations can ensure new jobs and, as such, they are basic prerequisite for regional and overall national economic development.

In the last few decades, development of information-communication technology has played an important role in development process, since it facilitates organizational decentralization and decision-making processes, and, on the other hand, it provides a horizontal and a vertical cooperation in a region and between particular regions (Fig. 1).

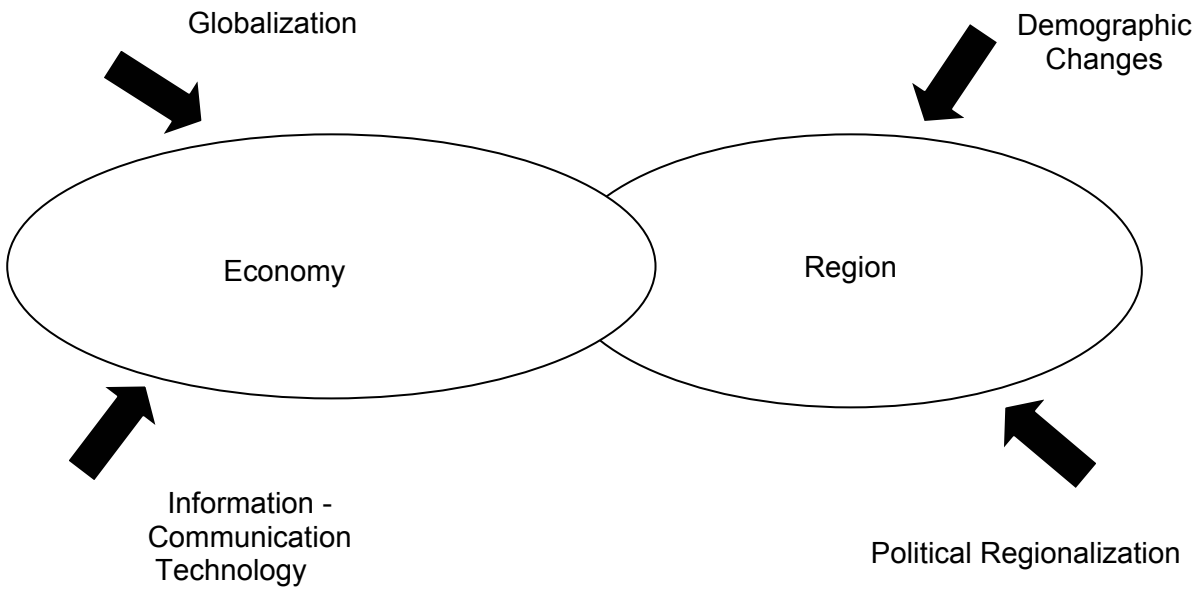

Figure 1: Main impacts on economy and region [1].

However, a quality and dynamic development is not guaranteed after the networking of a region has been done. Region must become well defined and specialized. A region without a distinctive look and quality cannot be recognized. In order to define itself a region should shape up its identity according to the medium-term regional plans taking into account the existing resources. In regard to economy, it means to concentrate on ‘basic lines of businesses, i.e. basic technologies (Fig. 2.)

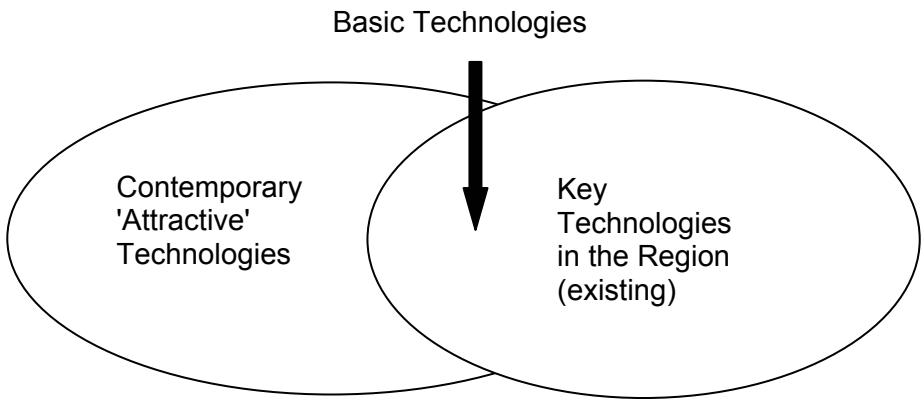

Figure 2: Basic Lines of Business [1].

According to theory, the best way to define ‘basic lines of business’ is to make a cross-section between contemporary ‘attractive’ lines of business and key technologies that already exist in the region.

It is of utmost importance to define potential regional development of 'attractive lines of businesses. It would be very favorable for the region if lines of business that are attractive in the world corresponded with the potential identified 'attractive lines of businesses in that region. In the last few years 'attractive lines of business' in the world are: Life Science/ Health Protection, Information Technology and Biotechnology. Nevertheless, they can be attractive in the region, as well, if some quantified or at least quasi-quantified criteria are satisfied. Attractiveness of a line of business is established by considering its growth in the recent period, the regional level of innovativeness in that line of business (annual number of patents per 1000 inhabitants), and its linkage with other lines of business in the region (that is, the impact the said line of business has on the growth of other lines of business in the region).

Other criteria might be:

- Profit increase,
- Sensitiveness to conjuncture,
- Environmental pollution (emission, noise, traffic congestion, polluted areas etc),
- Revenue participation in the region, etc.

Potential regional development of 'attractive lines of business' can be defined by weight factors (e.g. multi-criteria analysis).

It should be emphasized that, due to the lack of relevant information and owing to the highly demanding process of cluster formation, a simplified case study of identification of potential industrial clusters in the Split-Dalmatian County is shown here. Following the same principle, the methodology stated in the case study could be applied in identification of potentials of the whole County economy.

2. CASE STUDY: IDENTIFICATION OF POTENTIAL INDUSTRIAL CLUSTERS IN THE SPLIT-DALMATIAN COUNTY

Economy of the Split-Dalmatian County is still burdened by inherited anomalies of the previous economic system and by some transitional problems. Here are some of the most evident ones: low productivity additionally burdened by a great number of employees and by an obsolete technology; a predominant lack of products and services demanded at developed markets; Government subsidizes lame ducks; enormous foreign debt; inflationary economic policy; Government meddling with economy; neglected agriculture; uneven development of the urban and rural areas; gray economy etc. However, the privatization of the public property/companies, which is a sine qua non prerequisite for establishment of a sound market basis for a prospective growth, has not been successfully implemented. Most public companies completely disappeared in the process of privatization, and those that managed to survive, have undergone numerous recovery programs or have gone into liquidation.

In these conditions, development of small and medium-sized enterprises could not have been supported by big industrial systems; therefore economic development has been mostly turned to the service sector. Generally speaking, during the process of transition there was no development whatsoever, particularly there were no new technologies or new products introduced. Cooperation between economy and science was rather weak, and the accompanying infrastructure required to support technological development and innovations was developing rather sluggishly. Taking all this into consideration, a basic prerequisite for making a turnaround to a successful economic development in the region is to restructure its economy.

In the lack of a unique and commonly agreed economic strategy at the national level, the Split-Dalmatian County has decided to define its own goals and priorities and to develop its own potentials. As a result of this decision there is a recently brought Regional operational program [2] that defines the guidelines for the development of the County in the next five-year period.

One of the primary strategic goals, defined in ROP, is to develop a competitive, diversified, technologically advanced and environmentally sustainable economy that will be oriented to enhance the standard of living of the local population. Consequently, such a clearly defined goal requires a radical change of the existing setting, in which an inadequately competitive economy still prevails. Moreover, it is additionally burdened with obsolete technologies, insufficiently educated and unskilled personnel, particularly in the marketing and management field. On the other hand, in the places where there are some potentials, economy is not adequately integrated, the products have a rather low VAT, while the export products, excluding rather inefficient shipbuilding industry, are mainly concerned with service industries (tourism and transportation). In order to set things in motion, the following priorities have been defined:

- To strengthen cooperation between research institutions and entrepreneurship that will enable implementation of new technologies and production of technologically innovative products.
- To restructure organization in traditional manufacturing sectors, agriculture, fishing industry and tourism in order to achieve bigger competitiveness.
- To support export-oriented, specialized production of goods and services with higher VAT.
- To encourage regional and inter-regional integration processes (including transnational ones) and to support cluster organizations in order to strengthen overall synergetic impact in the sectors and between them.
- To ensure business, entrepreneurial and managing training, and
- To increase employment opportunities.

Pointing out the need for regional and inter-regional networking, integration and clusterization of County economy, is the first step that has to be taken in order to start with more intensive research that will help in identification, organization and development of the above-mentioned networks. Bearing this in mind, this paper presents a model for identification of basic technologies and potentials and for development of industrial clusters in the County.

The following parameters have been adopted in order to identify basic technologies and potentials for development of industrial clusters in the Split-Dalmatian County, taking into account some objective impediments in availability of relevant statistical data:

- Revenue structure, the share of each industry in the total revenue of County economy, shown in terms of percentage,
- Employment structure, the number of the employed in each industry as against the total number of the employed in County economy, shown in terms of percentage,
- Cluster index in CI activity [3]. This index shows how high is the concentration of some activities at the County level as against an average value at the national level. If this value is over 1, it means that the concentration of a specific activity in the County is higher than the concentration at the national level. Activities with CI > 1 can be very important for the future development of the County.

CI is calculated in this way:
(Number of companies in an activity within the County / total number of companies in the County) / (number of companies in an activity within Croatia / total number of companies in Croatia).[1]

The second measure is Revenue increase index, which shows the relation of the last year revenue compared with the revenue of the previous years.

[1] For example: (10 / 20) / (100 / 1000) = 0,5 / 0,1 = 5 = high concentration = 500 % more companies than an average number of companies in Croatia.

Table I: Activities within an industry and their characteristics.

Activity/branch	Revenue Structure (%)	Employment Structure (%)	Cluster index (CI)	Revenue increase index (%)
C Mining and excavating	**0,336**	**0,264**	**1,319**	**155,45**
14 Excavating of minerals & stone	0,336	0,264	1,319	155,45
D Processing industry	**25,098**	**31,537**	**0,859**	**104,7**
15 Production of food and drinks	4,562	5,410	1,173	115,14
16 Production of tobacco products	0,000	0,000	0,000	0,000
17 Production of textile	0,447	0,831	0,693	124,47
18 Production of clothes; finishing & dying of furs	0,374	1,470	0,539	93,04
19 Leather processing, production of fancy goods & footwear	0,087	0,178	0,660	110,65
20 Wood processing & wood products	0,138	0,276	0,436	107,55
21 Production of paper wood-pulp & products of paper	0,245	0,252	0,665	97,73
22 Publishing & printing activity	1,058	2,073	0,808	104,99
24 Production of chemicals and chemical products	0,139	0,043	0,615	305,04
25 Production of rubber and plastic products	0,743	1,255	0,852	128,49
26 Production of other nonmetallic mineral products	4,486	3,050	1,276	103,71
27 Production of metal products	0,231	0,646	0,718	78,30
28 Production of metal products, not including machines & equipment	0,802	1,581	0,743	117,83
29 Production of machines & devices	0,396	0,463	0,758	102,70
30 Production of office machines & computers	0,200	0,148	0,953	109,09
31 Production of electrical machines & appliances	0,455	0,455	0,885	133,39
32 Production of RTV appliances & communication equipment	0,129	0,160	1,001	105,72
33 Production of medical, optical and precision instruments & clocks	0,120	0,160	1,001	105,72
34 Production of motor vehicles, caravans, trailers & semi trailers	1,480	2,226	0,403	121,35
35 Production of other vehicles	8,654	10,349	2,127	95,61
36 Production of furniture	0,303	0,484	1,073	115,02
37 Recycling	0,051	0,042	0,881	150,36
E Electrical, Gas & Water Supply	**0,878**	**1,386**	**0,669**	**119,35**
40 Electrical & gas supply of steam & hot water	0,008	0,016	0,440	100
41 Collection, purification and distribution of water	0,870	1,369	0,810	118,82

The basic data and parameters shown in Table I are calculated for the following industrial activities and for their particular branches:

- Mining & Excavating,
- Processing Industry,
- Electrical, Gas and Water Supply.

In addition to the data from Table I, the basic activities are defined by analyzing the position of an industrial activity in a quarter of the quadrant shown in Figure 3. A measure adopted for the size of an activity in the County, is “share of the revenue structure of an activity compared with total revenue in economy” on the abscissa, and a measure adopted for a degree of the activity expansion is “number of entrepreneurs” (small = from 0 to 50; big = more than 50 enterprises in each activity).

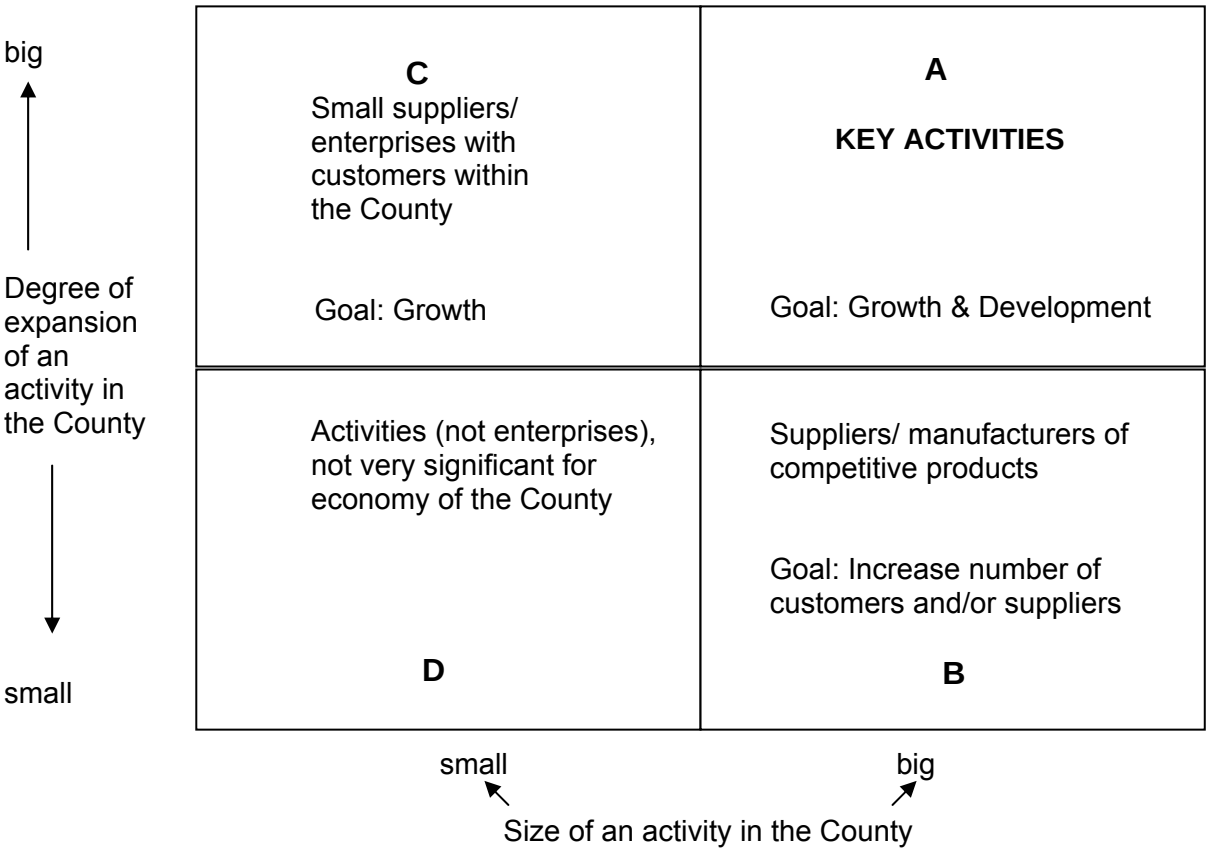

Figure 3: Defining key activities.

On the basis of the data from Table I, and on the position of the activity in Fig. 3, two basic industrial activities have been defined (quarter A), which are considered to be the most significant for development of the Split-Dalmatian County at the moment. They are:

1. Production of other vehicles (The Split Shipyard, the Trogir Shipyard, Brodoremont Vranjic etc.)
2. Production of food and drinks (Prerada, Dalmesso, SMS, Dalmacijavino, Coca Cola etc.)

The quarter B includes the activities/enterprises with high percentage of revenue structure in the County economy, but there are very few of them. They deal with production of motor vehicles, caravans, trailers & semi trailers, and production of other nonmetallic mineral products. The goal of these enterprises should be an increase of the number of customers at the home and foreign markets.

On the other hand, the quarter C includes the activities/enterprises with rather low percentage of revenue structure in the County economy, but they are rather spread. These

enterprises could easily increase their percentage of revenue by networking in clusters. In this way they will be able to grow and develop. They include:

- Publishing and printing activity,
- Production of metal products, not including machines & equipment,
- Production of furniture,
- Production of rubber and plastic products.

All other activities (17 out of total 25 industrial activities) are in the quarter D at the moment, and they are of a very small significance for the economy in the Split-Dalmatian County.

3. CONCLUSION

In this paper we have tried to emphasize the need for identification of an actual development potential in the regions where economy has been affected by the processes of transition and restructuring. We have used theoretical and practical experience of developed countries, in which the model for networking and clustering is based on innovative potential and on knowledge-based economy, which is a basic stronghold of both contemporary industrial development and overall economic development.

Strategic goal of regional development is to provide conditions for innovations based on regional identity. However, in order to achieve this goal it is necessary to do the following:

- To ensure transparency with regard to the existing technological competence,
- To link regional resources and competent institutions (universities, institutes, enterprises, chambers of commerce etc.)
- To identify the existing potentials for development of clusters in the context of development of attractive regional lines of business,
- To establish new cultures of regional exchange of knowledge and experience.

Therefore, it is necessary to make a transition from the regional strategy based on predominantly industrial production to an economic development strategy based on knowledge. Linkage of economy, scientific institutions and regional management can be achieved by using a triple helix model, which provides required prerequisites for the transition of a society towards knowledge. In order to redefine the interrelationship between institutional knowledge, economy and regional management, it is of utmost importance to enhance the local conditions for development of innovative processes by linking together research activities with others. The aim is to continue this preliminary research and to develop such models of linkage.

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