

**COMPETITIVE STRATEGIES FOR INTERNATIONALIZATION OF COMPANIES.  
CASE STUDY: COMPANY LEADER IN RESEARCH, DEVELOPMENT AND  
INNOVATION**

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**Abstract:**

In a global economy, where technology and human resources define the levels of economic development, knowledge has turned into the most important resource for competitiveness. Highly competitive environments demand more intelligent, integrated and flexible companies in order to face the continuous changes in the world. The reaction of Latin American firms to this challenge should be based on the design of internationalization strategies that emphasize an organizational structure built on knowledge and innovation.

The main objective of this paper is to investigate how Odebrecht, a Latin-American company, leader in research, development, and innovation (R&D&I), implements a successful internationalization strategy based on knowledge management.

Competitive strategies for internationalization of companies. Case study: company leader in research, development and innovation

This paper has been developed using the Case Study methodology (YIN, 2001). The analysis of the strategy has been conducted with the Delta Model (HAX & WILDE 2001). The results show that Odebrecht builds its strategy, termed system lock-in focusing on an organizational structure for innovation.

**Keywords:** knowledge management, competitive strategy, organizational structure, innovation, internationalization

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**1. Introduction**

The strategy used in the internationalization of a company is seen from different perspectives as a very complex phenomenon. The complexity of this phenomenon has motivated the interest of a large number of researchers. They have developed a variety of different theories in order to explain this phenomenon. Although the multiple interrelationships between country headquarters and international markets are given, it has been impossible to create a unique model, but it has been possible to give concrete answers to particular questions (BARBER & SUÁREZ, 2001). Nowadays, this phase of globalization affects the economic organization and macroeconomic policies of countries, as well as the production organization, and other functions inside companies. The ways companies adapt and get inserted into a global economy are related to historical processes and its main characteristics, such as size, area, technology, etc. (KOSACOFF, 2003).

The strategy of the internationalization of Latin-American companies is a topic poorly explored in the academic community. Several explanations have tried to describe the international trade of South America, which amounts to less than 4 % of the global total (OMC, 2002). There is a new world economy, where technology and human resources define levels of economic prosperity in a world increasingly integrated using commercial flows and investments. Also in Latin America there exists a new national economy that is more open and deregulated. In order to explain the new economic environment, KOSACOFF (2003) analyzes that at the beginning of the new millennium there is a word that defines perfectly the perception of the Latin-American managers: challenge. This word and what it represents explain managers' attitudes and the different answers from each company to this new scenario.

Companies' economies are more integrated and flexible to the relentless changes of the world environment (HAX & WILDE, 2001). Their reactions are strong mutations and adjustments to the new game rules. Finally, the type of response of the Latin-American companies to this challenge separates them in two main groups.

In the first group there are those companies that take a proactive attitude and face the process with a clear strategy, and in the second group there are those companies that try to survive and give defensive answers to an aggressive environment. The *Odebrecht Engineering & Construction - OE&C*, company leader in research, development and innovation (R&D&I) and the major services exporter in Latin America, presents a proactive and challenging response to globalization.

The structure of this article has been divided in two parts. In the first part, there is a review of the literature in which the most relevant contributions are outlined. We begin this review giving details of the Delta Model, the methodological tool used in this study. This model developed by HAX & WILDE (2001) was constructed by a research initiative directed by their authors in Sloan business school with the participation of 30 CEO's of global corporations in several workshops and data provided by more than 100 internationalized companies.

The methodological framework that Delta developed does the following: 1. Defines strategic positions that reflect the new sources of benefits in the international environment. 2. Aligns the strategic options within the company activities and gives congruence between the strategy management and implementation. 3. Determines processes able to respond to unknown situations.

Later a review of the main organizational structures designed for innovation will be presented, because the results of the study target direct relationships between the international strategic situations. In the second part of the article and as a result of the conclusions derived from a review of the literature the methodology of the case study will be applied (YIN 2001). Thirteen interviews were held with important executives and a survey was made of 120 employees in 5 different countries. A statistical technique called multi-variant analysis was used to process the data and an interpretative analysis of the results was made using the method called Pattern Adaptation (YIN 2001) with the Delta model as the pattern. While analyzing the strategy of OE&C through the Delta model framework it was perceived that they manage to develop the system lock-in strategy in their business cycle. In order to realize this strategy OE&C applies the process of strategic setup of a organizational structure designed for innovation. This type of structure allows the development of a strategy that increases the integration and adaptability to the new competitive international environment that is in continuous and inevitable change.

## 2. Review Of The Literature

### ***2.1. Evolution of the implementation of the strategy concept***

ANSOFF (1977) defines the term "strategy" as everything associated to the different relationships between companies and their "environment". In terms of products and markets, the trajectory of the company in its external environment is defined by the following elements: set of markets-products, growth vector and competitive advantage. Thus, the global strategy is composed of several components, such as: objectives (economical, non-economical and financial) and by the strategy (product-market, growth vector, competitive advantage, synergy).

PORTER (1986) made a conceptual contribution by spreading the competitive advantage as a characteristic that must work strategically for the company to create value for their clients and that must surpass the cost of production. The strategy definition approached by MINTZBERG & QUINN (1998) adopts 5 dimensions, well-known as 5Ps, which are considered in the Delta model: 1- A strategy as a plan, 2- A strategy as an excuse, 3- A strategy as a pattern, 4- A strategy as a position, 5- A strategy as a perspective.

OLIVEIRA (1992) conceptualizes strategy as a set of forecasts to be adopted as the center of decision supposing an environmental situation in which the future tends to be different from the past. The company must find conditions and ways of acting on the variables that intervene, so it could exercise some influence on these. This presupposes the need of a constant decision process inside an environmental interdependent and mutable context.

PORTER (1992) understands strategy in the context of competitiveness. The author defines a competitive strategy with a basic objective that enables the enterprise to develop a vision of how it should be structured to survive and grow in a competitive environment. For Porter, a competitive strategy is a result of the understanding of the rules of the competition that determines the attractiveness of a sector. The rules could be enclosed in the well known Five Competitive Forces; with its knowledge it is possible to decide the strategic course with the objective of having a better performance than the competitors. The identification and analysis of the competitive pressure strength allows establishing the strong and weak points of the company, directing its position and showing the areas where the strategic changes could produce the highest return. Additionally it highlights the areas where the impact of the external forces is more intense, showing opportunities and threats.

PRAHALAD (1997) challenges the concepts that lay in Porter's model, because it tries to understand the structure of a sector having as its framework the Eighties, when the dominant

question was “How can I position the company in the structure of the sector that it acts?”. For Prahalad, Porter’s proposal refers to a time when the environmental variables did not change radically. Nowadays we live in a context of important changes, discontinuities and a global environment. Thus, the question that should be answered in the late Nineties, for Prahalad, is different, “How could strategies be formulated to enable the company to model the future so that it does not represent merely a positioning exercise?” Starting with this perspective a strategy does not conform with an exercise of ex post facto analysis, but as a discovery and creation process. Therefore, a strategy is revealed as being innovative and creative and is interpreted as the search of new business opportunities and interactions with clients, companies, technologies and markets.

PORTER (1998) reconsiders the concept of strategy in light of the changes in the current phase of globalization, therefore suggesting the following guidelines:

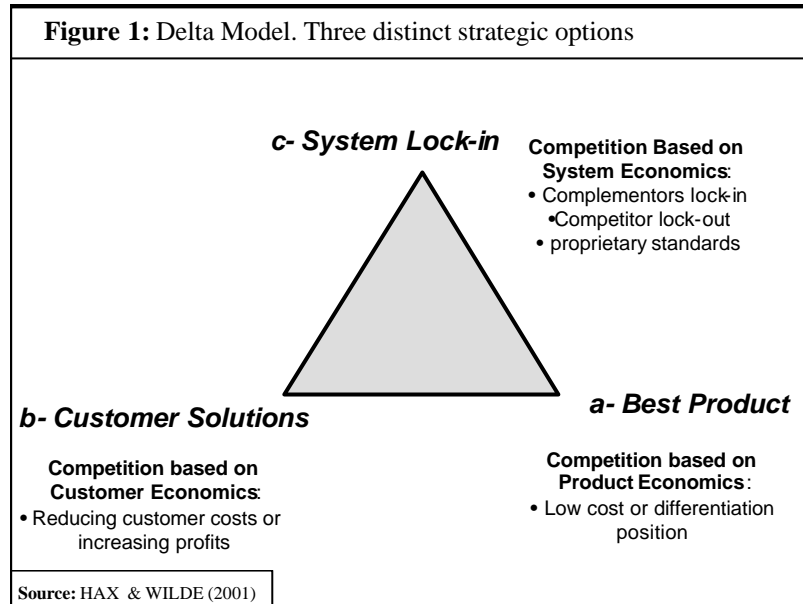
- A strategy is not an intellectual exercise, but rather a way of corporate life. The author considers strategy in a global context as a process to differentiate from competitors in order to obtain a competitive advantage.
- Business-wise two different dimensions should be considered: The attractiveness of the business itself and the situation/positioning of the company itself.
- A strategy implies different ways to compete that are not equally applicable to all the companies of the same sector. In other words, from a specific company’s point of view, the strategy selected is unique considering a specific market and a specific group of clients that the company wants to target.
- The essence of the strategic thought is based on seeing yourself as the owner of a system to compete in a particular way to offer a defined product or service and not to see yourself as the owner of one or more of the skills.
- The strategy is shown in specific activities in all the areas of the business.
- The most characteristic product of globalization could be the clusters strategy, where a group of companies develops a common strategy to add differential value to the final product that the market offers.

## ***2.2. New millennium strategy: model Delta***

This model originates from the analysis of internationalized companies in the context of the new millennium. The Delta model was developed by HAX & WILDE (2001) specifically for strategic analysis of global corporations in the second half of the 1990s. It shortened its functionality in response to market challenges and extended the spectrum of available strategic positions that are in practice. According to HAX & WILDE (2001), conventional strategic theories and business practices are not commensurate with the required direction of executives and essentially do not support decision-making in the new millennium. Strategic concepts have changed in response to the business environment. Accordingly, HAX & WILDE have made revisions to the strategic practices used in order to be considered or refuted by the model. According to them, the only common denominator in the global business performance is continuous and inevitable change.

When HAX & WILDE (2001) analyzed the most influential strategic contemporary standards explained by PORTER (1990), they noted that they are based exclusively on two methods of competition: low cost or differentiation. A company can achieve low cost by reducing costs aggressively or otherwise prevail by creating a unique perceived value. They argue that even though low cost and differentiation may use different strategies, they are both centered on cost savings or on delivering a better product. Customers are attracted mainly by price or value. Although the best product strategy is relevant, their research into global organizations showed that this does not describe all the methods that companies employ in the actual business world. Microsoft and Worldcom are two good examples that illustrate this. Neither Microsoft nor Worldcom is the least expensive or the most differentiated in its sector; however, they are both market leaders.

The research was done with the CEOs and information taken out of more than 100 companies. Their strategy and implementation process led to the development of this model. The model has three strategic options that better reflect many ways companies actually compete (see figure 1). It fills a significant gap in strategic thought development, offering three potential options:



**a- Best Product.** Classic competitive methods with low cost and differentiation grouped together. The best product option allows companies to group and maintain clients with intrinsically superior products. In order to obtain this proposition they are rapidly introducing products and attempting to be the first in the market to establish design dominance.

**b- Customer Solutions.** It is based on offering a large portfolio of products and services to satisfy the majority or all the customers' needs. The focus is more customers' cost-savings than product savings. The proximity to the customers allows a company to anticipate their needs and to work together with customers in the development of new products. The intense knowledge of customers' requirements and the adaptation of products to these needs have a dual effect: the investment the customer has to make to learn how to use a new product or service can establish a significant barrier to change. This learning process shows customers' requirements increasing the company's ability to satisfy such needs. Both cases have a positive impact on the relationship between the company and the customer.

**c- System Lock-in.** This strategic option is developed in an expanded environment, sometimes focused on the clients, and other times on the product. The company considers all the elements of the system that contribute significantly to the creation of economic value. In this option, the relationship plays a fundamental role. The company's interest should reside in feeding, attracting and retaining the "complementers", and other smaller industry participants. The complementers are not the competitors, but the suppliers of products or services that complement the company's offerings. HAX & WILDE (2001) refer to Microsoft and Intel, because neither company has won based on



product costs, differentiation, or client focus. These companies have a system lock-in. According to the authors, these strategic options are not mutually exclusive. A business can decide on a mixed strategy that jointly utilizes some activities within the three options, but there is always one dominant strategic orientation for critical activities and processes adopted by the business.

### **2.3. Strategic analysis using DELTA model**

For the methodological analysis, HAX & WILDE (2001) advise the use of the structure and functionality of the Delta model jointly with three fundamental processes that are always present in the strategically dominant tasks:

**a- Operational effectiveness.** Consist on delivering products and services to the customer. In its broadest sense this process includes all the supply chain elements. Its main focus is to create the most cost- and asset-effective infrastructure to support the desired strategic position of the business. It is the core of the productive engine and the source of capacity and efficiency. Although it is relevant for all businesses, it becomes most important when a company chooses a strategic position of the best product.

**b- Customer targeting.** Refers to the activities that attract, satisfy, and retain the customer. This process ensures that the customer relationships are managed in the best way. It identifies and selects attractive customers and enhances customer performance, either by reducing the customer's cost base or by increasing its revenue stream. At its heart, this process establishes the best revenue infrastructure for the business. While customer targeting is critical to all businesses, it is most important when the strategic position is that of total customer solutions.

**c-Innovation.** Conformed by a continuous stream of new products and services to maintain the business's future viability, this process moves all the firm's creative resources (including technical, production, and marketing) to develop an innovative infrastructure. The center of this process is the renewal of the business in order to sustain its competitive advantage and its superior financial performance. The preservation of innovative capabilities is critical to all businesses, and it becomes central when system lock-in is its strategic positioning.

In order to visualize this, the company's strategic activities should be placed on the option that best represents the majority of its activities, as shown in Chart 1.

**Chart 1:** Characteristics of Three Options for the Strategic Positioning Delta Model

	<b>Best Product</b>	<b>Customer Solutions</b>	<b>System Lock-in</b>
<b>Scope</b>	Disfeatured Fully featured <ul style="list-style-type: none"> <li>• Low cost</li> <li>• Differentiated</li> </ul>	<b>Broad Product Range:</b> <ul style="list-style-type: none"> <li>• <i>Bundling</i></li> <li>• Joint development</li> <li>• <i>Outsourcing</i></li> </ul>	<b>Nurturing complementors:</b> <ul style="list-style-type: none"> <li>• Variety and number</li> <li>• Open architecture</li> </ul>
<b>Scale</b>	<b>Product:</b> <ul style="list-style-type: none"> <li>• Market share</li> </ul>	<b>Customer:</b> <ul style="list-style-type: none"> <li>• Customer share</li> </ul>	<b>System:</b> <ul style="list-style-type: none"> <li>• Complementor share</li> </ul>
<b>Bonding</b>	<b>Link to Product:</b> <ul style="list-style-type: none"> <li>• First to market</li> <li>• Dominant design</li> </ul>	<b>Link to customer :</b> <ul style="list-style-type: none"> <li>• <i>Customer lock-in</i></li> <li>• Learning</li> <li>• Customization</li> </ul>	<b>Link to System:</b> <ul style="list-style-type: none"> <li>• Competitor lock-out</li> <li>• Proprietary standards</li> </ul>

**Source:** HAX & WILDE (2001)

#### 2.4. Organizational Structures for Innovation

The high dynamic and turbulence of the environment forces the organizations to incorporate new durable and own advantages. The way a company incorporates a competitive advantage will depend on its structure, functionality and environment. Organizational theorists such as HANDY (2001), MINTZBERG (2003) and NONAKA & TAKEUCHI (2003) indicate that at the present time the organizations orientated to innovation are those that obtain more lasting advantages. Thus, the innovation strategy has to find a fertile field inside the company itself, and the company should also be setup (organized) in such a way that it is proactive to the creation of these competitive advantages.

Nowadays, is essential that a company develops an organizational structure that supports, provides and simultaneously promotes the election, formulation and introduction of innovation among its strategies. The most recent theories of the new organizational approaches appear as a result of the needs that companies have to improve their flexibility and efficiency, and to win dynamism and capacity of adaptation to the requirements of the increasingly changeable current environment. For this reason the design of the organizations has evolved in the last few years toward more flexible positions, with a clear trend toward decentralization. According to MORCILLO (2003), in the current context, companies should demand certain capabilities to their organizational structure; these demands can be summarized in 4 points.

- a- **Flexibility.** ITTNER and KOGUT (1995) define the flexibility of an organization as the ability to respond to changes and uncertainties of the environment. A flexible structure takes in consideration the nature and effects of both internal and external factors (MORCILLO, 2003).

- b- **Simplicity.** With this term MORCILLO (2003) wants to refer to the strategic tendency to unload the organizational structure.
- c- **Integration.** The creation and use of own branches abroad are a risky and complex option that exposes to danger a large volume of resources and organizational capacity that have to be integrated under the same values and corporate philosophy (WILSKA, 2002).
- d- **Knowledge.** Searching for sustainable competitive advantages in the long term, and immersed in the theory of resources and capacities, knowledge management has been, undoubtedly, the most aggressive trend to enter as an the strategic thought (DRUCKER, 2001).

On the other hand, these new ways of organization involve a cultural revolution, because people should learn to live in an environment of change and to lose their aversion to risks. The flexibility of a structure will be reflected in its capacity of adaptation to the changes in a permanent way. Most of the new organizational models that we can find in books concur that the "flexible company" is divided in two clear differentiated parts: the nucleus that contains the activities and processes that create value and the periphery that assembles the activities commercially related to contracts of given services. Next, the models of flexible companies proposed by HANDY, MINZTBERG and NONAKA & TAKEUCHI will be presented shortly. These models integrate more directly the technological change and will help us to identify the organization type in OE&C.

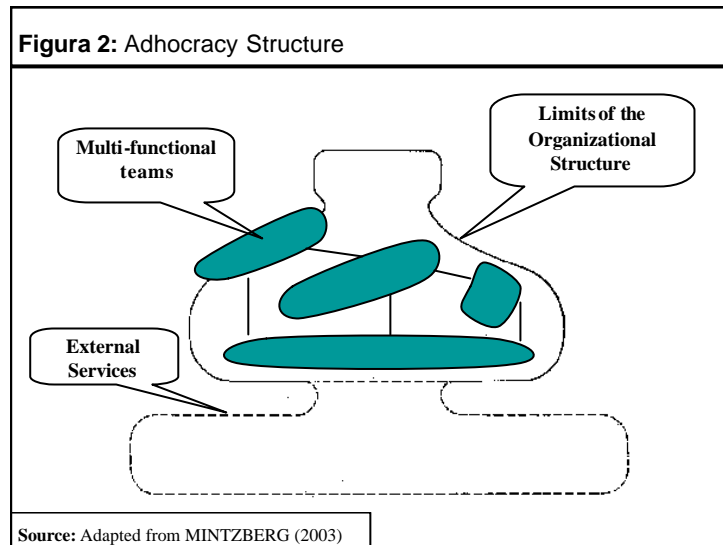
**2.4.1. The Clover Organization.** In situations where dynamism, complexity and uncertainty are present, the Clover organization of HANDY tries to reconcile flexibility with integration. Beginning with the rupture of their value chain, the company looks for the maximum concentration of activities, efficiency and flexibility through established relationships and autonomy in the development of its basic activities. The clover organization is composed by 3 big areas, or leaves, (HANDY, 2001): In the first leaf, the professional nucleus can be found, it is where all the company's core activities are; The second leaf is the subcontracting area, due to the fact that the non essential work for the organization will be outsourced with a smaller cost; the third leaf corresponds to the flexible work force composed of part-time workers and / or temporary workers, who will be included in the organization as a production need. There would also be a fourth area that corresponds to the work passed over to the clients (such as the self-service at a gas station). The work in the Clover organization is difficult to order, since every area of the clover could present a

certain structure with different design parameters and different management needs. The critical area of the clover is the nucleus of permanent workers. The essence of the model is the existence of linkage mechanisms and coordination systems that facilitate the constant adjustment towards changes.

**2.4.2. *The Intelligent Organization.*** The Intelligent Organization or Triple I organization (Intelligence + Information + Ideas = Value Added), outlined by HANDY (2001), emphasizes the technical and human part. Organizations must put its efficiency-based, intelligent Human Resources in charge of getting information and generating ideas. The new company will reinforce its technical part by using both staff and intelligent machines. The human part will consolidate actions while looking for agreement, because organizations will stop being control organizations and change into consensus organizations. The Triple I Organization is, in fact, the basis for any of the new organizational models for innovation. This type of organization shows the importance of developing the organizational together with the individual learning, resulting in an organization where people constantly expand their ability to get the expected results. Where new thought patterns are cultivated, the collective aspiration is freed and people continuously learn to learn (SENIGE et al., 2003).

**2.4.3. *The Federal Organization.*** BUENO (1996) defines the Federal organization as an evolved variant of a divisional company, since it is based on the coalition of sub companies. At the same time each of the decentralized units could be structured as a clover. The model developed by HANDY (2001) is appropriate for big diversified business groups with a multinational environment. The diversified and internationalized divisions or companies follow the instructions of the central unit, which is responsible for the strategic plan. Federalism supposes a variety of groups that work together under a common objective with some shared identity, which means that the integrative principles of this organization will be their objectives, mission and culture.

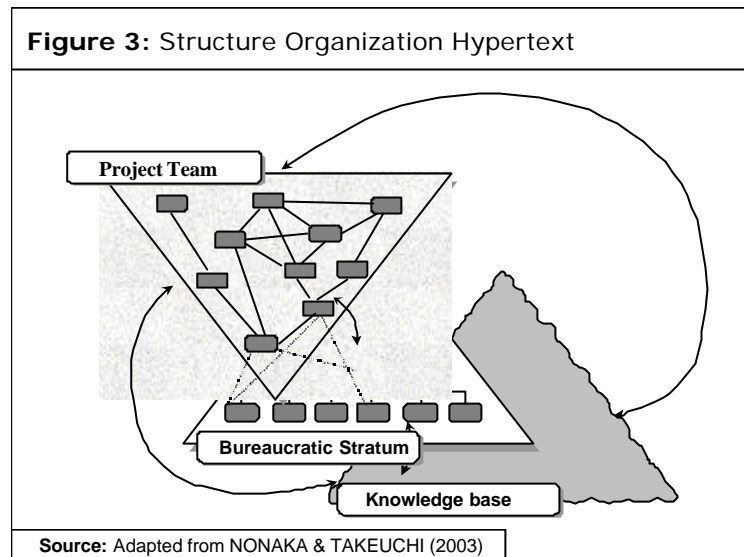
**2.4.4. *The Adhocracy.*** MINTZBERG (2003) pose that the adhocracy is the most suitable mode of organization to adapt rapidly to complex and dynamic environments. The author integrates the five parts that compose an organization: the “strategic apex” or high management; the “intermediate line” or intermediate level; the “nucleus of operations” or basic work realized by the workforce; the "tech-structures" or analysts that participates in the planning and control; the support staff, which provides indirect services to the rest of the organization.



The shaded areas that appear in figure 2 are the ad-hoc group, multifunctional teams in charge of the development of concrete projects. As it can be seen some of these groups are in the boundaries of the organizational structure and indicate that sometimes the company requires external experts. The continuous line of the figure represents the limits of the organizational structure and the discontinuous line shows the external resources hired by the company. The adhocracy is a simple organizational model with some fluid communication systems and where teams of experts are formed to develop innovation projects (MORCILLO, 2003). These teams have great autonomy and constitute real power centers. The adaptation among the different experts who work together is achieved through connection mechanisms (information systems, quality circles, creativity, etc.). According to MINTZBERG (2003) the adhocracy is an incredibly flexible structure that demands of its members a complete adjustment to the conditions of the environment where they act. They will have to adjust to the necessities of their clients (“operative adhocracy”), or to their own (“administrative adhocracy”), without allowing the minimum room for rigidity.

**2.4.5 The Organization Hypertext.** The approach of NONAKA & TAKEUCHI (2003) is based on a model of creation of knowledge that is spread in the organization by means of the dynamical interaction among the individuals, which allows the transformation of tacit knowledge into explicit knowledge and vice versa, so that there emerges from this constant cycle a spiral of knowledge. The authors outline four possible types of conversion of the knowledge: the socialization (of tacit knowledge to tacit knowledge); the externalization (when tacit knowledge becomes explicit knowledge); the combination (from explicit to explicit) and the internalization (when explicit knowledge is transformed into tacit knowledge). Thus, a company needs a suitable structure that facilitates the generation of knowledge inside the organization. The authors present an organizational

design that provides a structural base for the creation of organizational knowledge. The main requirement for this design is that it provides to the knowledge creator company the ability to create, to exploit and to accumulate new knowledge continuously and repeatedly in a spiral and dynamic process. The structural way creator of knowledge consists of organizational environments (see figure 3):



**a- Bureaucratic:** the organization manages their market operative and economic commitments in the short and medium term.

**b- Work teams or task forces:** it establishes the priorities in the medium and long term, especially when they deal with projects of innovation in processes or products.

**c- The reception, storage and transformation of knowledge.** "Bureaucracy is effective when generating combination and internalization, while the temporary work teams are desirable for the socialization and the externalization" (NONAKA & TAKEUCHI, 2003). A new organizational form, which includes the other two, will appear as an auto-organized, non-hierarchical complementary structure in comparison to the formal structure. The most appropriate metaphor comes from the hypertext initially appeared in computer science. As the hypertext document, the hypertext organization is formed by several levels or interconnected contexts. Generally, three layers are established: the system company or bureaucratic layer; the project teams; the knowledge base.

### 3. Methodology

The adopted methodology was the case study, which, according to YIN (2001), makes it possible to realize an empirical research that analyzes a contemporary phenomenon in real life, and is especially useful in a company where the boundaries between the phenomenon and the context are not clearly defined. To look at the objective of the study, the Protocol of the case study was elaborated (YIN, 2001). It contains procedures, tactics and general reservations that are used as a guide to contemplate the general vision of the project (objectives, questions, bibliography, etc.), field procedures, schedules (questionnaires, points to extend, specificities) and a methodological guide of the study.

Initially, the processing of secondary sources was used as a technique of gathering data such as bibliographic references, documentary and academic research. Later on, primary sources were used to process information. The semi-structured individual interview was used as a boarding technique, through a questionnaire with direct questions using a list of pre-established topics. The semi-structured character implies the combination of certain standardized open questions with enough freedom, in order that the interviewer exploits specific aspects in a deep way and asks appropriate questions along the interview. Thus, a questionnaire was used to design the objective of identifying the process of strategic positioning of OE&C. Other questions not directly related to the topic were asked too, with the purpose of getting a characterization of the company. Thirteen interviews were held with top executive and 120 questionnaires were applied to employees in 5 different countries. The information was processed using multi-variant statistical techniques and the interpretive analysis was carried out following the limits of the Delta model pattern.

In order to fulfill the methodological requirements of YIN (2001) the following items were demanded:

- Using multiple sources of evidences
- Logical linkage of evidences and information
- Analyzing temporary series and theoretical explanation
- Using a case study protocol
- Developing a database for the case study

This made it possible to determine the most important strategic activities of OE&C's to collaborate with the object study and generalize analytically a particular set of results inside a more

Competitive strategies for internationalization of companies. Case study: company leader in research, development and innovation

general theory developed in the bibliographic review. This review articulates a well formulated theory starting from the objectives of the study to find a logical foundation for the unique case of OE&C.

**Application in 5 different countries.** The questionnaires and interviews semi-structured applied in the several teams of projects executed by OE&C in different countries, such as Brazil, Argentina, Uruguay, Peru and USA, followed the outlines mentioned before. The functionality and structure of these work teams were measured separately in each organizational layer (Big Company, Small Company and Center of Communications). The Lickert Scale (from 1 to 7) was used, and the questions were developed and analyzed according to the bibliographical revision and Delta model presented in the study. The strategic categories of analysis to identify in the company are: operational effectiveness, client orientation and Innovation. They were detailed in the following methodological guidelines through all the projects of OE&C analyzed in the 5 countries:

- a- Main mechanism of adjustment / coordination,
- b- Structures,
- c- Essential part of the Organization,
- d- Context,
- e- Features,
- f- Disadvantages.

Once the information was collected, the process of analysis and interpretation of the information began following the theoretical framework developed and looking for corporate convergence of information expressed in the questionnaires and interviews using the Delta Model methodology. The analysis of the data considered different scales of the strategy adopted, according to picture 1: Scope, Scale and Limit. It also included the following variable categories:

- a. Flexibility (power, decisions making, reaction speed, etc.),
- b. Simplicity (hierarchy, decentralization, etc.),
- c. Integration (managerial philosophy, set of values, cooperative strategy, etc.),
- d. Knowledge (knowledge management, innovation)

#### **4. Case Study**

The subject of this work is the successful strategies in internationalization. The objective is to analyze the strategy used during the last 20 years of internationalization in a Latin



American company of Brazilian capital and to determine the structure that allows a sustained success.

#### **4.1. The Odebrecht Engineering & Construction-OE&C**

Founded in 1944, the Odebrecht Organization is active in Engineering & Construction. With its headquarters in Brazil, it has over 28,000 employees working in South America, North America, Africa and Europe.

Odebrecht's founder, Norberto Odebrecht, revolutionized construction methods, shortening the production time for nine-apartment buildings from three years to nine months. Combining Lutheran strictness with Brazilian flexibility, the company fostered great transformations in traditional planning and building methods. Along this line, Delegated Planning was created, a key concept in *Odebrecht Entrepreneurial Technology* (TEO). TEO consists of combined principles and practices in which each employee is like a partner, sharing responsibilities for the project success. In 2002, Odebrecht Holding ranked 25th among the largest exporters in Latin America, and first among exporters of services. It was the largest private investor in Latin American technology. That same year, OE&C had 29 thousand employees worldwide. The Odebrecht Group's Vision for 2010 is "To be one of the top five private-sector corporations in the Southern Hemisphere, with commanding market share in the segments where we compete, and a significant international presence". In the next table the economic description of OE&C is presented:

**Table 1:** Exportation Percentage of gross earnings for OE&C by geographic region (in millions of US\$)

Country /Region	1998	1999	2000	2001	2002
Brazil	1,330	550	587	484	337
A. Latina	514	421	418	375	397
Africa	223	143	222	279	302
USA	209	180	124	74	80
Europe	343	353	176	115	108
Other countries	1,289	1,097	940	843	887
<b>TOTAL</b>	<b>2,619</b>	<b>1,647</b>	<b>1,527</b>	<b>1,327</b>	<b>1,224</b>

**Source:** Financial report (Odebrecht; 2003)

#### **4.2. Analysis of the Delta model in OE&C**

The first technical methodological analysis done from the logical sequence of the Delta model is detailed in Chart 2.

**Chart 2:** Historical characteristics of OE&C strategies

	<b>1- Best Product (1940 - 1970)</b>	<b>2- Client Oriented Solution (1980 - 1990)</b>	<b>3- (System Lock-in) (trend begun at the end of the 1990)</b>
<b>Scope</b>	Cost (bidding) Differentiated (closed contract according to client specifications)	Executed jointly with other firms on multidisciplinary projects. Various contributors designated by client (OE&C is not leader or coordinator). Outsourcing	Proactive search and promotion of the business and all the interested. ( <i>Construction Management</i> , new contracts type, EPC, BOT). Coordinate contributors, interfaces and relationships among all those involved. Joint-venture, alliances. System Integration of international security rules, sales, and business management
<b>Focus</b>	<b>Product:</b> Public Bidding. (Domestic)	<b>Client:</b> requirements for E&C projects execution (South Hemisphere)	<b>Clients:</b> all the integrants of the business (North & South Hemisphere)
<b>Boundaries</b>	Got responsible. Product Cycle (domestic market leader). Endorsements from public, banks, and multi-laterals.	Transition from public to private. Private client lays out requirements and OE&C didn't have to assume responsibility. Client adoption by project and loyalty. Sectors with new technology.	Created negotiation power with clients by: 1- addressing requirements, 2-providing financing and insurance. 3- legal platform, technology and patents, 4- ability to influence project outcome, 5- assumption of risk and assurance of business. Investment in innovation and patents

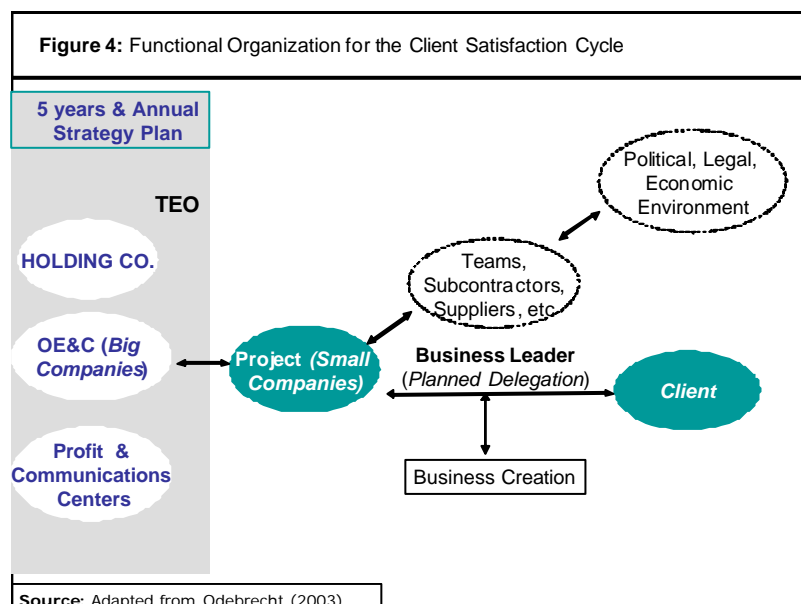
**Source:** Adapted from HAX & WILDE, 2001

The results of the interviews with the top executives and the analysis of their historical process of performance in internationalization showed that the success of internationalization is mainly the result of the *Odebrecht Entrepreneurial Technology* - TEO. The TEO is the common business culture that guides the performance of all elements in the Odebrecht Group. It is composed of a combined system of Principles, Concepts, and Standards (See book: ODEBRECHT, N.(2003). *Survive, Grow & Perpetuate. TEO*. Salvador Odebrecht Foundation) that have originated from business practices cultivated over many years and have been perfected in the daily relationship with clients. OE&C is a flexible, simple structure and is integrated by TEO. The system is centered on the development by the Business Leader of the Business Creation activity, which is based on the Annual & 5-Year strategy plans determined by the Holding Company and the **Big Companies**. The leader then develops **Small Companies** (projects) in order to assure the clients' satisfaction. The Business Leader is not only an expert within that specialty, but should coordinate the political, legal, and

economic landscape based on the project players. In order to accomplish this, TEO has three concepts that guide its performance:

- **Business Leader.** A Business Leader is an individual educated in TEO and in charge of growing the E&C business. This leader has substantial business knowledge and uses it in order to find and create opportunities where the company can successfully perform. He/she is under the direction of the Big Business, which can be a country subsidiary or a department that specializes in certain types of businesses.
- **Decentralization.** Decentralization occurs when the Business Leader structures a Small Business for each project and assumes full responsibility for client service, team motivation and over results, in consensus with the Big Business. These are the basis for the growth strategy which puts them in constant contact with the client and the needs of the client.
- **Planned Delegation.** Planned Delegation allows the construction of a modular dynamic structure centered on client requirements. It allows simple methods for productivity and business creation that keeps the projects flexible, specialized, and integrated in TEO.

The TEO acts mainly at the ethical organizational level, which is the one the company should develop to achieve its mission. It contains the philosophical principles of the company over time and is what makes the company live and grow. OE&C considers that the organization should be quick and efficient in its wishes and communications. In order to achieve this, the organization should simply flow and re-flow the decisions and results throughout its structure, instead of having them merely go bottom up or top down. It is the TEO's responsibility to facilitate this natural flow.



The culture of the TEO is based on the process of Identification, Creation, Conquer and Satisfaction of the client, conceived from an organizational structure intelligent with skills to acquire, to create, to exploit, to accumulate and to transmit new knowledge in a constant and dynamic process, generating the called "spiral of knowledge" (NONAKA & TAKEUCHI, 2003).

**a- Big Companies.** They are Business Units, such as the Petrochemical department, E&C, Tourism, and they offer support and infrastructure to the Small Companies (e.g.: a subsidiary in a State in the USA).

**b- Small Companies.** They are formed for each new project or activity and are under the direction of a Business Leader. Their organization is decentralized and has a planned delegation, guided under a mutually agreed plan that flows from the shareholders (Annual Level). The TEO possesses an incentive device that allows the members of the projects (Small Companies) to obtain earnings from their innovative activities. These innovative activities are carried out once the bids have been won, including innovations of processes and technological system to reduce costs. The saved difference between the bid and the resulting innovation is distributed among the participants of the project (e.g.: the project of an off-shore platform in Spain).

**c- Center of Communications.** It is a flexible and integrated system between the Small and the Big Company. The challenges derived from the decentralized performance of OE&C have been overcome because of this center. People who possess knowledge have skills to evaluate the projects and to identify the flaws; they also suggest actions to optimize methods and to adopt technical solutions successfully implemented in other contracts. In this center, it can be identified: 1 - the client and the business, 2 - the managerial purposes with this client; 3 - the services, technologies and goods that should be given to satisfy his specific client; 4 - how to provide better services and goods; 5 - how to negotiate results, terms, prices and therefore become customizable; 6 - Planned Delegation (activities, results, terms and responsibility); 7 - different physical and organizational initiatives to create the flow of communications among all those involved.

**Current functionality of the TEO.** It can adapt to the increasingly common unforeseeable explosions in the market and preserve a strategic perspective inside a frame unified in all the countries where OE&C acts. The Planned Delegation allows that the teams have a clear definition of the objectives, and qualitative and quantitative results expected in each stage and for each member. Thus, this Planned Delegation is entitled duties with strategic autonomy determined by the annual

plans of the participant areas and strategies of business created by leaders and shareholders through the TEO and in return they are rewarded materially by the innovations made for each project.

The inventory includes both the successes and the failures, which are documented and analyzed (Awarding for the Results). In the Center of Communications the new knowledge acquired in that project is recategorized and recontextualized. The members of the team return to the level or layer of the business system (Big Company) and they are devoted to day-to-day operations until they are called again for another project (Small Company). Therefore, the content of the knowledge accumulated in the bureaucratic layer is different from the one generated in the project team. If the first tends more towards combination and internalization, the project teams generate understandable knowledge (route socialization) and conceptual knowledge (route externalization). It is shown that the organizational structure of OE&C is like the organizational structure proposed by NONAKA and TAKEUCHI (2003), the Hypertext organization.

**Chart 3:** Similarities between the Hypertext organization and OE&C organization

<b>Hypertext Organization</b>	<b>OE&amp;C Organization</b>
Bureaucratic layer	The organization manages its market operational and economical commitment, in the short and half term (Great Company);
Work teams or task forces	It establishes the priorities in the half and long term, especially when they deal with projects of innovation in processes or products (Small enterprise with a Management Leader and his project team);
The reception, storage and transformation of knowledge	The receipt, storage and transformation of the existing knowledge with common values and knowledge through the participation of all the members of the organization with a common intention or objective (Center of Communications and the delegation planned across the TEO timetable previously agreed for every project).

**Source:** Authors

This, among other circumstances, is what allows OE&C to control strategically the lock-in in their organizational structure for innovation. The organizational structure used by OE&C is identified starting from the multi-variant statistic analysis of the data picked up in 5 countries and from the interpretive analysis with the different organizational structures for innovation. It allows establishing some differences and similarities among them, and comparing them with the reality of the company focus study.

**Chart 4:** Analysis of the organizational structure for OE&C

<b>Principal mechanism of adjustment / coordination</b>	
Clover	Normalization of the results with the skills
Federal	Shared identity
Triple I	Intelligence and organizational learning development
Adhocracy	Mutual adjustment
Hypertext	Identity and shared values
OE&C	Odebrecht Entrepreneurial Technology – TEO
<b>Structure</b>	
Clover	Decentralization and specialization. Organizational design depends on each part. Several link and coordination mechanisms
Federal	Federalism and not decentralization; few levels; alliances; evolution of the divisional model; Flex
Triple I	Decentralized, flexible and highly specialized
Adhocracy	Decentralized; not defined habitual divisions; experts grouped in project teams; numerous link mechanisms.
Hypertext	Several levels or interconnected contexts: nested bureaucratic structures; project teams. Hierarchical organized structures complementary to the formal structure.
OE&C	Holding; Great Company; Small enterprise, Center of Communications.
<b>Fundamental part (report) of the Organization</b>	
Clover	The nucleus of permanent workers
Federal	The center
Triple I	The nucleus management
Adhocracy	Support staff and nucleus operations
Hypertext	The knowledge base
OE&C	The Managerial Leader. Strategy of identification of client by means of the TEO and technical platform.
<b>Context</b>	
Clover	Dynamic, complex and competitive environments
Federal	Diversification and internationalization
Adhocracy	Complex and dynamic environments
Hypertext	Diversified, dynamic, complex and competitive environments
OE&C	Project teams formed with the best technical personnel in the areas. Better salary and work environment produce high selectivity of professionals. Easy adjustment to joint-venture in projects abroad. Division of the earnings among the members of the team to leave of the innovation.
<b>Features</b>	
Clover	Technical sophisticated system. Multiple powers. Professionalization and collaboration. Flex
Federal	The power of the center is granted to the parts. The center advises, coordinates, influences and suggests. The initiative, the orientation and the energy come from the parts.
Triple I	The power of the nucleus must be gained through respect, leadership and knowledge.
Adhocracy	Sophisticated. Democracy without bureaucracy. Highly innovative organization
Hypertext	Highly innovative organization. Coexistence of three different levels in the same organization. Capacity of the members in rapidly changing context.
OE&C	The innovation is part of its structure and designed to satisfy the client. The Center of Communications also must be an innovator in planning to conceive the distribution of the results of this innovation. Development and technological improvement. Performance in 3 levels.
<b>Disadvantages</b>	
Clover	Difficult to coordinate. Control problems. Identification problems within the organization
Federal	Difficulty at exercising control. Strong instability
Triple I	Difficulty at the moment of directing. Delicate process of recruitment
Adhocracy	Ambiguity problems. Conflicts between experts. Processes not formalized.
Hypertext	Difficulty on transferring tacit knowledge in companies with many units in different countries

	and with different cultures. Problems regarding human resource policies (systems of evaluation, promotion, etc.)
OE&C	Since every project is different not in all the same event is producing antagonisms

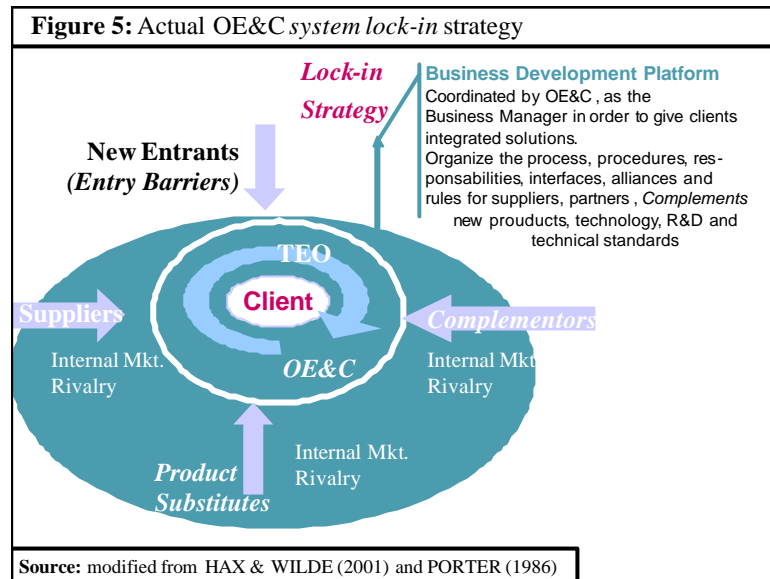
**Source:** Authors

## 5. Final Considerations And Conclusions

The first methodological analysis realized with the Delta model allows the description of the different strategies of OE&C in its historical process. In the period between the 1940s up to the 1970s, it used the strategy of the best product. In the 1980s and 1990s the focus was the strategy of Solutions Orientated towards the Client. Nowadays the company uses the lock-in system strategy which, by creating a technical-commercial platform, allows the grouping of all those involved in a project.

In order to create and make work this technician-commercial platform OE&C applied the lock-in system strategy and worked like an organizational structure for innovation. This platform allows acting successfully in an international competitive system marked by the multiplicity of interrelations among employees, clients, suppliers, teams, procedures and processes. Inclusive for each project in any country of the world, the binomial TEO and system lock-in allows the coordination and the harmonization of a platform of synergy to all the involved elements.

According to Porter's 5 Competitive Forces theory, the structure and operation of the current strategy of OE&C resembles that presented in figure 5. The synergy of the platform allows leaving out the competitors, whereas the suppliers and complementers continue dependent on the internal rivalry.



Thus, the analysis of the historical evolution of the OE&C revealed that the strategies used by the company have had and have its bases in the TEO. Undoubtedly, this philosophy made OE&C one of the few companies in Latin America that was able to act successfully for 55 years in the national market and for 23 years in the international market. At the moment the most distinctive characteristics in the TEO allow the company to converge with the different organizational structures aimed at innovation. The organizational structures guided to innovation are the mechanisms of adaptation that incorporate into the processes to assure the flexibility and to allow the strategic change in an uncertain and competitive market as the current one. This organizational functionality is characterized by the fast evolution in compatibility with the resources of the present and the course of the strategic future of the company (HAX & WILDE, 2001). This way, for example, the functionality of the Big Companies, of the Small Companies and of the Centers of Communications allows the generation of what is called "hairspring knowledge".

The structure and functionality of hairspring knowledge is extended to different branches, and eased by the system lock strategy in order to maintain the success of the particularities and demands of the different markets in which the company acts. That way the TEO responds successfully to the current challenges of internationalization, broadening the spectrum of strategic positions for each specific market by means of organizational structures guided to innovation and the system lock-in strategy.

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