FACTORS WHICH CONTRIBUTE TO CLUSTERING PROCESS

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ABSTRACT:

To start a real prospect of success strategy , has become increasingly clear that companies need to participate in clusters, networks, alliances and collaborations, to reduce the risks of any kind. In this context innovative regional clusters is a step forward, as it ensures economic growth through regional and national companies interrelation of cluster components at a high level, leading them towards functioning in an integrated system.The paper is based on a study that outlines the importance of the equilibrium of key success factors related to clustering process. The survey and interviews, adopted as research techniques, indicates that there are two main groups of factors hard success factors (knowledge, institutional support and management) and soft success factors (education and human resource development and entrepreneurial behavior) which can contribute significantly to foster any clustering process. The empirical study was based on a questionnaire which was sent to the members of Transylvanian Furniture Cluster witch has 34 organizations as members,21 manufacture companies . The cluster has been established in 2012 as an innovative cluster .Topics of interest for cluster include: increasing interaction between companies, academic institutions and other entities involved in supporting the furniture industry; increasing the economic influence of the cluster in the furniture production sector; active involvement at a legislative level, initiating project proposals and undertaking the following projects, developing strategies on a local, national, and international level; initiating strategic partnerships both on domestic and on foreign markets, with the goal of increasing cluster dimensions.

***Keywords*:** key success factors, clustering process, factors correlation, Transylvania Furniture Cluster.

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1. Introduction

In recent years, many studies have appeared on the analysis of the role clusters, both in developed countries, especially in high technology sectors, and in developing countries, where clusters can become tools for increasing the competitiveness of companies and provide a better international positioning for the region/country. (Ketels et al., 2008). Most work regarding clusters refers to the theory of location (Porter, 2000), (Krugman, 1991) or of conditions that favor the emergence of clusters in certain regions and countries (De Miguel-Angel, 2009). A review of the literature reveals two main lines of study: analysis of the cluster formation process and its dynamism, and the effect of clustering on business competitiveness. In terms of methodology for the analysis of clusters the literature shows a few basic trends. Another variant exploits the benefits that cluster members can get as an effect of agglomeration. In this research on clusters, a central pillar is the social aspects, in particular networking processes. The conclusions that can be drawn after studying these two aspects of the research manifest in two derived trends: (a) cluster analysis which focuses on hard which influence the enterprise in the process of building a competitive advantage (Porter, 1998); (b) cluster analysis which focuses on social factors that increase the need and opportunity of network and learning processes. (Rašić-Bakarić, 2007)

Regardless of the approach, the foundation of implementing clusters consists of organizational learning capacity and transfer of know-how, which are manifestations of a knowledge-based society, which can easily find practical application, following the adoption of such investment strategies. Without being in a relationship of subordination or dependence from each other, companies tend to combine complementarity advantages, which they possess in order to increase the competitiveness of their products, both domestically and primarily on external markets, the goal being a synergy effect.

The resources involved in the clustering process may be human, social, physical and organizational.

In the increasingly integrated and holistic economic concept of training, in the current process of formation, consolidation and development of clusters, we do not necessarily try to preserve a balance between the economic and the human side of the cluster.

2. Type of factors involved in the success of the clusters

Numerous recent empirical studies reveal through a smart combination as hard and soft factors we can find the key to success within any cluster, reducing threats and maintaining a favorable position. We can therefore define two sets of success factors in the clustering process: Hard factors and Soft factors (Figure1.) Each of these forces are powerful sources of change and individually contribute to the overall goals of the cluster.

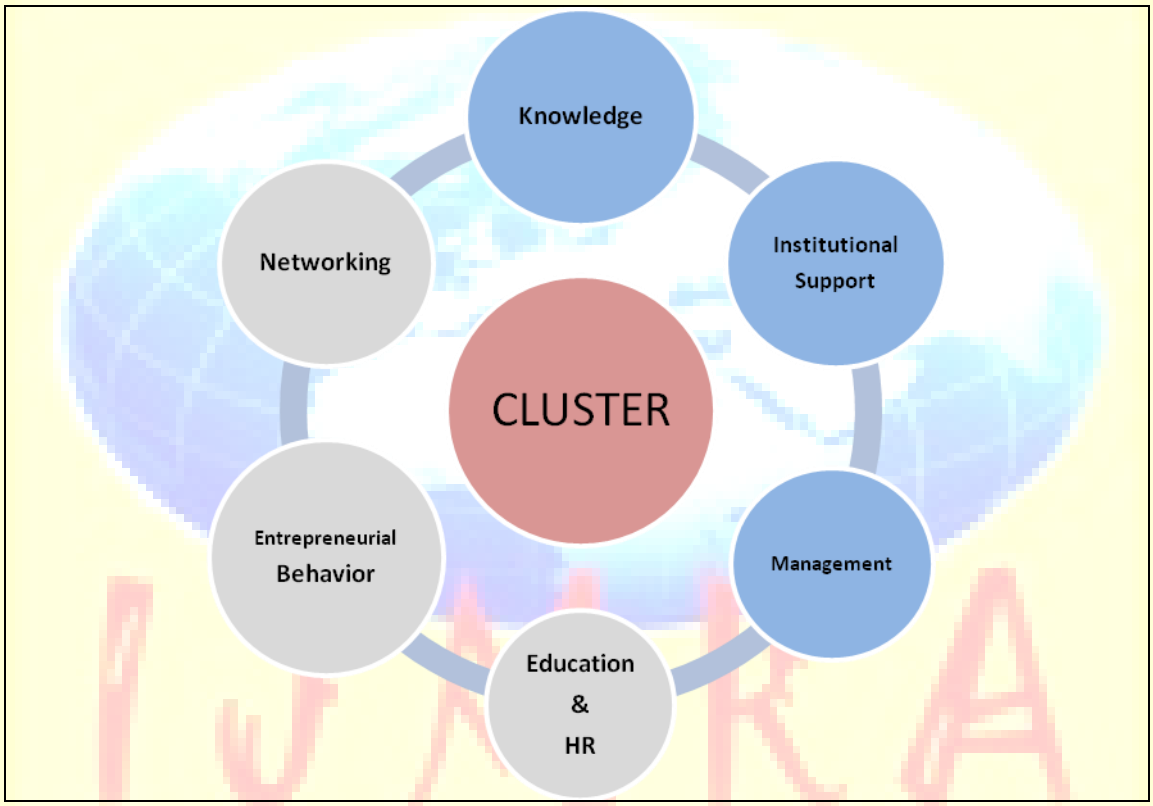

Figure 1. Success factors in clustering process

Hard factors

2.1. Knowledge

We live in an information society where knowledge has become the key factor of production, being the key element of economic competitiveness at organizational, national and global level. Currently, world states and most organizations are aware that the generation and exploitation of knowledge are essential factors, vital sources of global wealth growth. Consequently, the major

concern of clusters in particular, is the systematic generation of knowledge through the development, in this regard, of effective management systems.

Belonging to an innovation cluster becomes a real advantage for small and medium companies because of quick and easy access to research results in order to implement them in production and the realization of innovative products, advanced technologies, and because of common development strategies, starting from production cooperation, acquisition of technology and advanced equipment designed for common use, and also marketing strategy (Popa et al. 2013,).

This process should be continuously and permanently improved. Knowledge is based on information. The result of their combination is a formidable weapon (Figure 2.).

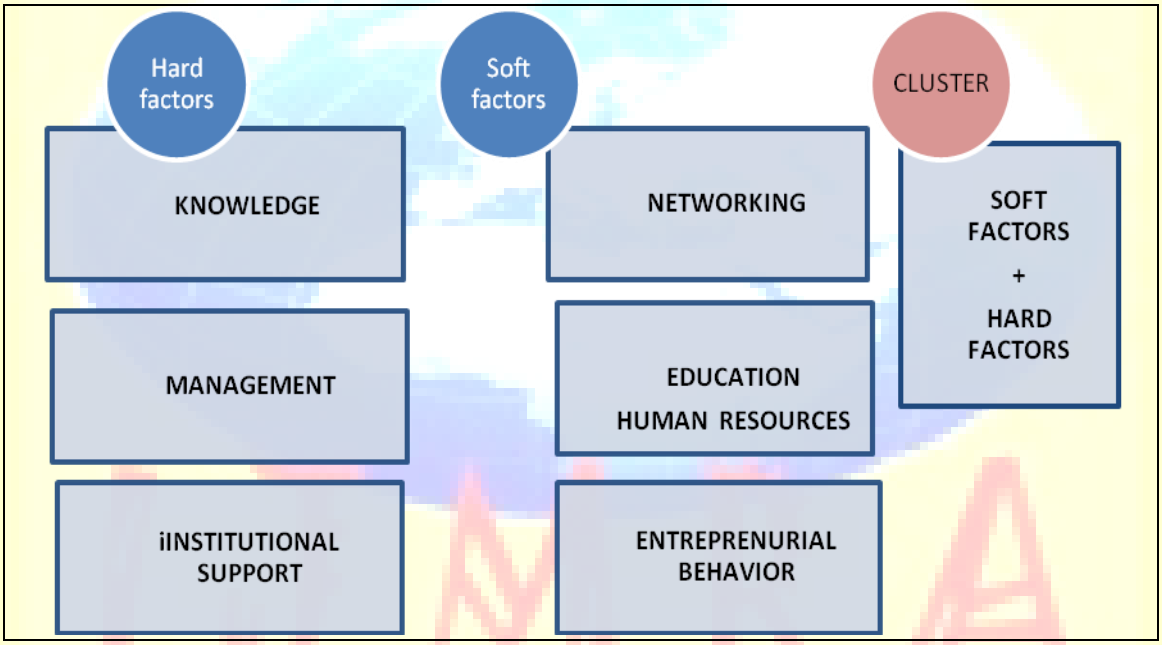

Figure 2. Hard and Soft factors in clustering process

The main advantages:

Due to easier access to a wide range of information, knowledge, market analysis and contacts, clusters generate an environment that facilitates innovation. However, the competitive pressure created by companies of the same kind constitutes a permanent incentive to improve processes, technologies, products and services offered by each company within the cluster. In addition, geographical proximity facilitates the uptake of new ideas and innovations in terms of

technologies, products and services from one firm to another, contributing to a rapid spread of best practices. Clusters facilitate the innovation process of companies by:

• Improving the ability of firms to perceive opportunities for innovation by facilitating contacting of sophisticated clients and establishing long-term business relationship with them, allowing supplying companies to quickly become aware of market needs, technological developments, the availability in production equipment, the offer of new products and services, and the innovative concepts arising in marketing;

• Providing facilities to be in permanent contact with numerous companies and institutions gives companies the ability to quickly supply themselves with what is required;

• Creating a competitive environment encourages companies to respond with innovation to competitive pressure and the comparisons that are consistently made among firms in a cluster;

• Facilitating experimentation at lower costs - compared to the situation of a company that would try experiments in isolation; as a result of collaboration between companies and the availability of local resources, the cluster provides more favorable conditions.

Interest in innovation and technological externalities created can help improve long-term competitiveness and ensure the sustainability of local businesses. Externalities may involve direct forms of cooperation (facilitated by meetings between buyers and sellers, or by linking companies using the same technology and the same occupational categories of employees, without being in direct competition), or indirect forms of cooperation (facilitated by professional associations, chambers of commerce and other organizations).

Knowledge resources suggest the ability to organize, to create and use knowledge in order to serve as a source of sustainable differentiation, with general application (Hahn, 2007).

Knowledge management is considered to have the ability to increase:

- the competitive advantages of the cluster,
- the cluster's innovation ability to uncover necessary opportunities.

In conclusion, there is a relationship between knowledge and the innovation process, the knowledge base represents unique resources for radical innovation.

2.2.Institutional support

The regions can guide their principles of organizing the development based on cluster-like associations. The limits or constraints for activating the participation in a cluster mainly depend on the connections of access to social resources.

The connection agents that have to operate as open gates towards information, know-how, labor, are represented by the brokers of the activity of network creation and the negotiators of collectively planning the actions performed by the companies of goods or services.

They can more easily identify the measures concerning the optimization of the entire process of cluster forming and development, whose conception they were involved in.

This is why regions and localities should have a greater responsibility in creating the conditions favorable to clusters. In this case it is necessary to redefine the various governing levels.

Thus, while the basic objective of the national government should be to create macro-economic conditions, offering a positive economic climate, the role of regional government should be to focus on infrastructure, education and professional training.

In the same time, the task of the local government is to ensure the placements and associated services.

Thus, the national, regional and local governments can each contribute distinctly to the positive political environment requested for the successful development of the region, having as result the economic improvement and the development of SMEs.

A recent paper of OEDC (2013) mentions the following priority elements:

- Facilitating the establishment of local partnerships, involving private companies, non-governmental organizations and various levels and sectors of public administration.
- Stimulating the private sector towards the initiation of leadership and development of clusters, in which the public sector would have a catalyzing role.
- Placing initiatives at the most appropriate governing levels.
- Selecting a portfolio of clusters grouped by geographic areas, which present the best opportunities for immediate regional development, with respect to the existing resources.
- Facilitating the development of networking among the components of the cluster and the public authorities, with the purpose to foster the cooperation between them.
- Specifying a realistic deadline, required for covering the business development programs in the area.

- Establishing the funding levels for launching the organization of the cluster and the feasibility studies.

The association within clusters based on very well established functioning rules and criteria can define the role of each component, for a long period of time, thus ensuring the frame for its specialization and obviously for increasing the competitiveness of the cluster.

2.3.Management

At the same time, we can talk about a management of clusters, and experts are in the process of identifying the skills and competencies necessary for successful management. The main challenges of an efficient management and organization of the cluster relies on the advantages of diversity and complementarity of the cooperation between members of the cluster cumulated with the intense cooperation between the activities involved. These are features largely similar to those of large organizations. The main of clusters is flexible organization, each company carrying out certain activities according to market demands and cluster strategy. The cluster is also the ideal setting to present a lot of companies under the same brand, as a common marketing policy to harness resources and shared competence.

The concept of regional cluster brand is expanding rapidly; this brings advantages by bringing the individual brand closer to that of its members. (Kaminski, 2009). We mention here another platform created by the European Commission, namely www.cluster-excellence.eu. This platform is aimed at cluster managers and aims to support interaction and cooperation between clusters, to increase competitiveness.

Soft factors

2.4.Education and Human Resources Development

A continuous process of recruitment of specialized human resources takes place in the cluster, helping them identify people with the skills required for the innovation process, i.e. the outcome of the innovation cluster. The cluster introduces a new type of company culture, that goes beyond the company borders and is based on a series of values of which the most important is innovation. Specialized training in the cluster appears as a continuous process, which is a key

condition to strengthen and develop it and it is supported both by businesses and by specialized institutes. Thus, the cluster can have staff with general experience but also specialists, which gives a certain stability of employment and even a better delineation of tasks. An important role is played by specialized knowledge, innovative business ideas and technological knowledge in the cluster. (Martin-de Castro et al, 2013), (Tödling et al.2004). Clusters promotes learning processes and skills development (Anderson et.al, 2004), (Lundvall, 2003). They are attractive to companies with the same profile, or to those which relate to the activity in question, precisely because newcomers are keen to exploit the common basis of knowledge already present and take part in interactive learning processes that occur in a cluster. From this point of view, clusters highlight two realities:

a) skills are created over time, by interactive learning, which requires proximity;

b) skills are strictly localized, being embedded in people, organizations, networks, and some of this knowledge is tacit and therefore difficult or impossible to separate from the cluster.

The links established between the organizations belonging to a cluster allow each of the participants to be more productive and innovative than he would have been if he had remained in isolation. (Ketels, C. 2004):

2.5. Networking

The companies within a cluster and the relationships among them - is another area of the variety of contexts, from one cluster to another (Lut, 2012). Some clusters are dominated by small firms that subcontract activities between themselves. In other cases, subcontracting systems may develop around one or more larger contractors. Sometimes one or more transnational companies, or industrial conglomerates, are present in clusters, with suppliers from the firms of different sizes existing there. Sometimes, the cluster is dominated by SMEs, which are specialized in narrow market segments. Although between similar firms a competitive-type background remains, also a parallel phenomenon of development of relations occurs between them in fields that ensure an increase of competitiveness for all involved. This is materialized in the creation of consortia, supply chains or networks of firms, which include essential information flows for achieving mutual trust and better overall coordination. Relationships of trust are the foundation

of greater capabilities of association between cluster firms. It has become increasingly clear that companies need to participate in networks, alliances and collaborations in order to reduce the cost of technology transfer.

2.6. Entrepreneurial Behavior

More than 75 % of cluster's members from Romanian Clusters are established from SME's. The entrepreneurial behavior is a leading management.(Wennberg et al., 2008). The organization culture bears the imprint of a proactive behavior performed by the main components companies' managers themselves . This requires taking risks, identifying and valuing rapid business opportunities, induction of team spirit, innovativeness, etc.

3. Empirical study

The empirical study performed by the authors was based on a questionnaire which was sent to the members of Transylvanian Furniture Cluster with an association of 34 organizations ,21 manufacture companies that have established the cluster in 2012. Eighteen companies responded to the survey. Further information necessary to evaluate the study was obtained through interviews of managers.

Sampling was purposive; only those managers who had been included in the clustering process from the very beginning were interviewed. In the study, the respondents were asked to indicate how much importance had been given to each of six success factors in the clustering process. The responses were recorded on a standard Likert scale from (1) = no importance, (2) = low importance, (3) = moderate importance, (4) = high importance to (5) = very high importance. The study shows that TFC cluster members are paying more attention to soft success factors and believe they are more important for overall success of the cluster than hard success factors.

Table l: Key success factors according to average grades

Factors	Mean	Std. Deviation	N
Hard factors	**4,277**		
Knowledge	4,3889	,84984	18
Institutional support	4,3333	,59409	18
Management	4,1111	,67640	18
Soft factors	**4,5778**		
Education	4,3667	,78591	18
Networking	4,8111	,69780	18
Entrepreneurial behavior	4,5556	,61570	18

3.1. The analyze of correlation between the Factors

The study ,suggests that key success factors differ in their importance for individual companies, but all six success factors are considered relevant for the success of cluster. Thus the average of soft factors is slightly higher than of the hard factors. That indicates that the firms which participated to the survey are more confident in the success of the cluster by developing more trust, more skilled personnel, sharing experience ,good practices. In order to analyze the date provided in sample we can consider simple linear regression and Pearson's correlation.

Pearson's correlation coefficient when applied to a sample is commonly represented by the letter *r =sample correlation coefficient* or the *sample Pearson correlation coefficient*. into the formula The formula for *r* is:

$$r = \frac{\sum_{i=1}^{n}\left(X_i - \bar{X}\right)\left(Y_i - \bar{Y}\right)}{\sqrt{\sum_{i=1}^{n}\left(X_i - \bar{X}\right)^2}\sqrt{\sum_{i=1}^{n}\left(Y_i - \bar{Y}\right)^2}} \quad (1)$$

An equivalent expression gives the correlation coefficient as the mean of the products of the standard scores. Based on a sample of paired data (X_i, Y_i), the sample Pearson correlation coefficient is

$$r = \frac{1}{n-1}\sum_{i=1}^{n}\left(\frac{X_i - \bar{X}}{s_X}\right)\left(\frac{Y_i - \bar{Y}}{s_Y}\right) \quad (2)$$

Where: $\bar{X} = \frac{1}{n}\sum_{i=1}^{n} X_i$ (3)

and

$$s_X = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}\left(X_I - \bar{X}\right)^2} \quad (4)$$

are the sample mean and sample standard deviation, respectively. Thus, the first parenthesized term in the previous summation is the standard score. (The terms for *Y* are similar.)

The correlation coefficient ranges from −1 to 1. A value of 1 implies that a linear equation describes the relationship between X and Y perfectly, with all data points lying on a line for which Y increases as X increases. A value of −1 implies that all data points lie on a line for which Y decreases as X increases. A value of 0 implies that there is no linear correlation between the variables.

More generally, note that (Xi − X)(Yi − Y) is positive if and only if Xi and Yi lie on the same side of their respective means. Thus the correlation coefficient is positive if Xi and Yi tend to be simultaneously greater than, or simultaneously less than, their respective means. The correlation coefficient is negative if Xi and Yi tend to lie on opposite sides of their respective means.

Data gathered from the questionnaire were introduced in the SPSS software.

First a bivariate correlations procedure has been performed, which computes the pairwise associations for a set of variables and displays the results in a matrix. It is useful for determining the strength and direction of the association between two scale or ordinal variables

Then a Paired-Samples T Test procedure was used to test the hypothesis of no difference between two variables. The data may consist of two measurements taken on the same subject or one measurement taken on a matched pair of subjects.

Additionally, the procedure produces:

• Descriptive statistics for each test variable

• The Pearson correlation between each pair and its significance

• A confidence interval for the average difference (95% or a value you specify)

The study of correlation (Pearson Corr. > 0,3) between hard and soft factors suggests that there exist both negative and positive correlations (Table 2). For example, Knowledge has a negative correlation to Networking, the higher the value of knowledge, the lower the Networking value of and vice versa.I t shows that there is lack of collaboration between cluster members, exchange and flow of information, creative groups(generation of innovative ideas) or best practice hubs. A positive correlation can be observed between Networking and Entrepreneurial and Education and Knowledge.

The most significant positive correlation is between Management and Institutional Support .It indicates that these factors lie on the same side of their respective means and it is obvious that governmental policies and institutional aid foster the administrative strategies of the cluster.

Table 2. Correlations

FACTOR		Knowledge	Institutional support	Management	Education	Networking	Entreper Behavior
KNOWDLEGE	Pearson Correlation	1	,194	-,080	,161	-,424	,125
	Sig. (2-tailed)		,440	,754	,522	,079	,621
	N	18	18	18	18	18	18
INSTITUTIONAL SUPORT	Pearson Correlation	,194	1	,488*	-,126	-,095	-,054
	Sig. (2-tailed)	,440		,040	,618	,709	,833
	N	18	18	18	18	18	18
MANAGEMENT	Pearson Correlation	-,080	,488*	1	-,148	-,028	-,016
	Sig. (2-tailed)	,754	,040		,559	,913	,951
	N	18	18	18	18	18	18
EDUCATION	Pearson Correlation	,161	-,126	-,148	1	,340	-,203
	Sig. (2-tailed)	,522	,618	,559		,168	,420

	N	18	18	18	18	18	18
NETWORKING	Pearson Correlation	-,424	-,095	-,028	,340	1	-,015
	Sig. (2-tailed)	,079	,709	,913	,168		,952
	N	18	18	18	18	18	18
ENTREPR. BEHAVIOUR	Pearson Correlation	,125	-,054	-,016	-,203	-,015	1
	Sig. (2-tailed)	,621	,833	,951	,420	,952	
	N	18	18	18	18	18	18

*. Correlation is significant at the 0.05 level (2-tailed).

4. Conclusions

That paper it is focused on furniture industry, an important sector in our country which is unable to achieve economics scale, logistics and technology innovation. The flexibility for a regional specialization of interdependent firms and their cooperation with other public and private institutions will create the synergies, increase the productivity and lead to economic advantages for the region. The study suggests that the six key success factors which were tested .These factors differ in their importance for individual companies in the sample. All of the tested success factors are considered relevant for the Clustering performance. The study also suggests that soft success factors (response grade average is 4,577) are considered more essential than hard success factors (response grade average is 4,277) to increasing the success rate of corporate combinations. Every member of the cluster has a major interest in creating value with clustering process, but a new integrated approach is required in order to enhance success rate. Transylvanian Furniture Cluster is a recently created cluster which has to take into account that an important reason contributing faster clustering process lies in the integrated approach of balanced management of hard and soft success factors , which are essential for success of any business combination. The study indicates that managers of TFC see are not entirely confident in the actual management and organization of the cluster .Immediately operational decisions have to be implement as solution to mitigate risks. As well as a better lobby of the governmental institutions is required ,mostly as an effective tool of promotion the Cluster on national and international mediums. The integrated approach makes clustering work better as it combines

economic performance with non-economic (soft) factors. In Romania ,cluster based national policy has been established o few years ago. The clustering process is still in the emerging phase. No relevant conclusions can be taken if clusters actually have reached their desired strategic or financial objectives. Yet, cultural differences, management deficiencies, lack of communication, poor business fit, among others, are all closely aligned with less actual members value than initially planned.

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