

Nº 83

**STRATEGIC MANAGEMENT OF CLUSTERS:
THE CASE OF THE CHILEAN SALMON INDUSTRY**

Carlos Vignolo F.
Gastón Held B.
Juan Pablo Zanlungo M.

**DOCUMENTOS DE TRABAJO
Serie Gestión**

Strategic Management of Clusters: The Case of the Chilean Salmon Industry

Carlos Vignolo F. (+)
Gastón Held B. (++)
Juan Pablo Zanlungo M. (+++)

Paper to be presented at the
Second International Conference on Strategic Management in Latin America
Cosponsored by the School of Management, Catholic University of Chile (EAPUC) and the Journal of
Business Research
Santiago de Chile, January 4th to 5th, 2007

Track:

3. Strategy formulation and execution in Latin America: Managing changes of strategy, structure and organization

- (+) Associate Professor, Director of the Technologies for the Construction of Social Capital Program, Industrial Engineering Department, University of Chile. Phone: (56 2) 978 4028; fax: (56 2) 689 7805; e-mail: cvignolo@dii.uchile.cl
- (++) Adjunct Professor, Director of the MBA Program, Industrial Engineering Department, University of Chile. Phone: (56 2) 978 4020; fax: (56 2) 689 2905; e-mail: gheld@dii.uchile.cl
- (+++) Consultant, Part time Professor and Professional Associate, Industrial Engineering Department, University of Chile. Phone & fax: (56 2) 378 0911; e-mail: jzanlungo@kmt.cl

Strategic management of clusters: the case of the Chilean salmon industry

ABSTRACT

Over the last two decades the Chilean salmon cluster has shown remarkable development. However, it is currently facing complex menaces that have become difficult to manage at the strategic level. This article highlights the role of social capital in the cluster's emergence and rapid growth and also in the generation of the complex situation it is presently going through. A strong argument is made in the paper about the crucial importance of the process of generation and administration of social capital, as central part of the strategic management of clusters.

KEY WORDS: Cluster, strategic management, Chilean salmon industry, social capital

1. INTRODUCTION

The Chilean salmon industry has undergone an extraordinary economic evolution -by whatever measure- in the last 20 years. It has grown rapidly from 1986 when it produced and exported US\$ 5m to its current worth of more than US\$ 1,700m (2005). Today it is the largest producer of cultivated salmon –a position for which it competes with Norway– with around a third of world production. In this process Chilean entrepreneurs have competed with and replaced firms of countries with higher relative development.

An outstanding feature is the essentially endogenous character of this process –pushed by national and local entrepreneurs– with relatively little state participation. Within their region, they have developed what is normally understood as a cluster -that is, a geographically concentrated complex of producers

that generate co-operation among themselves and facilitate the development of suppliers of previously unavailable inputs and services, all this with a significant level of local innovation. This is a unique occurrence in Chilean history.¹

Despite this success, the Chilean salmon industry is having a number of social validation problems. Certain practices, styles and ways of behaving are increasingly questioned by labor, environment and political groups. Apart from the difficulties they imply for operations, these issues could potentially affect its development, especially in export markets which are both well informed and demand compliance with appropriate standards.

This paper's main object is to present a number of related interpretative proposals about the salmon cluster's success and the challenges it currently faces as well as proposed actions to deal with them, paying particular attention to social capital and its relation to strategic management. Given the scarcity of hard information available, the scarce number of studies about this issue and the incipient literature on clusters in countries similar to Chile, the paper does not pretend to establish definitive proposals but rather an agenda for research and development on this industry, with a perspective which differs from previous work done about it. From an examination of this experience and the increasing role given to clusters in economic development, the paper proposes generic elements for long term strategic management of these conglomerates as well as future research issues.

¹ Montero, C. (2004).

2. CONCEPTUAL FRAMEWORK AND MAIN INTERPRETATIONS

Strategic management and the construction of social capital – keys to cluster development

The main conceptual premise of this paper is that the central factor for the sustainable and harmonious development of enterprises -and human and social organization in general- is the social capital endowment they can command. Our view of social capital is broad -it is understood as the capacity to generate value in a social organization from interactions and the strengthening of its members' potential energies and capacities around a common objective within a shared values framework.^{2,3} One of the central thesis of this article is that social capital can be constructed in cultural contexts which possess little, at high rates over relatively short periods of time.⁴

We argue that another key factor for the development of organizations is strategic management, understood here as the set of conscious and deliberate design and execution processes -from the generation of vision, mission and values to their implementation, follow up, evaluation and continuous redesign of strategy, structure, policies and projects- that allow the system as a whole to evolve from its initial situation in the desired direction over the long term.

As a corollary of the above, we postulate that the strategic management of every human organization ought to have as one of its main concerns to assure an endowment of social capital closely related to

² What Jim Collins would call a core ideology (in Built to Last, 1994).

³ From this perspective, social capital is made up of four components (Vignolo et al., 2002 and 2003):

- i) Human capital: the capacity to act by the nodes of a social network (persons) and in particular the capacity to produce value in collaboration with others.
- ii) Relational capital: the quality of the collaborative network in which each person functions, in terms of quality and quantify.
- iii) Environmental capital: the quality of the social contexts in which people interact to produce value.
- iv) Directional capital: the existence of a mission and a sense of mission that empowers, mobilizes and guides people and organizations.

⁴ By conversational processes of “transformation in coexistence”, with direct interaction between people and emotional participation. See for example, “Breakthrough leadership”, in the first special number in its 79 years of the Harvard Business Review (Dec. 2001), which proposes to “break the interpersonal barriers that impede genuine human contact”.

the complexity and dynamism of the organization and to the specific relevant context in which it develops. We adopt in this analysis the premise that human organizations increase their complexity as they evolve and grow.

Clusters are understood to be a group of geographically specific firms and institutions, with both common and complimentary characteristics, linked by mutual dependence in the supply of specific goods and services. It appears as an integrated production system, within which there is an important network of relations where both co-operation and competition coexist. It is made up of a large range of mainly specialized actors -intermediate or final goods and services producers; firms that supply inputs, capital goods, financial services etc.; distribution channels or clients; training institutions; relevant research organizations; and public organizations involved in the development of cluster activities. Their permanent and varied interactions are crucial for the achievement of positive results -in terms of greater productivity and innovation- and competitiveness that allow the system to last over time.

Different stages of cluster development can be recognized, mainly by having as a reference the traditional management practices of the business environment in which it evolves. The simple co-existence of firms in a specific geographical location is not enough to constitute a cluster. Clusters evolve over time, and dynamics of the interactions between the constituent actors may change.

Our view is that non market and non hierarchic relations are key in cluster development and sustainability, and thus the importance of social capital. Trust is the glue that keeps clusters together. It is also the main component and the clearest proxy indicator of social capital.

Our interpretation is that even more than economic, structural and rational factors, the construction of social capital was a key factor in the emergence of the salmon cluster in Chile, and that the cluster's

present difficulties are due mainly to its deterioration, which has not been properly accounted for - among other things because there are no metrics- nor sufficiently compensated by improved strategic management. Moreover, it can be argued that even the cluster's strategic management capacity has been weakened, in large part due to the deterioration of social capital among its leaders.

3. THE RISE AND FALL OF CHILE'S SALMON CLUSTER

Facts and an interpretation from the social capital perspective.

a) Facts

Chile's salmon industry has experienced a very rapid and significant development over the last 25 years. In 2005 it exported 384,000 tons earning US\$ 1,721 m., transforming the country into becoming the largest trout exporter and second salmon exporter. Total investment over the same period was about US\$ 1,800 m. Salmon is Chile's third most important and the main renewable export. The industry has created around 53,000 direct and indirect jobs and has had an important impact on the region where it develops (located around 1,000 km to the south of Santiago). This is an impressive outcome, when taking into account that at the beginning of the 1970s it hardly existed and that salmon is not a native species; its production had to be learnt and adapted to Chile's conditions.

Chile's initial salmon production began in the early 1980s and averaged about 10 tons annually. In 1982, the Chile Foundation (*Fundación Chile*), a public-private institution for the promotion of new productive sectors, established a pilot salmon production firm to show the commercial viability of this activity. Production was mainly based on small companies with national investment, imitating foreign technology (particularly from Norway and Great Britain). Growth was rapid: in 1989 output amounted

to 10,000 tons (seventh world producer with 4% of the market); by 1994 it was 100,000 tons (second world producer with 18% of the market); in 2000, production had reached 300,000 tons (27% of the world market); in 2002 it reached 500,000 tons; and in 2005 it exceeded 600,000 tons, (38% of the world's farmed salmon and trout production).

Although foreign investment has always been part of the industry, it was not until 1999 that it accounted for 18% of production when two important Norwegian companies acquired local firms. Foreign investment has increased since then with the entrance of additional companies.

Co-operative relations between companies were established early. In 1986 the Chilean Salmon and Trout Producers Association (*Asociación de Productores de Salmón y Trucha de Chile*) or APSTCH A.G. was formed to co-ordinate the industry. From the start on the Association supported common initiatives such as a national quality program (1987), phytoplankton monitoring (1988), seminars and international promotion campaigns. Its leadership was instrumental in the creation (1995) of the Institute for Salmon Technology (*Instituto Tecnológico del Salmón* or INTESAL), which co-ordinates sector research and training. In 2002 the Association opened the membership to associated activities such as packers, food producers, transport companies and others, and changed its name to Chilean Salmon Industry Association (*Asociación de la Industria del Salmón*) or *SalmonChile*.

During its existence, the industry has had to face different charges concerning its commercial as well as its sanitary and environmental practices. For example, North American producers complained about dumping in 1997; environmental concerns have been raised by non governmental organizations (NGOs) particularly since 2000; and recently restrictions on antibiotic use were imposed to meet the norms of the main export markets. In response, the industry has been pro-active when faced with these issues, mainly coordinated by *SalmonChile*. Among these responses was the signing of a clean

production agreement with the government in 2002; the establishment of the Salmon of the Americas (SOTA) alliance together with American producers to promote salmon consumption there; and from 2005, the development of an Integrated Management System (*Sistema Integrado de Gestión*) or SIGES, a set of verifiable standards and procedures with international acknowledgement to guarantee a safe, quality product in terms of food, labor and environment. In 2005, CORFO, the government development agency, began a program to support the salmon cluster known as the Integral Territorial Program (*Programa Territorial Integrado* or PTI).

The industry has experienced a growing number of mergers and acquisitions to achieve economies of scale and vertical integration. Ten years ago there were over 100 salmon and trout firms – now there are around 40. A similar process is occurring in other regions of the world, and has also had local impacts due to the presence of foreign companies. A commercial sophistication has resulted in new products with higher value added (for example, steaks fillets) and export market diversification. There has also been an increase in investment diversification toward specific types of shell fish to take advantage of economies of scope. However, on the other hand, questions about the industry's environmental and labor practices have intensified.

b) Interpretation

How is it possible that this development occurred so quickly and successfully in an industry mainly associated with developed countries, without a significant state participation and in a cluster format in a country historically marked by “foreign enclaves” and low trust levels⁵, the glue of clusters?

⁵ “The World Values Survey 1995, 1997” (Institute for Social Research, U. of Michigan, 2000) shows the relatively lower level of social capital in Chile compared to other countries, and “Panorama social de América Latina” (“Latin America’s social panorama”) (PNUD, 2002) shows the negative internal distribution of social capital. Both studies build indicators based on polls, which refer to people’s trust in others, interest in policy issues and associativity.

Main interpretations of this successful development have tended to focus on natural comparative advantages (climate, oceanographic); favorable economic conditions (stable macro-economy, export orientation, etc.); and the availability of cheap labor. Acknowledging these issues, in this essay we hold that the main factors that concurred to allow this remarkable process are related to the field of leadership, emotions, values and the dynamics of relations between cluster actors -that is, to the territory of social capital- and that the salmon cluster is an interesting case of the trilogy of “ideals, values and emotions”.⁶

More specifically, we propose that the main elements that mark the rise of Chile’s salmon industry and cluster are⁷:

- i) the pioneering spirit of a group of entrepreneurs, mainly professionals who migrated from the country’s center and settled in the salmon region, hoping to use the comparative advantage of Chile’s southern oceans (aquaculture and fishing) and the policies that encouraged exports and regional development.⁸
- ii) the willingness and capacity to collaborate among themselves in this work, partly motivated by their limited experience and knowledge of this activity, geographic isolation, the precariousness of work conditions and the absence of dominant firms.
- iii) a clear understanding of the positive and negative externalities that need to be internalized through co-operation and permanent contact and communication.
- iv) the need to collaborate in order to organize the minimum conditions necessary for them and their families in education, health, recreation, and other fundamental services.

⁶ Proposed by Nonaka & Takeuchi in The Knowledge Creating Company (Oxford University Press, 1995) as the key elements to explain innovation in Japanese firms.

⁷ This section has been much helped by Gutiérrez, J. R. (2004). Mr. Gutiérrez is the president of Multiexport, a major producer, and past president of the Producers Association.

⁸ Not a few were hoping to abandon the stress and smog of Santiago, the capital city, where around 30 per cent of the national population lives.

- v) the need to unite and generate a critical mass to face shared challenges and threats such as their commercial position in export markets, resolving administrative and legal issues with public authorities, etc.
- vi) the need for inputs and services, which led to the development of local suppliers.
- vii) the need for “industrial workers” in a predominantly agricultural, cattle and small fishing region.

All this constitutes a foundational situation, in which the tendency to cooperate is high. The way to address these needs and requirements is “dialoguing” (in Peter Senge’s sense). This generates trust, mutual knowledge, relations, attitudes and a spirit which are the soul of a cluster. If the contextual conditions allow, necessity is the mother of invention. In this case the needs created the cluster, fundamentally through a pioneering spirit and the collaboration of the main leaders during the industry’s early phases.

Initiatives such as the early creation of the Producers Association in 1986, the generic promotion campaign of Chilean salmon in the USA pushed by the Association in 1994, and the creation of the INTESAL in 1995, that may not come as a surprise to researchers from other countries, are very infrequent in Chile, where associative practices have been historically very weak. So it is possible to put forward the thesis that we are in the presence of a case of rapid social capital accumulation where, additionally, the created associativity allowed tackling complex issues belonging to the strategic management domain, such as the joint positioning in previously non existent markets.

On the other hand, this pioneering situation and the entrepreneurial spirit, together with the collaboration among founders, led to a management style that can be characterized by a focus on “stakeholders” and a sense of mission, distinct from the traditional style aimed at “shareholders” and

“profits”.⁹ Coexisting in the territory with relatively small communities was probably a fundamental factor in generating also a “humane” style in the area of personnel management, in contrast to the more traditional hierarchic and bureaucratic style, until today by far the most common in Chile.

4. TURNING POINT: THE INDUSTRIALIZATION OF THE INDUSTRY AND THE DECLUSTERING OF THE CLUSTER

As the industry has successfully consolidated and matured, the nature of the cluster has changed. As output continues to grow, the social capital of the cluster would appear to have diminished or at least not to have grown at the required rates, in spite of the increasing needs for associativity linked to the greater complexity and visibility of the sector.¹⁰ The industry faces numerous and increasingly organized opponents with a capacity to influence regional, national and international opinion. A clear demonstration of the growing weight of these positions is the recent special session called by the lower house of Chile’s Congress (*Cámara de Diputados*) to discuss criticisms of salmon farming (an infrequent practice in Chile) which then formed a Special Commission to investigate and propose measures regarding these issues.

We propose, as a tentative hypothesis, that the following are the fundamental factors that explain the deterioration of social capital and the public image of Chilean salmon farming:

⁹ Chaiton et al., 2000.

¹⁰ It is most likely that social capital has declined in absolute terms, however this cannot be proved because of the lack of information.

a) Industrial organization

- i) Increase in industrial concentration and significant increase in the average size of producing firms through mergers and acquisitions.¹¹
- ii) Increase in vertical integration.¹²
- iii) Incorporation of foreign companies integrated to final markets, aiming at low cost production for the first stage of their value chains.
- iv) Increase in entry barriers, by volume of capital required and access difficulties to marine concessions, making it more difficult for smaller local entrepreneurs to participate in the industry.

As a whole these factors have reduced the need for collaboration among producers, “commercialized” relations with suppliers and “industrialized” labor relations.

b) Industrial dynamics, associated with the cluster’s national and international visibility.

- i) The focus on rapid growth and size of the leading companies has created imbalance in their relation with the environment, which has not been taken care of until recently as a main strategic concern for them.
- ii) The international significance acquired and the arrival of large Norwegian companies seem to have meant a sort of “import” to Chile of developed countries detractors to salmon production and an increase in the social responsibility standards expected from salmon companies.

¹¹ In 1995, the ten largest firms accounted for 44.3% of exports, increasing to 50.7% in 2000 and then to 74.2% in 2005 (including firms with a common owners).

¹² Both waters above and below. E.g., in 1993 25% of the main production companies owned their own hatcheries and 50% their own commercial distribution channels; in 2003 the respective figures were 84 and 100% (Gutiérrez, J. R., 2004).

c) Cultural factors¹³

i) Envy. “Chaqueteo”, a common and generalized tendency to belittle peer’s achievements, is one of Chile’s most negative cultural features; instead of the desire to learn and emulate, it often derives in destructive comments or actions. It has to be considered seriously when trying to explain the growing criticism to salmon industry, even within the entrepreneurial sector; its relevance has very likely increased because of the industry’s rapid and visible success.

ii) “Ego trip”.¹⁴ Another frequent Chilean feature is the evolution towards egotism among achievers in different domains. It is apparent that the tendency to cooperate, communicate openly and trust each other has diminished among the initial salmon industry’s pioneers.

iii) Centralism. Chile is an authoritarian, hierarchical and centralized culture. As with many other developing countries, the bulk of Chile’s economic activities, public institutions, quality education and diverse cultural and recreational activities have been concentrated in the capital city. We propose centralism has negatively affected recent cluster development in at least the following ways:

- emigration to the capital of many of the business pioneers with their families, so breaking the existing relationship between them, local communities and workers, company middle management and trade union leaders.
- the weakness of regional governments to deal with specific requirements of a sector becoming more and more distinct and complex when compared to other national regions. Regional governments are dependent on central levels (for example, the definition of priorities) and lack sufficient technical capacity and the minimum continuity over time needed to build trust with the various actors that make up a cluster.

¹³ These points are exploratory. We think the factors mentioned here ought to be the subject of more research not only for the salmon cluster but for clusters, strategic management and organizational development in general.

¹⁴ An idea used by Carver Mead, Emeritus Professor (Caltech) and himself an active participant in Silicon Valley’s development, to explain business failure (Puerto Montt, January 2006). This refers to the way in which some business leaders assign a particular role to their leadership for the company’s and even industry’s success and from which unfolds a generally unfavorable change in leadership and management style.

d) Change in management style

The growth of firms and their consequent professionalization, that is the incorporation of a large number of professionals frequently with no previous relation to the industry, has brought a change in management style when compared to the founders. The new style is more traditional, hierarchic, depersonalized, and influenced by profits and shareholders. This has affected the quality of relations both with suppliers and workers.

All the above mentioned factors, and the loss of social capital that they imply, debilitate the cluster's strategic management capabilities in different ways:

- make it increasingly more difficult to deal, design and agree on strategic issues, urgently needed given increasing complexity of the cluster as a whole and of the challenges it faces.
- lead the overall coordinating actions of *SalmonChile* to be more tactical-operational rather than strategic, and more reactive than proactive, because it is easier to achieve such agreements among members of industry and cluster, including Board of Directors members.
- make important organizational issues fall into "blind spots" and therefore very difficult to take care of. Two clear examples are:
 - the current institutional decision structure does not consider the interests and contributions of all stakeholders. *SalmonChile* is mainly a producer's organization and although suppliers have been able to become members for some years, they are not represented on the Board. Neither are interested social groups -trade unions, environmental organizations or coastal communities part of the Association. This obvious breakdown for cluster management has not gone into *SalmonChile*'s agenda yet.

- the appointment of the principal decision makers (basically the SalmonChile Board) is mainly based on their firms' importance and their positions rather than their ability to face challenges or their individual and complementary competencies. There are no defined accountability criteria.

5. TCSC AND THEIR APPLICATION TO THE SALMON CLUSTER. Successes and failures.

In 2004, the Salmon Industry Association signed a framework agreement with the University of Chile's Faculty of Physical Sciences and Mathematics for the Department of Industrial Engineering (DII) and other academic units to collaborate in the identification and design of actions to face the industry's increasing strategic challenges.

From this grew the Program for Strengthening Social Capital in the Chilean Salmon Cluster (*Programa de Fortalecimiento del Capital Social del Cluster del Salmón*) organized by the Program of Leadership Abilities (*Programa de Habilidades Directivas* or PHD) and the Program of Technologies for the Construction of Social Capital (*Programa de Tecnologías de Construcción de Capital Social* or PTCCS). The program's anchor is the Diploma in Leadership Abilities for the Salmon Cluster (*Diplomado de Habilidades Directivas para Líderes del Cluster del Salmón*), whose main objectives are:

- to increase the interpersonal and leadership skills of those who play important roles in the sector's producing and supplier companies as well as the relevant national and regional public organizations.
- to create circumstances that increase trust, interpersonal relations and networks among participants.

- to identify together the cluster's "limiting paradigms" (*paradigmas encadenantes*) and "major breakdowns" (*quiebres maestros*) and design actions and projects to deal with them, learning how to transform problems into innovation opportunities.¹⁵

The first version of this innovative program for the construction of social capital took place between April 2005 and January 2006. It was well evaluated by the nearly sixty participants, which included important stakeholder representatives, among them the President of a leading company and the past President of *SalmonChile*, the Undersecretary for Fisheries, the National Director of the National Fishing Service (*Servicio Nacional de Pesca*) -the sector's monitoring agency- and many high level company executives and public directors.¹⁶ This program confirmed the current weakness of the cluster's social capital, illustrated by the participants' identification of "lack of trust", "lack of a common goal", "poor communications", etc. as "major breakdowns"¹⁷, and "success" a one of the main "limiting paradigms".¹⁸

The Diploma was instrumental for the increase of trust, communication and the feeling of community among participants. However it was not so successful in establishing participant owned long term projects to tackle these failures. This directly relates to the problems that the cluster faces -lack of trust, skepticism, and little commitment to common projects.

¹⁵ See www.phd.cl for more information.

¹⁶ Statements available at <http://phd.cl/dhds/calendario.php>.

¹⁷ Participants' consensus on the main "major breakdowns" included: lack of capacity to anticipate and react to protectionism in export markets; mistrust, lack of a shared vision and commitment in the cluster; vulnerability to increasing food safety requirements, low educational level of labor, rigid and authoritarian culture as the main factors at industry level; lack of integration, bureaucracy and overwhelming regulations at the public level; community's criticism regarding social, labor and environment practices, and lack of compatibility in the use of territory (small fishing and tourism).

¹⁸ As the main "limiting paradigms" of the salmon cluster, participants identified the industry as a sustainable activity in coexistence with others; consciousness of being an entrepreneurial and innovative industry; the contribution it makes (salmon is healthy; the industry is the basis of regional development; it is competitive); and the worth of cooperation. The main "limiting paradigms" identified were the lack of national technological development; low salaries; feeling of success; and pollution generated by the industry.

The Program for the Strengthening of the Salmon Cluster considers a number of activities additional to the Diploma, among which are local seminars, leadership and innovation workshops and thematic roundtables. Recently the program's progress has been weakened by a number of different factors, among which is the recent change in Chile's government with new public officials unfamiliar and cautious with these initiatives, as well as changing the policy focus from economic growth to the "social agenda". As a result there is less public policy attention being paid to the social and political sustainability of salmon farming. So too some of the largest firms have been reluctant to participate in the program. All this would seem to confirm the unfavorable evolution of social capital which, in addition to SalmonChile's weakened awareness, will and capacity to intervene with a strategic management perspective, could be affecting negatively the cluster's management capacity and might bring risks for its sustainability and projection over time.

6. CONCLUSIONS AND RECOMMENDATIONS

The case study, together with direct knowledge acquired from various activities with cluster participants, is the basis of the following conclusions and future research suggestions.

a) The Chilean salmon cluster

- Social capital played a central role in the initial stages of cluster development. However, it has not evolved at a similar pace, which, together with the associated relatively low levels of trust, have negatively affected the cluster's strategic management capabilities and must be overcome to properly face current challenges.
- The current institutional structure does not represent all stakeholders and so reduces the possibilities of joint actions, leads to conflicts, sometimes in extreme ways, and as a result limits

the potential for co-operation and innovation. Even if SalmonChile allowed the incorporation of suppliers, these, being a larger number, have no participation in the board. Altogether, this situation is generating a latent governance crisis and should be changed. One possibility is the design of an overarching co-ordination structure of which SalmonChile would be an important component as representative of producers.

b) Clusters in general

- As cluster co-ordination depends mainly on goodwill and participant's dispositions, rather than compulsion, then an appropriate level of social capital (and trust) is necessary to allow effective strategic management. Therefore encouraging social capital ought to be one of management's central concerns. It should be considered that this need increases over time, as a result of the cluster's development and the evolution and increased complexity of the interrelations between participants and with the cluster's environment.
- The satisfactory development of a cluster requires effective co-ordination capability of the main actors with the sufficient legitimacy to make decisions for all. The leadership should be representative of different interests, and skilled in managing challenges (including the articulation of interests and actors). A cluster is a complex "business" that needs to be managed strategically.
- Clusters present a broad range of industrial organization issues which arise as attractive research themes. These could include:
 - The convenience of absence of dominant firms in the early growth stages of clusters.
 - The relationship between the development of a cluster and its main positive characteristics (co-operation, innovation, etc.). It could be that when moving to mass production, the cluster's success itself results in a more traditional industrial structure (vertical and horizontal integration, dominant players, and emphasis on costs, margins and shareholder value). This is one possible interpretation of the recent experience of Chile's salmon cluster.

- Another future research issue refers to the evolution of strategic management needs and action range as the cluster develops. A related issue to be considered are the changing requirements of institutional arrangements in this process.

The experience acquired by DII in the salmon industry, together with previous work in different companies, industries and regions in the country, has allowed to enrich and to tune the social capital building technology (“sociotechnology”) and its integration with the theory on which it rests. Some interesting results have been the confirmation of Diplomas as effective social capital building spaces, whose contribution improves with a proper selection of participants to help the development of trust and networks inside the respective organization or community; the convenience of considering follow-up activities to keep up the relationships and new practices established, which tend to debilitate influenced by traditional ways of doing things; and the convenience of including tools to measure social capital, to allow a more precise evaluation of the contribution of these interventions and its evolution over time. In clusters, where associative practices play a central role, sociotechnology’s contribution to the establishment and strengthening of trust and relationships needed for their development is of special interest.

Strategic management has a new and propitious field in clusters. Even more than in companies, where it is also increasingly evident, new and more powerful paradigms are required that take into account more than rational and structural dimensions. Cultural factors can no longer be ignored. Strategic management of cluster requires to simultaneously and harmoniously deal with structure and culture. The good news is that we know -or at least have good reasons to believe- that cultures, including social capital, are capable of being transformed, which opens a fascinating new perspective to the practice of strategic management.

New developments, paradigms and tendencies in management that focus on the emotional and spiritual dimensions of human behavior will be of great help in dealing with these challenges. As Harvard Business Review, following Peter Drucker's seminal "Managing Oneself" 1996 paper, has repeatedly highlighted in recent years, management of the future will need "...*breaking through old habits of thinking to uncover fresh solutions to perennial problems*" and also "...*breaking through the interpersonal barriers that we all erect against genuine human contact*".¹⁹

Especially for cluster understanding these developments will be of great importance. Clusters are over all processes of building new realities through new connections among very different types of organizations and human beings. A more human approach to management will therefore shed light and facilitate cluster research and management.

REFERENCES

1. Andriani, P. et al. (2005): "Challenging clusters. The prospects and pitfalls of clustering for innovation and economic development", summary report. Welsh Economic Research Unit and Advanced Institute of Management Research.
2. Chaiton, A., Paquet, G., Roy, J. and Wilson, C. (2000): "The schizophrenic corporation: corporate governance in a clustered world". Discussion paper presented to the Competitiveness Institute 3rd Annual Conference, Clusters in the New Millennium, Glasgow, Scotland, October 2000.
3. Gutiérrez, J. R. (2004): Presentación realizada en el Primer Taller Innovación y Construcción de Capital Social en el Cluster del Salmón, Puerto Montt, agosto de 2004.

¹⁹ Harvard Business Review, Special Issue, December 2001, "From the Editor".

4. Ickis, J. (2006): "Building a national competitiveness program". *Journal of Business Research* 59, pgs. 341 – 348.
5. Iizuka, M. (2004): "Organizacional capability and export performance: The salmon industry in Chile". Paper (first draft) to be presented at the DRUID Winter Conference, Jan. 2004
6. Ketels, Christian (2003): "The development of the cluster concept: present experiences and further development". Prepared for the NRW conference on clusters, Duisburg, Germany, Dec. 2003.
7. Montero, Cecilia (2004): "Formación y desarrollo de un cluster globalizado: el caso de la industria del salmón en Chile". Serie Desarrollo Productivo N° 145, CEPAL.
8. Vial, C. (2006): "La salmonicultura en Chile: el empuje que sobra y las confianzas que faltan" ("Salmon industry in Chile: drive surplus and trust lack"). Presentación realizada en el II Seminario "Chile, potencia alimentaria", Septiembre de 2006, en su calidad de Presidente de SalmonChile.
9. Vignolo, C. y Potocnjak, C. (2002): "Construyendo capital social en la región de Aysén, Chile: hacia una interpretación del desarrollo como fenómeno conversacional" ("Building social capital in the Aysen region, Chile: towards an interpretation of development as a conversational phenomenon"), VII Congreso Internacional del CLAD, Portugal.
10. Vignolo, C., Potocnjak, C. y Ramírez Á. (2003): "El desarrollo como un proceso conversacional de construcción de capital social" ("Development as a conversational process of social capital building"), *Revista de Ingeniería de Sistemas* Volumen XVII, Número 1, July 2003.

Centro de Gestión (CEGES)
Departamento de Ingeniería Industrial
Universidad de Chile

Serie Gestión

Nota : Copias individuales pueden pedirse a ceges@dii.uchile.cl

Note : Working papers are available to be request with ceges@dii.uchile.cl

2001

29. Modelos de Negocios en Internet (Versión Preliminar)
Oscar Barros V.
30. Sociotecnología: Construcción de Capital Social para el Tercer Milenio
Carlos Vignolo F.
31. Capital Social, Cultura Organizativa y Transversalidad en la Gestión Pública
Koldo Echebarria Ariznabarreta
32. Reforma del Estado, Modernización de la Gestión Pública y Construcción de Capital Social: El Caso Chileno (1994-2000)
Álvaro V. Ramírez Alujas
33. Volver a los 17: Los Desafíos de la Gestión Política (Liderazgo, Capital Social y Creación de Valor Público: Conjeturas desde Chile)
Sergio Spoerer H.

2002

34. Componentes de Lógica del Negocio desarrollados a partir de Patrones de Procesos
Oscar Barros V.
35. Modelo de Diseño y Ejecución de Estrategias de Negocios
Enrique Jofré R.
36. The Derivatives Markets in Latin America with an emphasis on Chile
Viviana Fernández
37. How sensitive is volatility to exchange rate regimes?
Viviana Fernández
38. Gobierno Corporativo en Chile después de la Ley de Opas
Teodoro Wigodski S. y Franco Zúñiga G.
39. Desencadenando la Innovación en la Era de la Información y el Vértigo Nihilista
Carlos Vignolo
40. La Formación de Directivos como Expansión de la Conciencia de Sí
Carlos Vignolo

41. Segmenting shoppers according to their basket composition: implications for Cross-Category Management
Máximo Bosch y Andrés Musalem
42. Contra la Pobreza: Expresividad Social y Ética Pública
Sergio Spoerer
43. Negative Liquidity Premia and the Shape of the Term Structure of Interest Rates
Viviana Fernández

2003

44. Evaluación de Prácticas de Gestión en la Cadena de Valor de Empresas Chilenas
Oscar Barros, Samuel Varas y Richard Weber
45. Estado e Impacto de las TIC en Empresas Chilenas
Oscar Barros, Samuel Varas y Antonio Holgado
46. Estudio de los Efectos de la Introducción de un Producto de Marca Propia en una Cadena de Retail
Máximo Bosch, Ricardo Montoya y Rodrigo Inostroza
47. Extreme Value Theory and Value at Risk
Viviana Fernández
48. Evaluación Multicriterio: aplicaciones para la Formulación de Proyectos de Infraestructura Deportiva
Sara Arancibia, Eduardo Contreras, Sergio Mella, Pablo Torres y Ignacio Villablanca
49. Los Productos Derivados en Chile y su Mecánica
Luis Morales y Viviana Fernández
50. El Desarrollo como un Proceso Conversacional de Construcción de Capital Social: Marco Teórico, una Propuesta Sociotecnológica y un Caso de Aplicación en la Región de Aysén
Carlos Vignolo F., Christian Potocnjak C. y Alvaro Ramírez A..
51. Extreme value theory: Value at risk and returns dependence around the world
Viviana Fernández
52. Parallel Replacement under Multifactor Productivity
Máximo Bosch y Samuel Varas
53. Extremal Dependence in Exchange Rate Markets
Viviana Fernández
54. Incertidumbre y Mecanismo Regulatorio Óptimo en los Servicios Básicos Chilenos
Eduardo Contreras y Eduardo Saavedra

2004

55. The Credit Channel in an Emerging Economy
Viviana Fernández
56. Frameworks Derived from Business Process Patterns
Oscar Barros y Samuel Varas
57. The Capm and Value at Risk at Different Time Scales
Viviana Fernández

58. La Formación de Líderes Innovadores como Expansión de la Conciencia de Sí: El Caso del Diplomado en Habilidades Directivas en la Región del Bío-Bío – Chile
Carlos Vignolo, Sergio Spoerer, Claudia Arratia y Sebastián Depolo
59. Análisis Estratégico de la Industria Bancaria Chilena
Teodoro Wigodski S. y Carla Torres de la Maza
60. A Novel Approach to Joint Business and System Design
Oscar Barros
61. Los deberes del director de empresas y principales ejecutivos
Administración de crisis: navegando en medio de la tormenta
Teodoro Wigodski
62. No más VAN: el Value at Risk (VaR) del VAN, una nueva metodología para análisis de riesgo
Eduardo Contreras y José Miguel Cruz
63. Nuevas perspectivas en la formación de directivos: habilidades, tecnología y aprendizaje
Sergio Spoerer H. y Carlos Vignolo F.
64. Time-Scale Decomposition of Price Transmission in International Markets
Viviana Fernández
65. Business Process Patterns and Frameworks: Reusing Knowledge in Process Innovation
Oscar Barros
66. Análisis de Desempeño de las Categorías en un Supermercado Usando Data Envelopment Analysis
Máximo Bosch P., Marcel Goic F. y Pablo Bustos S.
67. Risk Management in the Chilean Financial Market The VaR Revolution
José Miguel Cruz

2005

68. Externalizando el Diseño del Servicio Turístico en los Clientes: Teoría y un Caso en Chile
Carlos Vignolo Friz, Esteban Zárate Rojas, Andrea Martínez Rivera, Sergio Celis Guzmán y Carlos Ramírez Correa
69. La Medición de Faltantes en Góndola
Máximo Bosch, Rafael Hilger y Ariel Schilkrut
70. Diseño de un Instrumento de Estimación de Impacto para Eventos Auspiciados por una Empresa Periodística
Máximo Bosch P., Marcel Goic F. y Macarena Jara D.
71. Programa de Formación en Ética para Gerentes y Directivos del Siglo XXI: Análisis de las Mejores Prácticas Educativas
Yuli Hincapie y Teodoro Wigodski
72. Adjustment of the WACC with Subsidized Debt in the Presence of Corporate Taxes: the N-Period Case
Ignacio Vélez-Pareja, Joseph Tham y Viviana Fernández
73. Aplicación de Algoritmos Genéticos para el Mejoramiento del Proceso de Programación del Rodaje en la Industria del Cine Independiente
Marcel Goic F. y Carlos Caballero V.

74. Seguro de Responsabilidad de Directores y Ejecutivos para el Buen Gobierno Corporativo
Teodoro Wigodski y Héctor H. Gaitán Peña
75. Creatividad e Intuición: Interpretación desde el Mundo Empresarial
Teodoro Wigodski
76. La Reforma del Estado en Chile 1990-2005. Balance y Propuestas de Futuro
Mario Waissbluth
77. La Tasa Social de Descuento en Chile
Fernando Cartes, Eduardo Contreras y José Miguel Cruz
78. Assessing an Active Induction and Teaming Up Program at the University of Chile
Patricio Poblete, Carlos Vignolo, Sergio Celis, William Young y Carlos Albornoz

2006

79. Marco Institucional y trabas al Financiamiento a la Exploración y Mediana Minería en Chile
Eduardo Contreras y Christian Moscoso
80. Modelo de Pronóstico de Ventas.
Viviana Fernández
81. La Ingeniería de Negocios y Enterprise Architecture
Óscar Barros V.
82. El Valor Estratégico de la innovación en los Procesos de Negocios
Óscar Barros V.
83. Strategic Management of Clusters: The Case of the Chilean Salmon Industry
Carlos Vignolo F., Gastón Held B., Juan Pablo Zanlungo M.