Uml Language Use in Identifying Tangible and Intangible Assets in a Cluster

Authors:　　**Claudiu Pîrnău**, Ph.D. Student at "Lucian Blaga" University of Sibiu, claude.pyr@gmail.com, **Anca Ioana Vlad**, Ph.D. Student at "Lucian Blaga" University of Sibiu, ankavld13@yahoo.com

Clusters contain a group of related industries and other entities important in terms of competition and are geographic concentrations of interconnected companies and institutions belonging to a particular area. These include suppliers of specialized inputs such as components, machinery and services, and providers of specialized infrastructure. Clusters often extend downstream towards various distribution channels and customers and later to manufacturers of complementary products and the industries related by skills, technologies or common inputs. Finally, some clusters include governmental institutions and other entities - such as universities, standardizing agencies, think-tanks (ideas factories/ reflection groups), professional training providers and employers - providing specialized training, education, information, research and support.

Keywords: regional innovation cluster; tangible and intangible; case diagram; UML.

Introduction

Innovative regional clusters are a higher stage of evolution of the cluster concept as they provide regional economic growth by promoting innovation (J. Engel, S., Del Palacio I., 2009, 495). Innovative clusters are no longer defined by an agglomeration contributing to industry specialization, but the

stage of development and business innovation. Innovative clusters are evaluated through intangible assets such as information, including knowledge and intellectual capital that facilitate accelerating innovation by creating start-ups and spin-offs. So, we consider entrepreneurship as a key competence of innovative clusters.

A new configuration of innovative clusters will incorporate the concept of cluster with the networks within networks of innovation clusters, which will extend cooperation between innovative organizations in different regions.

Think Tank is a term that characterizes an association or organization of specialists or even one competent person who offers free information needed to create, enhance, diminish, eliminate, organize or optimize a specific functional department of the company, such as the streamlining of military, economic, political, cultural, local, regional, state, continental or even global structure [1,3].

A network of sustainable SMEs is based on: alliances between SMEs with identical/related activities; alliances between SMEs, schools, training providers (LLP) and territorial administrative units, after clusters model, including the achievement of "ideas factory", so-called "think tanks"; telework and virtual teams development (especially in rural areas and small towns); maximum use of capacity / services offered by business incubators; environmental awareness of employees; a horizontal organizational structure (generated by the reduced number of employees).

Analysis of tangible and intangible components

It is known that in practice within firms tangible and intangible components create added value. The market value of a company is influenced by summing not only fixed and mobile assets, as accounting to records, but also by company's history, its attitude towards customers and employees, potential development and innovation of products/services, by impact of the company on environmental factors, innovative attitude of the company etc.

Generally, traditional accounting focuses on the recording and interpretation of financial data in the records. In accounting flow of non-corporate assets indicates the share of intangible assets from the total assets, indicating to the company the value of research and development costs, expenses of issuing and selling of stocks and bonds, etc. These intangible

assets can be measured, but in a company there are other types of intangible assets that cannot be measured, such as base of base value, costs of impact studies, etc. In practice it was found that for an efficient management of the company, it is necessary to identify, quantify and assess all intangible assets [4].

Following research in some Romanian firms, we identified the following intangible elements that need to be taken into account under penalty:
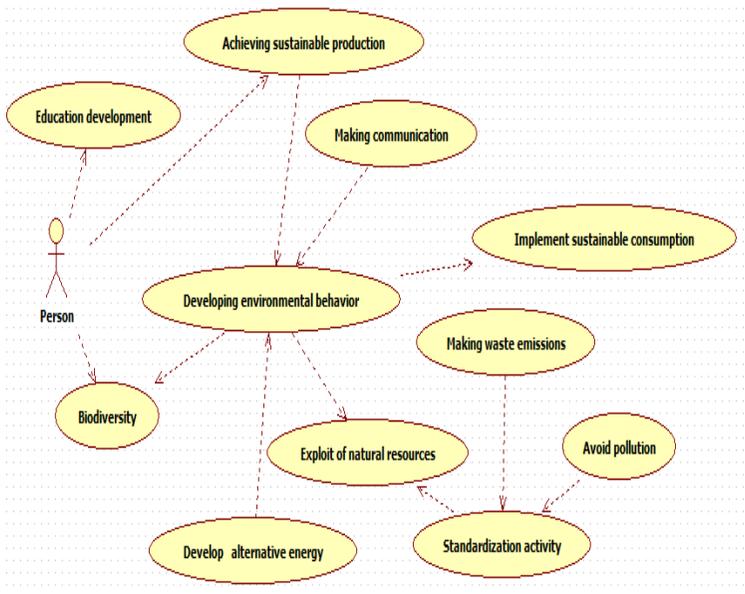
- attitude towards the environment;
- attitude towards customers;
- attitude towards employees;
- Managerial style approach to all levels of the company.

All these factors can contribute, both on long term and short term to creation of added value, increase profits, lower costs and increase the value of the company stock price. Using computer techniques to quantify intangible assets of a company, we use UML schemes to implement cases diagrams and activities diagrams [2, 5].
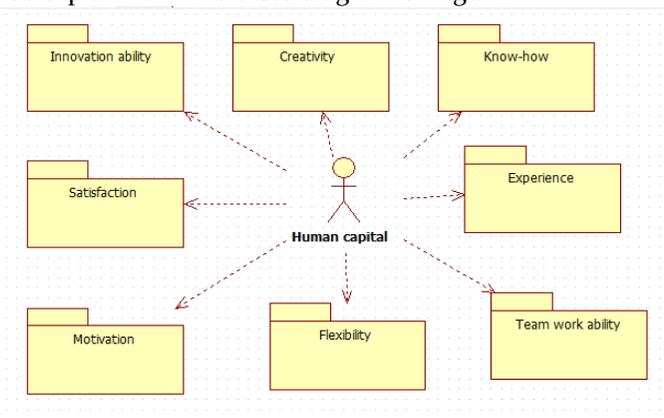
Cases diagrams

In practice there may be different links describing the collaboration between actors and used cases. An actor can work with more cases, it addresses to other services of the system. UML language contains several standard types of relationships between actors and use cases, which are: the relationship of association (association relationship), relationship expansion (extend relationship), the relationship of generalization (generalization relationship) and coupling relationship (include relationship) [8].

In practice it was found that there are intangible creative sources of added value in each business, such as: brand value (Brand value), initiatives, reputation, legal obligations, and social responsibility to employees. Customer relationship management, care on the identification, retention and motivation of its performing employees; concern for public image of the organization, be it to the public, NGOs, local communities etc.; responsible marketing of own products; proactive attitude stemming from initiatives that go beyond legal requirements, etc. Case diagram for the attitude towards the environment is shown in Figure 1.

Figure 1: Case diagram for the attitude towards the environment

Analysis of human, structural and relational capital using cases diagrams. Human capital is defined as the totality of knowledge, skills, experience and abilities acquired over time by each employee [5, 6]. These elements may belong to one or more individuals, the main elements of this kind can be explained in the cases diagram of Figura.2

Figure 2: Case diagram on human capital

Structural capital is the "sum" of information and knowledge gained at the end of the workday by an organization. This includes procedures, methodologies, databases and their company systems. Relational capital occurs in an organization based on communication, access to information, and refers to all resources through which it interconnects with other firms, customers, suppliers, communities, municipalities generally "stakeholders" - factors interested in a way or another in the fate of the organization.

## Use activity diagrams to implement a regional innovation cluster

To implement a regional innovation cluster using UML activity diagrams, I identified key activities necessary for its implementation, as shown in Figure 3. Detailing these activities, together with appropriate subtasks, are summarized in Table 1.

Table 1: List of the main activities for the implementation of an innovative regional cluster

| Nr. Crt.	Activity / subactivitis
1	**TIC Activities**
1.1.	Establish necessary forms for statistical studies in the field
1.2.	Identification of participants (partners)
1.3.	Making software and databases
1.4.	Making a total of two web pages
1.5.	Sharing knowledge
1.6	Selling knowledge and making lobby
2	**Agricultural activities and / or their related**
2.1.	Inventory of small producers / artisans
2.1.1.	Farms with SME status

Nr. Crt.	Activity / subactivitis
2.1.2.	Farms without SME status
2.2.	Identifying households / farmers' associations that can carry internships
2.3.	Making practice contracts with individual households / agricultural associations
2.4.	Introducing in electronic format of acquired knowledge. Example: horticulture, animal husbandry, vegetable, poultry, traditional manufacturing, etc..
3	**Tourist /agro-tourist activities**
3.1.	Identify measures that can lead to the achievement of sustainable tourism
3.2.	Promote and share the knowledge gained during internships. Example: use and conservation of food from organic / alternative and / or permaculture farming
3.3.	Creation and promotion of a regional brand
4	**Activities within the cluster on economic growth through intangible assets**
4.1.	Contracts on competition. Example: cluster members will apply a 15% discount and preferential payment rates (adding a total of 6 to 12 additional installments), for all other partners (training, sale of tractors, trucks, minibuses and vans "Renault" brand; advice on sustainable development at local / regional level)
4.2.	Voluntary agreements concluded between pupils / students and corporates in Dâmboviţa County, namely in South-Muntenia
5	**The sponsorship of contests / Olympiads for pupils and students**
5.1.	Implementation and / or selling of their peak achievements

Nr. Crt.	Activity / subactivitis
6	Sponsorship of cluster members children's extracurricular activities for a better vocational guidance and broadening of cultural horizons. Examples: tourist activities, visits to industrial, cultural, agricultural, research institutions, etc..
7	Identification and development of new occupations needed in the labor market
8	Promoting a legislative proposal, after the American model whereby agricultural land that has not been used for three consecutive years owned by natural or legal persons will be expropriated and will become the property profile schools.
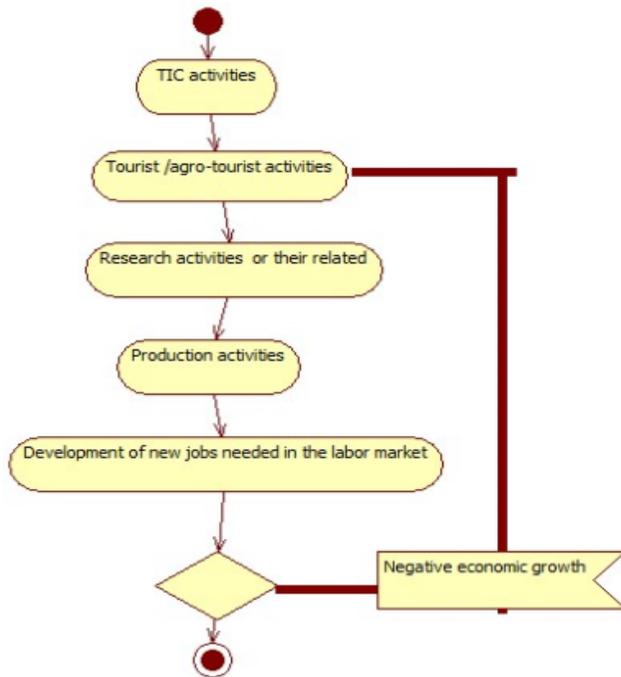
Figure 3: Activities diagram for the implementation of a regional innovation cluster

Identification of intangible assets within a cluster must be based on cases diagram in Figure 4. It is noted that any organization should have a sustainable development strategy needed to increase its value [7, 9].
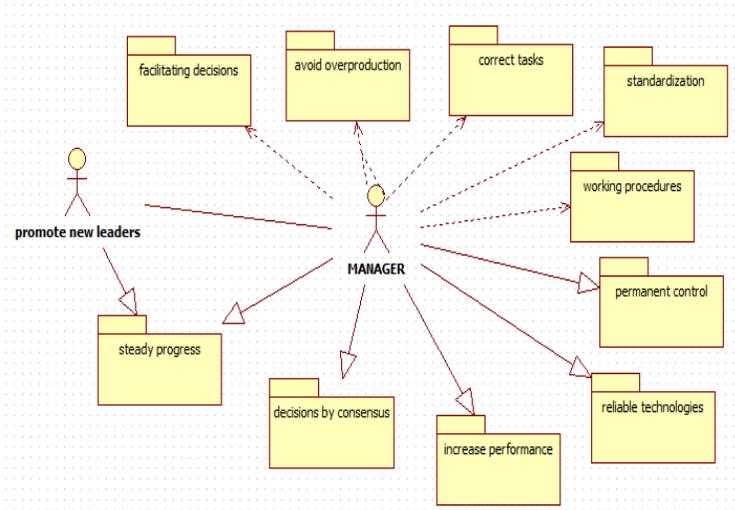
Figure 4: Diagram to identify intangible values of a regional innovation cluster

Using the class diagram for intangible managerial aspects belonging to the cluster

At the basis of performing management, to administrate tangible and intangible values of a cluster, are: couple leadership-management, organizational structure and relational capital. Couple leadership-management encompasses an organization's strategy and its implementation, transparency, communication, the total expenditure etc. Organization structure includes technologies and internal processes, human capital, importance of workplace innovation, intellectual capital, adaptability and accountability. Relational capital must necessarily include the value of the organization's products, tradition/reputation of the organization, various alliances and networks of other bodies the organization belong to, knowledge of disturbing factors and their quantification[10].

So far there have been no standards, regulations, or other methods necessary to achieve the above reporting on intangible assets. The only intangible components accounted are those accepted by IAS and IFRS (IAS, 2011; IFRS, 2011), which refer to:

- expenses related to the purchase and use of franchising, technology and trademarks;
- research and development expenses;
- Goodwill.

IAS and IFRS regulations require that "goodwill" be made explicit in the accounting systems used, thus being able to justify why a company may acquire another company at a higher value than its physical, material value. In practice, Goodwill can be negative if the company does not have a market value to cover its assets. We find that, after identifying intangible components across the enterprise, there can be achieved an analysis of environmental costs, identifying, where necessary, establishment of their intangible, respectively, tangible nature [12].

For the cluster analyzed, intangible managerial aspects include: attracting and stimulating the most competent employees; identifying employees who can help the company in dealings with various companies; employee satisfaction and creating a corporate spirit and their pride of belonging to that firm[11]; relations between employees follow a strict hierarchy and fair relations between employees should be friendly, open and sincere; communication is encouraged from management to employees and vice versa, there is a rigorous system to provide information to employees, which is respected by everybody; incorporate technologies and new ideas; identifying employees' concerns during leisure time; employees respect and nurture company's traditions; increase product quality and environmental compliance; customer satisfaction; financial relations/activities must be strictly observed; survival of the organization depends on the quality of product/services; protection of ideas and products through patents and trademarks; employees' morale must be high; identification and detection of competition's intentions; compliance with organization and hierarchy in society; encouraging employees' initiatives; lifelong learning must be paramount; survival of a cluster depends on investments in research development. Intangible managerial aspects can be grouped into categories, using UML class diagram, in order to bring value to innovation cluster, as shown in Figure 5.
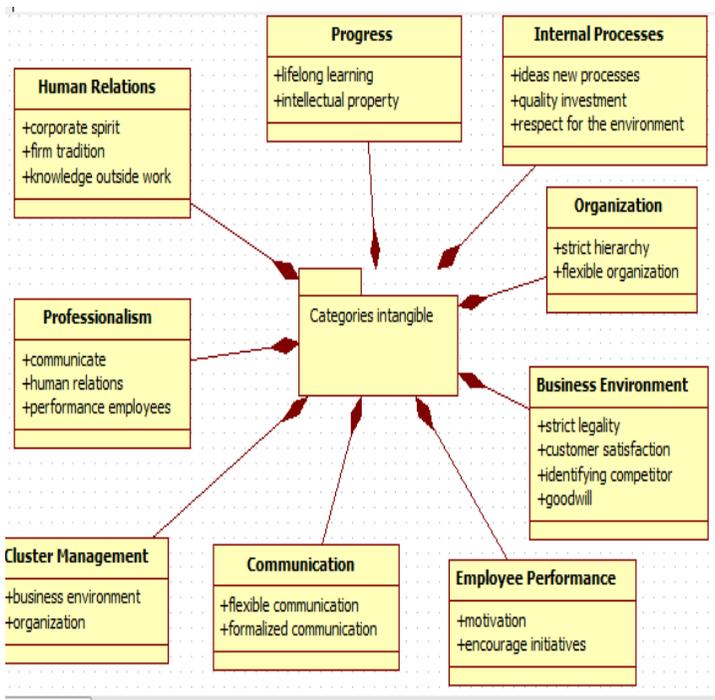
Figure 5: Diagram on categories for intangible managerial aspects

Conclusions

Attributes of corresponding classes of intangible managerial activities can be grouped by categories and quantified with a margin of error depending on external environment. In this case there could be simulated "scenarios" in order to increase the value of the proposed cluster. Currently, it is difficult to make a comprehensive analysis of the quantitative importance of intangible assets in the performance of an organization, as most companies do not publish them even when they calculate intangible costs. In reality, the difference between the book value of a company and its market value is represented primarily by intangible assets (innovation, expertise, adaptability, strong brand, etc.). Such differences begin to be recognized in the current accounting system into the 'Goodwill' account, which allows organizations, for example, at the acquisition of other companies, to pay more than book value, based on the performance of intangible company just

bought. Such procedures should begin to give way also in Romanian culture management so as not to allow large foreign companies to purchase of Romanian companies at book value, which is far from reflecting the real potential of the company subject to the sales process.

Using the concept of trivalent enterprise within a cluster allows restructuring highly specialized companies by creating around them a true family SMEs to undertake part of the products, by-products and residues through further processing to capitalize on avoiding losses, pollution and creating jobs, thus responding to the criteria of efficiency, environmental and social constraints".

Sustainable production and consumption lead to reducing the negative impact on the natural environment, while maintaining or increasing the living standards of human individuals (DEFRA-Department for Environment, Food and Rural Affairs, UK). Basically, this concept requires producing more with fewer resources.

References

[1] Harrison, B., Kelley, M., & Gant, J., (1996*), Innovative firm behavior and local milieu: Exploring the intersection of agglomeration, firm effects, industrial organization, and technological change*, Economic Geography, 72, 233-258

[2] OECD (Organization for Economic Co-operation and Development), (2000), *Local partnership, clusters and SME globalization*, Report, Conference for Ministers responsible for SMEs and Industry Ministers, June 14-15, Bologna

[3] Waits, M. J., (1996), *State of cluster-based economic development in Arizona*. In R. Breault (Ed.), Global networking of regional optics clusters (pp. 1-10). Denver, CO: International Society for Optical Engineering

[4] Ghencea A.,(2012*), Qos and Voice Over IP*, Scientific Papers Journal of Knowledge Management, Economics and Information Technology, vol 4

[5] Albino V., Izzo C., Kühtz S., (2002), *Input-output models for the analysis of a local/global supply chain*, International Journal of Production Economics, Vol.78, pp.119-131

[6] Jacobs, D., & de Man, A. P., (1996), *Clusters, industrial policy, and firm strategy: A menu approach. Technology Analysis and Strategic Management*, 8, 425-437

[7] Isard, W. and Schooler, E. W., (1959), *Industrial Complex Analysis, Agglomeration Economies and Regional Development*, Journal of Regional Science, 1, 19-23

[8] Udrica M., Vatuiu T., (2010), *Information systems - efficiency through analysis, design and implementation*, Ed. Rennaissance, Bucharest

[9] Isard, W., Schooler, F.W. and Vietorisz, T., (1959), *Industrial Complex Analysis and Regional Development*, MIT Press

[10] Loinger G., Peyrache V.,(1988), *Technological Clusters and Regional Restructuring, in Aydalot* [9] P., Keeble D. (eds.), High Technology Industry and Innovative Environments: The European Experience, Routledge, London

[11] http://www.coe.int/t/dg3/socialpolicies/socialcohesiondev/source/Rethinking_en.pdf

[12] http://ec.europa.eu/index_en.htm.