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Constraints to the competitiveness of industrial construction. A case study of Venezuelan oil and petrochemical sector

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1. Introduction

The challenges of today's world require individuals and companies to improve their performance levels as a mechanism to achieve better living conditions and a coherent economic and social development. Therefore, one of the main objectives of the European Union is to become the worlds most competitive and dynamic economy based on knowledge, capable to reach sustainable economic growth with more and better jobs and greater social cohesion. Commission of the European Communities (2003).

However, even with such a global reference and important examples on international markets, not all local scenarios present the conditions needed to achieve the growth, development and proper use of knowledge.

The Venezuelan case, currently widely discussed due to the contradictory currents that analyze national socio-economic performance is one that, on a pattern that seems contrary to global trends, shows signs of weakening of the productive sector. Therefore, in seeking long-term solutions, it is necessary to analyze: What happens with the Venezuelan competitive performance? Why does its industrial sector present a behavior apparently opposed to global trends? What are the limitations that prevent its own players to develop the maximum potential of the country? How can current trends be corrected?.

As for other sectors, competitiveness problems also affect the oil and petrochemical industry in Venezuela, the main source of national income, and are present in their construction and maintenance projects. Through a case study of the construction sector for oil and petrochemical industries, this research aims to identify some factors that limit the competitive performance of Venezuelan industry and the existence of basic elements that can support knowledge management, to propose strategies to help improve their results.

2. Research Objectives:

General: Identify the main elements that affect the competitiveness of industrial construction, through a case study of Venezuelan oil and petrochemical sector, identifying whether the organization present the basic elements that underpin knowledge management.

Specific:

– Identify the main constraints affecting the performance of Venezuelan oil and petrochemical industrial construction.

– Determine the impact that those limitations have on the construction of the Venezuelan oil and petrochemical sector.

– Determine the frequency with which these limitations occur in the construction of the Venezuelan oil and petrochemical sector.

– Identify elements of organizational culture, organizational structure and technology that support knowledge management in the case study.

3. Methodology

This research was conducted through document review and field work in a privately owned industrial construction company in Venezuela (more than 300 workers, levels of sales over US$ 50,000,000 for 2009, more than 40 years of activities).

4. Competitiveness

Creativity, innovation, knowledge management, competitiveness, new markets development, social and ecosystem balance and the development of corporate social responsibility, together are part of the basic elements for companies survival and success in today's world, as they add value to existing processes, develop potential and generate greater prosperity, wealth and employment. Commission of the European Communities (2003).

While academia present different positions in front of competitiveness, as some researchers claim that it study contributes to understanding the key factors that determine economic growth and opportunities to improve the living conditions of populations, but others consider it an unnecessary fixation, it is indisputable that provides references needed to evaluate the factors related to performance indicators, which is particularly valuable for Venezuela. World Economic Forum (2008), Krugman (1996), Lall, (2001).

Competitiveness is associated with the events and policies that determine the ability to build and preserve an environment that facilitates the creation of greater value to organizations and prosperity for citizens. The World Economic Forum (2010) defines it as the group of institutions, policies and factors that determine the level of productivity of a country. The elements described on (Table 1) are used as benchmarks to measure the competitive performance of countries. Garelli (2003).

Table 1. The 12 pillars of competitiveness

Basic Requirements
Institutions
Infrastructure
Macroeconomic stability
Health and Primary education

Efficiency enhancers
Higher education and training
Goods market efficiency
Labor market efficiency
Financial market sophistication
Technological readiness
Market Size

Innovation and sophistication factors
Business sophistication
Innovation

Source: The global competitiveness report 2009-2010

4.1. Competitive policies for developing countries

To achieve competitiveness, some elements are required to support an adequate performance of individuals and organizations, with mechanisms to ensure prompt attention to business, standards, policies, training and general conditions to strengthen small and medium entrepreneurs. Commission of the European Communities, (2003). That is why to overcome poverty in developing countries are required policies reform, strengthening the legal system, the creation of new businesses and improving existing ones. UNDP (2004).

Singh, (2002) retain that due to their internal realities, the policies of developed countries do not allow to face the particular challenges of developing ones, requiring new competitive policies, oriented to offer goods and value added services. Such new policies should be based on a multilateral approach, including issues as corporate governance, corporate management, labor laws, institutional structures, and knowledge. Garelli (2003) considers that their development must come from the social underpinnings, history and national values, in support of achieving its goals of sustainability.

Among conditions that may guide the competitive performance of the nations, we find the proposal of the Golden Rules of competitiveness indicated in (Table 2).

Table 2. The golden rules of competitiveness

What is that countries must do in order to become or remain competitive?
I. Create a stable and predictable legislative environment.
II. Work on a flexible and resilient economic structure.
III. Invest in traditional and technological infrastructure.
IV. Promote private savings and domestic investment.
V. Develop aggressiveness on the international markets as well as the attractiveness for foreign direct investment.
VI. Focus on quality, speed and transparency in government and administration.
VII. Maintain a relationship between wage levels, productivity and taxation.
VIII. Preserve the social fabric, reducing wage disparity and strengthening the middle class.
IX. Invest heavily in education, especially at the secondary level and in the long-life training training of the labor force.
X. Balance the economies of proximity and globality to ensure substantial wealth creation, while preserving the value systems that citizens desire.

Source: Garelli, S. 2003. The Competitiveness of Nations. IMD

With a world economy still suffering the effects of the recession caused by the financial crisis of 2008 and the consequences of worsen natural disasters, it becomes increasingly evident the need to build the foundations of competitiveness as the element on which nations can sustain its recovery orienting towards prosperity, sustainable development and long-term improvement. The Global Competitiveness Report, (2010). Therefore, the golden rules of competitiveness listed above, can serve as reference guides for the creation of valuable competitive policies for developing countries. Pietrosemoli, (2009).

4.2. Knowledge management as an element to support competitive performance of construction companies

Knowledge management is described by Takeuchi and Nonaka (2004) as the continuous process of creation and transmission of new knowledge throughout the organization, allowing the incorporation of new products, services and technologies that facilitate organizational change and to face the new challenges presented by the environment. Thanks to knowledge management, using tools and technologies, individuals and organizations can provide explicit and tacit knowledge that facilitate the growth of the organization and improve decision making in a timely manner. del Moral, et al. (2007).

As the construction is one of the most representative industrial sectors worldwide, by creating jobs and growth, and because of the importance of the services offered to communities, the value of knowledge management transcends all its activities, facilitating innovation, maximizing intellectual capital, providing answers to customer requirements, increasing effectiveness and efficiency, knowledge transfer, allowing to offer products with higher added value and reducing levels of uncertainty. This permit performance improvement processes and supports competitiveness. Kamara, et al. (2002), Egbu, et al. (2004).

To obtain these benefits, Anumba et al. (2005) and Egbu et al. (2004) recommend that construction companies need the production, dissemination and use of these intangible resources, using databases, technologies, tools, strategies, best practices and encouraging research, especially for the sharing of knowledge aimed at achieving sustainable construction. CIB, (2002).

5. Competitiveness in Venezuela

In the developing countries the lack of a level of internal rivalry that encourages innovation, improvement and competition is outstanding, in addition to the existence of high levels of intervention by governments in the economies, which often become a major constraint to economic development. Enright, et al. (1994).

These ideas remain highly relevant in the Venezuela of the twenty-first century, because country shows contradictory messages in its performance levels, with obvious signs of decline in several indicators, contrary to what happens in other nations, even with lower resources. In this research, are identified some of the factors that limit the country competitiveness through what is perceived by part of the productive sector.

5.1. Indicators of competitiveness

The state and changes in Venezuelan competitiveness are presented by the World Economic Forum, highlighting the fall of Venezuela to the position 113, for the period 2009-2010, in a sustained trend in recent years despite high oil revenues, as shown on (Table 3).

Table 3. Venezuelan competitiveness indexes

Venezuelan competitiveness indicators evolution					
Global competitiveness Index. Ranking from 1 to 133	**GCI 2009-10 Rank**	**GCI 2008-09 Rank**	**GCI 2007-08 Rank**	**GCI 2006-07 Rank**	**GCI 2005-06 Rank**
Switzerland (Better position in Europe)	**1**	**2**	**2**	**1**	**4**
Chile (Better position in Latinamerica)	**30**	**28**	**26**	**27**	**27**
Venezuela	**113**	**105**	**98**	**88**	**84**

Source: World Economic Forum. The global Competitiveness Report, 2009-10, 2008-09, 2007-08.

Such behavior is attributed to factors such as the macroeconomic environment, the expansionary fiscal policy, discretionary administrative measures, weak institutional environment, the lack of equity and efficiency in government operations and strategies and high levels of violence and crime. World Economic Forum (2010).

With similar vision, competitiveness indicators presented by the IMD business school in Switzerland, situate Venezuela in the last place of competitiveness of 57 countries evaluated for the year 2009, with deterioration from position N. 55 occupied in 2008. IMD (2010).

5.2. Venezuelan oil sector and basic industries competitiveness:

Añez (2005) and Cámara Petrolera de Venezuela (2006) sustain than although the Venezuelan oil sector has an undeniable growth potential because of the importance of oil as the main source of oil worldwide, Venezuela is a country where despite the resources abundance, the industrial sector supplier of goods and services has not achieved the expected competitive levels.

Following the changes that occurred in recent years, the oil industry faces problems such as loss of expertise due to the qualified personnel have left the industry, the low level of development of oil reserves, the amount of inactive wells, the low levels of research in oil and gas exploration, the policies to sale oil at discount or exchange it for goods and services and resource utilization of the oil revenue to develop political or social policies, which has led to decreased production levels of oil and gas. González (2009).

Other problems of competitiveness of the Venezuelan oil industry, are associated with the "Law which reserves to the state the goods and services related to oil activities", adopted in May 2009. Under such law, once declared as public utility, different private sector assets were expropriated, including drilling holes, water, steam or gas injection equipments, docks, boats, barges, tugs and other goods that provided services to the oil sector. Pietrosemoli (2009).

Due to the combination of above mentioned factors, Venezuela addresses the impact of labor protests that take place more frequently on the oil, iron and aluminum industries, affecting the maintenance activities and oil services, the operation of drilling holes, activities to support oil extraction and production of iron, aluminum and related products. Pietrosemoli (2009).

These protests are associated with requirements for the renewal of collective agreements, payment of labor liabilities associated with the expropriation or compliance with safety requirements and contractual terms. Reuters (2009). Similar problems in other productive sectors have meant that the protests had spread to the automotive, health, education and popular sectors, which protest for insecurity, lack of work, educational problems or lack of

basic services, creating a level of national conflict that affects the quality of life of people and performance levels of small, medium and large enterprises. Pietrosemoli (2009).

Even without precise quantification, the direct consequences of these policies and social conflicts are beginning to manifest in the Venezuelan level of oil production, which went from 3,239,000 barrels per day in 2000 to 2,566,000 barrels per day in 2008 and that early 2010 is estimated by analysts in the order of 2,000,000 barrels per day or less, confirming that country is facing the general weakening of basic industries. BP (2009), González (2010).

5.3. Orientation of national policies of the productive sector

The policy of socialist transformation of the production model, which attempts to centralize production activities in strategic sectors such as production and distribution of food, iron, steel, aluminum and communications, in an effort designed to reach the centralization and nationalization of the economy, looks contrary to venezuelan productivity, competitiveness and entrepreneurship, especially when framed in a whole nationalization effort that in last years has severely affected food industries, telecommunications, electricity, oil, chemical and petrochemical. Tal Cual (2009), Index of Economic Freedom (2009).

5.4. Index of economic freedom and annual index of good governance

According to Index of Economic Freedom (2009), Venezuela occupied position N. 174 out of 179 countries, because of factors that result contrary to economic activity, hindering productivity, competitiveness and entrepreneurship. Among them: conditions of business freedom, trade, monetary, financial, investment, fiscal, size of government, property rights, corruption and labor freedom problems. Governance Index (2009), indicates that Venezuela was ranked at the position 192, of a group of 212 countries due to governance problems, failure of constitutional laws, crime, lack of separation of powers and institutions, violent takeover of private businesses, shortages and inflation. Veneconomía (2009).

5.5. Performance of industrial and commercial sector:

Figure N. 1 Shows the Venezuelan industrial and trade performance in recent years.

Figure 1. Decrease in number of industries in Venezuela 1994-2007. Conindustria (2009)

What explains the deterioration of Venezuelan productive infrastructure, living conditions and governance in a global economic context that in recent years, up to 2008, with the financial

crisis, saw steady growth in many countries? How do you account this in a country with abundance of resources? Figure 2 provides a reference for what Conindustria (Confederación Venezolana de Industriales) details as some of the adverse factors that affect the Venezuelan productive sector.

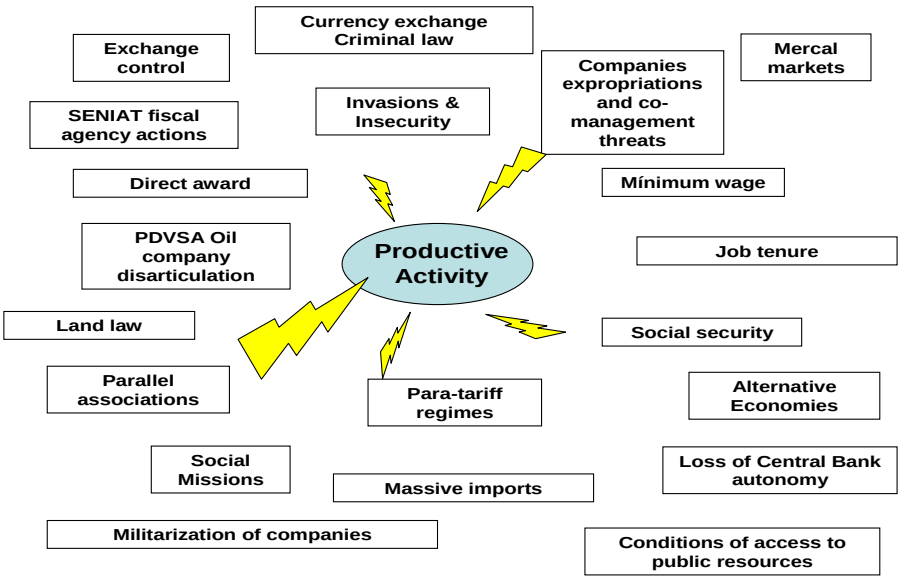

Figure 2. The siege of the Venezuelan productive activity. Conindustria (2005)

5.6. Results of field work

The field work was conducted through a questionnaire applied to 78 company employees working as board of director's members, department's managers, projects managers, resident engineers, project and department supervisors as well as external advisors in the fiscal, accounting and legal areas. The questionnaires were processed through SPSS version 10.0 and Excel. From 90 questionnaires sent were obtained 56 responses, corresponding to 62,22%. For the research objectives the following results were found:

– Identify the main constraints affecting the performance of Venezuelan oil and petrochemical industrial construction and the impact that those limitations have on the construction of the Venezuelan oil and petrochemical sector.

Main constraints	Cases Impact N. 1	%
Technical-Constructive	4	7,14%
Contractuals/Relation with clients	11	19,64%
Resources availability	12	21,43%
Labor	7	12,50%
Financial	20	35,71%
Social	0	0,00%
Safety and public order	2	3,57%
Total responses	56	100,00%

– Determine the frequency with which these limitations occur in the construction of the Venezuelan oil and petrochemical sector.

Main constraints	Very Frequent & Frequent Cases N.	%
Technical-Constructive	19	14,96%
Contractuals/Relation with clients	20	15,75%
Resources availability	28	22,05%
Labor	22	17,32%
Financial	25	19,69%
Social	5	3,94%
Safety and public order	8	6,30%
Total responses	127	100,00%

– How can be seen actual working conditions on oil and petrochemical sector compared with precedent years.

Main constraints	How are perceived actual working conditions Cases N.	%
Better	3	5,56%
A little better	7	12,96%
Same	9	16,67%
Worse	30	55,56%
Much worse	5	9,26%
Totales	54	100,00%

– Identify elements of organizational culture, organizational structure and technology that support knowledge management in the case study.

Cultural aspects	% Very frequently	% Frequently	Total
a. Knowledge is formally recognized as company asset	29,1%	25,5%	54,6%
b. There are formal guidelines to support knowledge generation, diffusion, reuse and transfer	9,1%	27,3%	36,4%
c. New knowledge contributions are recognized and rewarded	12,7%	20,0%	32,7%
Organizational aspects	**% Very frequently**	**% Frequently**	**Total**
a. There is a specific structure to manage knowledge	10,9%	16,4%	27,3%
b. There are specific processes to identify, transfer, structure, store and distribute knowledge	12,7%	32,7%	45,4%
c. Organizational learning and research withing the organization are emphasized	8,9%	26,8%	35,7%
d. Project hits and misses are revised at project ending	18,5%	7,4%	25,9%
e. Hits, misses, and decisions are documented and made available to be reused on following projects	11,10%	9,30%	20,4%
Technological aspects	**% Very frequently**	**% Frequently**	**Total**
a. There are programs or technological tools to manage knowledge.	21,8%	18,2%	40,0%
c. There are mechanisms of information preservation and protection	41,1%	37,5%	78,6%
d. Audits are conducted to validate the compliance and security controls to prevent loss of information and knowledge	26,8%	37,5%	64,3%
e. Specific trainings are provided to staff to make better use of technological resources	10,9%	18,2%	29,1%
f. There have been events of loss of intangible assets of organization in electronic or physical form	0,0%	12,7%	12,7%

6. Conclusions.

As this is a preliminary research, with field work limited to the vision of one Venezuelan oil and petrochemical construction company and its external advisors, conclusions are not intended to pretend present a total view of competitiveness constraints affecting country performance, but to highlight the existence of some conditions that limit the performance of industrial constructions. Keeping in mind those limitations, based on the documental and field research findings, is palpable that:

– Despite the abundance of mineral and agricultural resources, Venezuelan productive sector in general, lives an environment characterized by physical and legal insecurity, financial, social, contractual, inflation and labor problems, public policy discretionary, loss of knowledge and high levels of conflicts, which are perceived by many of the actors of the production processes as obstacles that weaken national competitiveness and affect quality of life of the population.

– Those problems are not limited to Venezuela but may affect many other, especially developing countries, so it is important to realize that globalization can offer important knowledge's that should be followed as guidelines in order to improve local performance.

– To reverse the negative trends affecting countries in terms of competitiveness, its required to initiate a cultural change that recognizes that sustainable development must be based on ethical foundations, principles and values, investments, employment, and improvement performance levels for small, medium and large enterprises and that this requires developing competitive policies with long-term view, learn from past mistakes and make joint efforts between governments, academic sector, companies and citizens.

– To reach this goal, knowledge management plays a very important role, since make available resources that can help to solve the problems of national competitiveness.

– As one of the major competitive policies necessary for developing countries and for construction companies for oil and petrochemical sector, it is suggested to initiate actions by governments and organizations to provide appropriate knowledge management as a strategy that may lead to deep changes in management in order to achieve sustainable development with social content.

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