

Competence Building in International Networks: The Case Of The Telecommunications Industry

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Summary

The aim of this paper is to analyze how competencies are built and strategies are formulated in companies that are part of international interorganisational networks.

The theoretical framework merges concepts from Strategic Management, Resources Based View of the Firm and International Management literature. As special interest is dedicated to competence building in subsidiaries, the analytical framework considers three dimensions for their study: the internal driver (the MNE), the external driver (local features) and the subsidiary driver. The empirical evidence comes from an investigation carried out in the Telecommunications industry, where eight case studies were developed.

The field research outcomes indicate that external driver, the one that is directly related to the local markets, institutions and regulations, creates for subsidiaries' mutual interdependence and joint action. Thus, competence building in international networks assumes characteristics that can only be explained in relation to local competitive and operational conditions.

1. PRESENTATION

The aim of this paper is to analyse the determinants of the organisational competences building process in firms which are members of international interorganisational networks.

More specifically, the research question is: being a subsidiary part of an international interorganisational network, how does this influence the way in which competences are built? By adopting that research perspective we will be considering that the subsidiary is influenced by a triple determination: the first originated from the headquarters, the second from the demands of the local interorganisational network and the third from the local institutional and operational environment.

The empirical evidence presented in this paper comes from an investigation carried out in the Telecommunications industry. This is a particularly interesting field for investigation due to its "fast clockspeed", meaning "the rate of evolution of an industry, related to product clockspeed, process clockspeed and organization clockspeed" (Fine, 1998).

Studies about the Telecommunications industry are relatively recent in the business literature (Andersson and Molleryd, 1997). Although Specialized Equipment Suppliers, such as Ericsson, Siemens and AT&T among others, have often been used as case studies in the Innovation and Technology Management literature, major players in the field, like the network operators, were rarely considered relevant *loci* for research. That may be due, in part, to the fact that in most countries, Telecommunications used to be a public service,

and as such, those companies were evaluated mainly according to social, more than economic or efficiency-related, indicators.

That picture had a dramatic shift after the privatization process that took place in several countries. On the supply side, the now private-owned enterprises became responsible for the design and delivery of services in a competitive environment characterized by low entry barriers (Fransman, 2002), which has demanded from them the development of sound competitive strategies. At the same time, although fierce, competition is also strongly regulated by national and regional governments, due to their concern to guarantee the continuous quality improvement of the services provided to the general public.

On the other hand, in the demand side, privatization gave customers stronger position, both in the definition of services and in the evaluation of the performance of the suppliers. Under these conditions, the performance of network operators became intrinsically dependent on the appropriateness of the service offered in relation to the value customers wish or afford to pay.

Also, the privatization processes led to increasing internationalization of the industry. While specialized equipment suppliers were usually large transnational corporations adopting multidomestic manufacturing strategies, Telecoms network operators were strictly national or sub-national companies. After privatization, most of the important Telecoms companies became also transnational corporations. The role and importance of foreign enterprises in each local market was defined by the criteria chosen for the privatization process in each country. For instance, in Brazil (differently from what happened in many advanced countries), Federal and State governments opted for a complete withdrawal from their positions as the major controllers in the industry. As a result, the large local Telecoms enterprises became essentially European or North American controlled.

Therefore, the Telecom industry is a very attractive field of research because:

- it is a “naturally” global industry where competition is regulated at the local level;
- it has to devote a lot of attention to the characteristics of local markets;
- it comprises both service and manufacturing companies operating in close interaction;
- a specific relationship with local institutions;
- it is a fast clockspeed industry (Fine, 1998).

The first point that we develop in this paper is related to a brief analysis of the literature on International Manufacturing and Strategic Management of TNCs aiming to the establishment of an analytical model for tackling the research question. We then analyse the evolution of the Telecommunications industry in a global perspective and the evolution of the Telecommunications institutional context in Brazil. The field research was designed to provide information about the way in which competences are built and what would be the factors to justify that configuration.

2. THE MANAGEMENT OF INTERNATIONAL OPERATIONS

In a recent article, Vereecke and van Dierdonck (2002) conclude that “despite the importance attached to it by both academics and practitioners, the field of international operations management is still at a relatively early stage of theory development”. In our opinion, one of the difficulties for the development of theories is the topological approach that is chosen for the analytical framework: should a subsidiary be considered as a self contained unit, should it be framed as part of a network of subsidiaries or to the global value chains to which those subsidiaries are attached to?

Prior to the current movement towards the establishment of integrated global competitive strategies, subsidiaries operated in a relatively autonomous pattern and their organisational structures usually contained the same organisational functions that were found at the headquarters, even though their relative size and importance was different. When global competition increased, strategies and organisational structures were redefined in distinct ways: there were some subsidiaries that became essentially “operational arms” for their headquarters since they kept only “... manufacturing operations, leaving the more strategic, more value aggregating functions to the central countries. Notwithstanding, there were subsidiaries that were restructured under different approaches: some kept a relative autonomy regarding design activities and financial investments, besides manufacturing, while a third group had their role as centres of competencies in some product lines, as product developers and best practice disseminators, reinforced” (Fleury, 1999).

Strategic Management of Multinational Enterprises is seen as “a fast-growing body of literature on subsidiary strategy providing important insights which contribute to a more realistic understanding of the nature of the modern MNE” (Tavares, 2001). It draws on the the works of the International Business literature (Dunning, 1994) and the Management of Multinational Enterprises (Ghoshal and Bartlett, 1998, Birkinshaw and Hood, 2000).

Following the approach proposed by Tavares (2001, p. 143), we will consider that subsidiary evolution is a result of the dynamic interaction among three main drivers: Internal Environment (the MNE system comprising the parent company and sister subsidiaries), the External Environment (the local markets, institutions and regulations), and the Subsidiary Driver (the endogenous forces that underpin the subsidiary’s inner logic of proactive action and capabilities).

We built the analytical approach by focusing on the strategies of the Telecommunications enterprises, the role that their subsidiaries play and the way that international networks are shaped, by analysing their operations in Brazil.

3. THE CONCEPTUAL FRAMEWORK

We departed from the premise that the competitiveness of a firm is determined by the dynamic interplay between organizational competencies and competitive strategy. In the long run, the sustainability of the competitiveness of the firm will be associated to the management of the learning process that will reinvigorate and enhance organizational competencies and will fine-tune and reposition competitive strategies.

In building this approach, we drew its basic concepts from the Resources Based View of the Firm (RBV). We do not disagree that the industry analysis approach, based on the idea of “strategic positioning”, that has in Michael Porter its major protagonist, has been considered the most utilized in the definition of the main features of competitive strategies in general. This approach emphasizes the thorough understanding of the competitive position of the firm in the industry for the strategy formulation process (Porter, 1996:65). The main foci for the analyses are the markets and the competitors, and competitive advantages accrue from a clear exploitation of trends and opportunities. Notwithstanding, we agree with the critiques about the excessive “environmental determinism” of that approach and the proposition that the “organization and its environment are interpenetrating, making the boundaries that separate the firm and its markets diffuse.This is exemplified by strategic alliances and interorganisational networks, and create the grounds for the development of new approaches”. (Oliveira, 2001:123)

In recent years, a new approach that combines both the internal and the external analysis of the organization is emerging and it starts from the basic premise that the internal resources of the organization command the strategy. The Resources Based View of the Firm considers that every firm has a resource portfolio: physical (infrastructure), financial, intangible (brand name, public image), organizational (administrative systems, organizational culture) and human resources. For those who advocate this approach it is that portfolio that creates competitive advantages (Krogh and Roos, 1995). Therefore, the definition of competitive strategies should begin with a thorough understanding of the strategic possibilities supplied by those resources.

Tidd et al. (1998) classify the Porter's approach as rationalist and the second as incrementalist, the former being “heavily influenced by military experience” and inadequate in environments that are complex and fast changing. They recommend the adoption of the latter, “which should be seen as a form of corporate learning and experience on how to cope more efficiently with complexity and change”.

The argument that a strategic view of resources would lead to superior performance has a long tradition in the Economics and Organization literature. Penrose (1959) is considered the pioneer in the analyses that consider the firm as a set of resources and Wernerfelt (1984) and Rumelt (1984) are important contributors. For Wernerfelt, it is necessary to move from the analyses emphasizing external forces and products-markets, adopting a focus on the specific set of resources upon which the long term profitability of the firm depends. This would result in a “resource positioning strategy” in contrast with the Porter's

“industry position strategy”. Rumelt defended the idea that firms must be less concerned with creating barriers for market entry and more concerned with protecting their specific critical resources.

The Resources Based View of the Firm’s approach distinguishes between resources and competencies. “A resource is something that the organization owns or has access to even if that access is temporary. ... A competence is an ability to do something. ... A competence draws on a set of building ‘blocks’ called resources” (Mills et al., 2002: 9-14)

The term core competence emerged on the management scene in the classic paper “The core competence of the organization” by Prahalad and Hamel (1990). According to the authors, core competencies are built on intangible assets [resources] that cannot be easily imitated by competitors, are the source of the company’s ability to deliver unique value to its customers, and allow the company to be flexible in terms of markets and products. Core competencies are not necessarily related to technologies *strictu sensu*: they can be the outcome of excellence in any business function. Notwithstanding, to be a core competence in the long run, any company has to manage a systematic process of organizational learning and innovation, which basically relies on human resources development and education.

To make the approach operational, we developed an analytical framework relating competitive strategy, organisational learning and organisational competences. Following the classical approach (Woodward, 1965; Slack et al., 2001), we assumed that every firm has to perform three end-functions: Operations, Product Development and Sales and Marketing. Depending on the relative strength in each of those competences, the firm might follow the strategies can be categorised in one of three ways: Operational Excellence, Product Innovation or Customer Driven (Fleury and Fleury, 2003).

That approach considers that for each competitive strategy a different hierarchisation or prioritisation of those competencies is needed. The most important competence for a given strategy will be considered the core competence of the organisation, the other two becoming considered as supportive competencies.

That conceptual framework was applied for a better understanding of the issue of competence building in Telecom enterprises that established networks of subsidiaries that operate as part of international interorganisational networks, providing services and products to locally regulated markets.

4. The internal driver: the evolution of the Telecom enterprises worldwide

For Fransman (2002, p.4), “a key part of the “engine” driving change in the Telecoms industry is the technological regime that exists in this industry. The technological regime is defined by the conditions under which technological knowledge is created – which determine the rate of technical change and the kinds of technologies that are created – and the opportunities and the constraints that exist in the use of that knowledge. The technological regime, in turn, defines the learning regime that determines the kinds of

learning paths and patterns in which the firms and other organisations involved in the industry will engage” (p.7). Based on that concept, the author conceptualises the Old Telecoms Industry (to the mid 1980s) and the new Telecoms Industry.

In the Old Telecoms Industry, “the engine of innovation was located in the central research laboratories of monopoly telecom operators. After the central research laboratory did the initial research and developed and tested the initial prototypes, the task for further development was handed on to specialist equipment suppliers (SES hereafter)”. (ibid, 10). In that context, SES had essentially a national character operating in conditions which, up to a certain point, resembles the current role of Manufacturing Contractors.

In the end of the 1980s, “for different political-economic reasons, Japan, the UK and the US decided to end the monopolies of their monopoly network operators. The result was the birth of the original new entrants.... Although liberalising regulatory regimes provided a necessary condition for [the new entrants] rapid and successful entry, they were not sufficient. Equally important were low technological barriers created by the existence of specialist Telecoms equipment suppliers” (ibid, p. 14). Therefore, the SES were facing new times where manufacturing accordingly to the specifications defined by the network operators was not the only critical success factor: the supply of technology and turnkey projects became another important source of revenues.

“By the end of 1995 the new incumbent network operators [like British Telecom, France Telecom and Spanish Telefonica] made the decision to leave more and more of the R&D related to the network and its elements to the specialist technology suppliers”. (ibid, p. 16). That decision implied that a new pattern of technological development, in the strict sense of R&D activities, in the New Telecom Industry would be essentially in the hands of the Specialist Equipment Suppliers and would evolve according to their competitive strategies.

More recently, that pattern seems to be being redefined one more time. SES would be considering their strategy as “Integrated Solution Providers” (Davies et al., 2001), instead of product manufacturers. With the emergence of Manufacturing Contractors (Sturgeon, 1997), the more routinised Manufacturing and Operations activities and customer care services are now outsourced to newly created global companies such as Celestica, Solelectron and others.

The Figure 1 in the next page sketches out the evolution of the Telecommunications interorganisational networks. In the left hand column, the different types of enterprise that are part of the Telecommunications industry are presented, according to their relative position in the industry layers (Fransman, 2001). The drawing considers the four phases of that industry. In each phase, the left column is reserved for the representation of the structure of the industry in the advanced countries, the home countries of the Telecoms enterprises. In the right column, the structure of the industry in Brazil is presented. At the bottom line, we introduce the regulatory institutions, such as the ITU – International Telecommunications Union, that is increasingly influencing the configuration of the interorganisational networks.

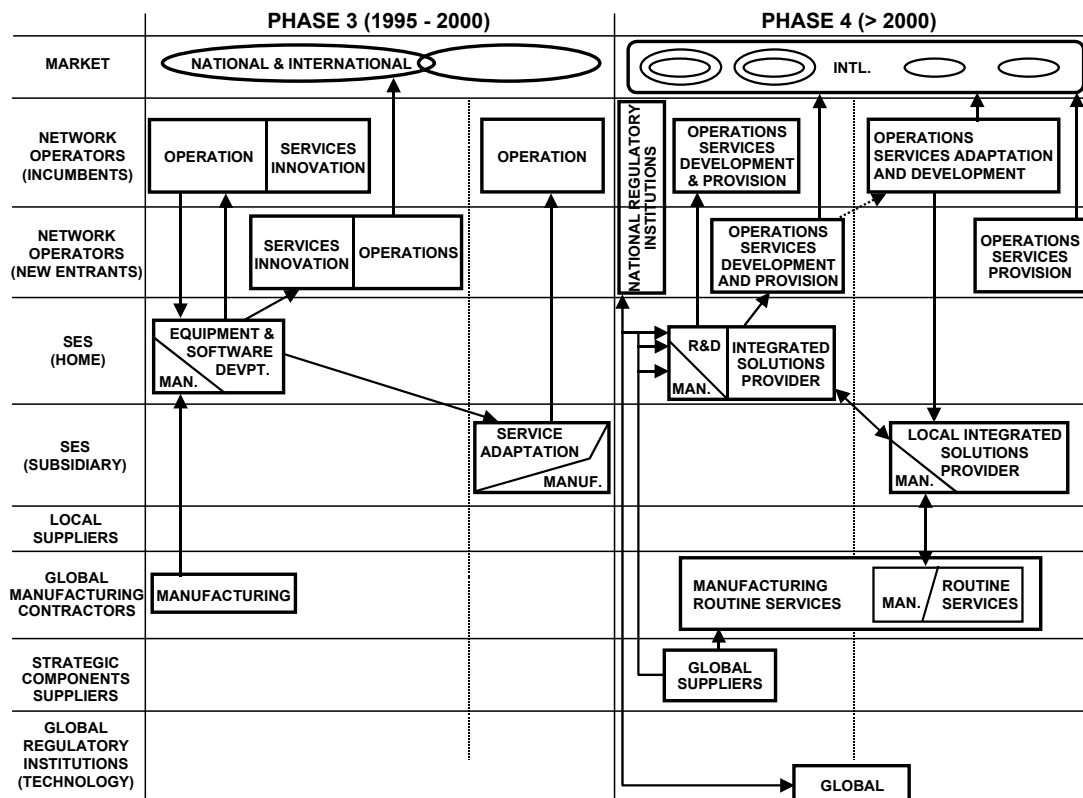
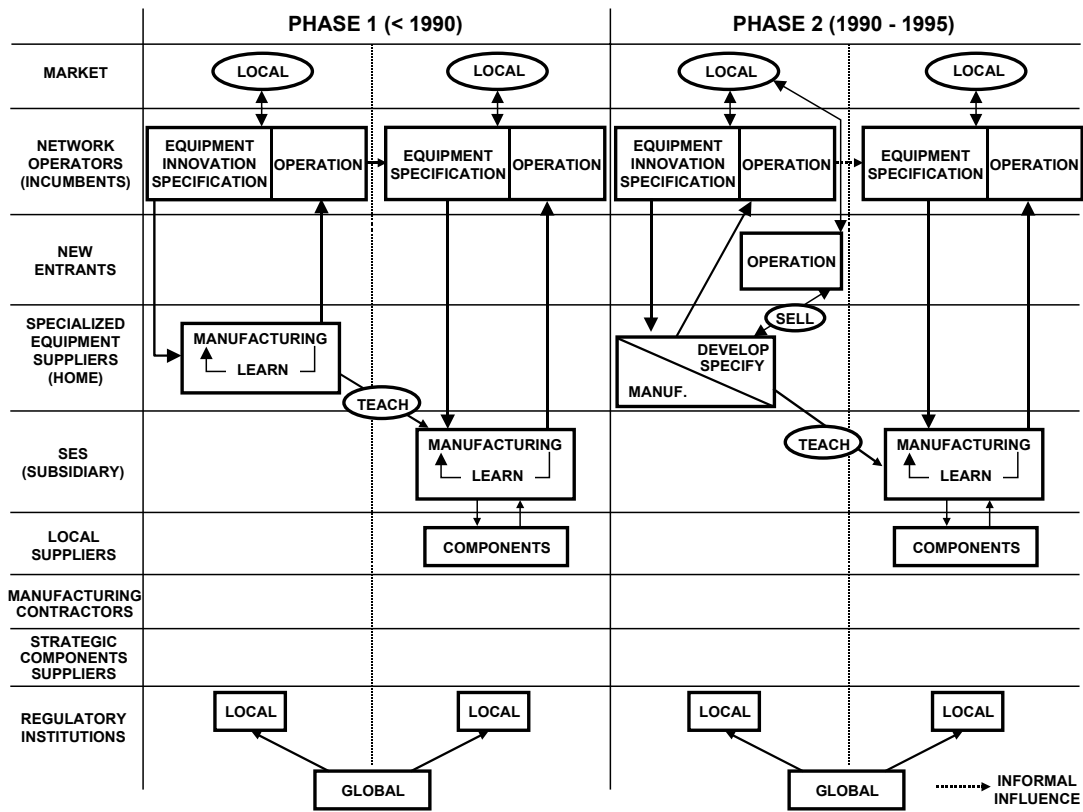
5. The external driver: the environment of Telecoms' subsidiaries in Brazil

In the late 1960s, a state-owned enterprise – Telebras - was created as the main responsible for the development and operations of Telecoms. It had an operational arm – Embratel – and a laboratory - the CPqD – Center for Research and Development which, to a certain extent, played the role that the above mentioned labs used to play. The scope of activities of specialist equipment suppliers was heavily influenced by the technological regime that was imposed by Telebras and the CPqD, through the establishment of specific operational standards, designs and technologies. The greatest achievement of the CPqD was the development of the Tropic switching system that became the local standard. Even the foreign subsidiaries: Ericsson, Thomson and NEC became producers of that system.

By the early 1990s, Brazil decided to develop a new model based on deregulation and privatisation. The enterprises who took charge of the network operations were the recently privatised Network Operators of European countries or the so called new entrants (as the case of MCI in the USA). Those firms were not technology driven, their competencies relying on the Operations and Sales & Marketing functions. This movement of the Network Operators was soon followed by new SESs such as Motorola, Lucent, Nortel, Bell Canada, who joined NEC, Ericsson and Alcatel (ex-Thomson).

A recent study by Rodrigues and Child (2001), utilising an approach derived from the co-evolutionary theory of organisations, analysed the evolution Telemig, of one of the most important Network Operators in Brazil, from 1973 to 2000. Even though their research was focused on a single enterprise, the outcomes reinforce the points that were above mentioned.

The field research to be described in the next section aimed at the characterisation of the competitive strategies and at the identification of the priorities in terms of competence building in those subsidiaries, as an indication of the pattern that the TNCs have been choosing in building their international networks.



6. Field research outcomes: the subsidiary drivers

6.1 Methodological considerations

As previously mentioned, three equipment-supplier enterprises were studied (one European, one Japanese and one American), three mobile communication network operators (two European and one Brazilian) and two large users (a bank and a newspaper producer, both Brazilian). The case of the Brazilian Network Operator, a regional company, was considered for comparative purposes only.

At these companies, we interviewed two or three persons from the directive board who were responsible for the enterprise strategy and planning as well as competencies management. The interview script focused on the following aspects: competitive strategy, critical functions, relationships upstream and downstream, service and product development, operations activities and management, human resources management. In every firm we searched for the characterisation of the competitive strategy, the role of the three basic functions (Operations, Product Development and Sales & Marketing) and the efforts and investments in organisational competence building.

In the analysis of products/services and markets we utilised the model developed by Silvestro (1999) which allows the positioning of each firm in the diagonal volume-variety. In that diagonal there are three basic types of services: Mass Services, Services Shop and Professional Services.

6.2 Network Operators

The Network Operators, as new incumbents, have undergone two phases since the privatisation process. Taking power of the previous state owned incumbent companies, they inherited the existing regional infrastructure, that was insufficient and not updated in terms of the latest technologies. Their initial strategy was oriented to fulfilling and anticipating the targets established by the local regulatory agency. This meant very heavy investments for the implementation of local infrastructure for the expansion of basic services and the introduction of new ones. In that period, operational efficiency was not at stake; the challenge was to build capacity as fast as possible in the regions they were responsible for.

Having met their targets at their original regions, those firms were allowed to compete for the national market. Interconnectivity became a key issue. An indicator of the fierce competition is the exponential increase of the pressures exerted over the regulatory institution.

For the establishment of competitive strategies, the firms that were studied are currently segmenting their markets according to three client/service types, their characteristics being similar to the types proposed by Silvestro (1999).

The first segment concerns the customers that demand voice transmission only: the goal is to increase operations scale and minimise costs to optimise the margin per client. Cost minimisation is achieved through the efficient utilisation of the resources, specially the infrastructure, in this case. The role of Marketing is fundamental in scale increase. Even if there are problems with quality levels and loss of clients (“churn rate”) the number of new subscribers is bigger than that of the ones who quit. Therefore, there is not too much concern with that.

The second segment includes the clients who, besides voice transmission, demand supplementary services such as answering machines and are interested in having low volume data transmission services, such as broad-band, WAP and SMS-Short Message Service. At present, about 20% of the enterprises income is derived from these services. The goal is to launch new services to raise clients loyalty and increase the utilisation of the infrastructure. As the local market is not yet well deciphered, the risk for new launchings to fail is not negligible. The role of Marketing is related to identifying clients profiles so that the choice for service and the investments associated to the launchings may be optimised.

The third segment comprises corporate services. For this type of client the aim is the development of solutions and systems that will increase its competitive strengths. As these, in general, become large and complex projects there is a strong dispute among consulting firms, Network Operators and SESs to become the prime contractors. This type of service requires a completely distinct set of competencies related to project management and the establishment of a relationship with the client that resembles a consulting firm.

Therefore, Network Operators are primarily concerned with better understanding of their distinct markets and operating as efficiently as possible in each one. They need to introduce innovative services for a certain market segment (the Service Shop segment) and they have to act as a kind of specialised consulting firm in the corporate market (the Professional Services part). Operations is the core competence for the basic services’ segment where the Operational Excellence strategy is followed. In the corporate market, the relationship with the client drives the other functions; the strategy is clearly Customer Driven. And in the Service Shop market a composition between Operational Excellence and Customer Driven is observed: Operations and Sales & Marketing must act in a very integrated way.

6.3 Specialist Equipment Suppliers

As previously mentioned, foreign subsidiaries of SESs in Brazil were essentially Manufacturing firms, following directions and designs issued by the local authorities. Nevertheless, those three firms are migrating towards a Customer Driven strategy. This is due to endogenous factors (the new clients’s profiles, the new rules of competition), but also to exogenous factors (the adoption of global standards, the establishment of new roles for the subsidiaries vis-a-vis the global strategies of their parent companies). Local activities prioritise servicing the clients, both the Network Operators and the end user.

Strategic product innovation seems to be associated with business alliances with firms in complementary industries as is the case of the Ericsson-Sony agreement. The role of subsidiaries seems to be the development of systems and devices to improve the operations of their local clients. In the words of Davies et al. (2001) they are becoming Integrated Solution Providers. Thus, heavy investments in the development of software (e.g. billing systems) or for the optimisation of network utilisation are in the project portfolio of those companies. In the same way of thinking and acting, due to the recognisance that Manufacturing is not their core competence anymore, those firms are using the services of Manufacturing Contractors, thus outsourcing the bulk of their manufacturing activities.

Therefore, local specialist equipment suppliers are now supplying their local clients under a Customer Driven Strategy. Understanding the clients' businesses and developing solutions (systems, components, ...) is the key competitive factor. The Product Development and the Operations functions have a supportive role.

6.4 Organisational competences in the interorganisational network

The organisational competences identified in the subsidiaries are pictured in Figure 2. It is important to remind that the Subsidiary column reflects both the influences of the local environment as well as the relationship with the parent company. This last aspect is considered in its basic details in the right column.

	Subsidiary	Parent company
Network Operators	<ul style="list-style-type: none"> • Definition of competitive strategy according to local market features (segments, sizes, competitors) while exploiting the determinations of regulatory institutions • Operating at maximum efficiency 	<ul style="list-style-type: none"> • Global strategies in terms of investments and partnerships • Development of new types of services
Specialised Equipment Suppliers	<ul style="list-style-type: none"> • Provision of integrated solutions for local clients • Proactivism, meaning close interaction with end users for the identification of potential services and products • Identification and assembly of the best suited technologies to customise global platforms • Supply chain management 	<ul style="list-style-type: none"> • Breakthrough type of R&D • Development of global platforms (specially hardware)
Manufacturing Contractors	<ul style="list-style-type: none"> • Creation and management of productive capacity to provide routine services for local clients 	<ul style="list-style-type: none"> • Purchasing at global scale • Development of manufacturing processes

Figure 2: Competences developed by Telecoms subsidiaries in Brazil

7. Final comments

The Telecommunications industry is a case where technological change is fast, market uncertainty is high and local regulation is relevant.

After privatisation, a gradual reconfiguration of the competences developed by each type of firm belonging to the interorganisational network took place. The field research outcomes reinforced the argument that in the last decade there has been a radical shift in the strategic relevance of the three functional areas, specially Manufacturing. The increasing competitiveness made Network Operators as well as Equipment Suppliers to move from strategies based on technology and manufacturing towards service based strategies. This structural change allowed the creation of new breed of firm, the specialised Manufacturing Contractors, that became organic parts of the interorganisational network. The concept of service emerged as the main determinant for competencies formation and strategy formulation at the distinct levels of the interorganisational network.

Coming back to the research question, after the analysis of the three determinations: the internal, the external and the subsidiary drivers, it becomes clear that the three of them exert strong influence in the pattern of competence formation in the Telecoms' subsidiaries.

It is particularly relevant to stress that the external driver, the one that is directly related to the local markets, institutions and regulations, affects the behaviour of subsidiaries not in an individual basis only, but influencing the joint performance of the whole network of subsidiaries, thus creating demand for mutual interdependence and joint action. In other words, the strategic behaviour of each firm in the interorganisational network is better understood when referred to the other subsidiaries participating in the network.

The main conclusion is that approaches which consider the formation and the dynamic relationships among firms and their subsidiaries in international interorganisational networks provide relevant insights for a better understanding of the evolutionary process of internationalisation of enterprises, thus providing directions and dimensions for model building.

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