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Innovation as means for the firm's success and survival is an issue that has already been taken for granted in the academic discourse. If one does a quick research on an academic data base, one will find that most research on innovation has focused on product and processes technological

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innovations. Within this argument firms succeed when they are able to develop their technological capabilities (Lall, 1992; Bell, Pavitt, 1995; Kim, 1999; Afuah, 2002). While these features may be desirable, some industrial firms do not stand in the technological frontier nor they concentrate their efforts on developing technological capabilities. Yet, they do have positive economic performance which allows their perpetuity over time as well as what Schumpeterian would call, extraordinary profits.

These observations show some theoretical questions that remain open. Is innovation only an attribute of firms that have a well developed technological capability? Why do some firms with low technological capabilities, grow and are profitable? In order to answer these questions it is necessary to have a clear understanding of the economic agent: the firm.

While the firm has been studied by different lenses (Marshall, 1898; Coase, 1937; Williamson, 1985; Penrose, 1959; Wernerfelt, 1984; Barney, 1991; Nelson, Winter, 1982; Dosi 1988), it's essence remains unchanged. That is, the firm is an economic agent that produces and transacts goods and services in order to meet the needs of another economic agent, the consumer. It is at the same time a repository of knowledge (Winter, 1991) that operates through certain capabilities and routines (Penrose, 1959; Richardson, 1972; Nelson, Winter, 1982) and an organizational arrangement that must operate efficiently aiming at reducing transaction costs (Coase, 1937; Willamson, 1985).

In this sense the firm is both an agent of technology and transaction. If one is looking for a more complete picture in order to go beyond the questions proposed by both Coase (1937) of "*why do firms exist?*" and Nelson (1991) "*why do firms differ?*", to obtain an understanding of "why some firms perpetuate?", one should combine both of these approaches mentioned previously. From these two perspectives we draw our capability-based model which is divided in a set of four complementary capabilities: development, operations, management and transaction capabilities. These four capabilities represent a *technological driver* and a *business driver*. In other words, all four capabilities explain the firm's efforts to develop and operate technological ventures, as well as its ability to coordinate an array of internal relations turning its outcomes into economic transactions to fulfill market gaps. Development, operations, management and transaction capabilities are present in all firms, however they vary according to industrial and sector specificities, as well as the firm's position in the supply chain and market approach.

Through this view, the firm's role transcends the simple allocation of production factors as the neo-classical economists would portray. After all,

the firm is an agent responsible for the allocation of knowledge. Innovation results from these complementary and integrated capabilities and the innovative firm can be justified through the predominance of one of the four capabilities. This helps explain why many firms in developing countries grow and perform well even though they are not primarily creators of technology. The purpose of the paper is to analyze what are the characteristics of the innovative firm in the Brazilian industrial context based on the four capability model.

This paper is organized as follows: section 1 addresses the firm and the innovation capabilities; section 2 explains the research procedure; next, we present the results; and finally, in section 3 we discuss our findings and future studies.

THE FIRM AND THE INNOVATION CAPABILITIES

Within neoclassical economics, the firm is seen as a "black-box" where resources are allocated in order to produce goods and services through price mechanisms regardless of how this process takes place inside the firm (Demsetz, 1997). Beyond this perspective, two main approaches to the firm have been developed. These perspectives can be divided into what we call the *coordination based approach* and the *capabilities based approach*.

The *coordination based approach* (Coase, 1937; Williamson, 1985; Penrose, 1959; Chandler, 1977) analyzes the firm as an agent of planning and co-ordination of production and transactions under the direction of a manager. In this view, the firm arises when the entrepreneur is a coordinator and decides to organize internally certain transactions that were once available only in the market. Penrose (1959) and later Chandler (1977), emphasize the role of managerial and administrative structures in the planning and coordination of internal resources in order to achieve efficiency and growth. The allocation of resources by the invisible hand of the market is replaced by the visible hand of management (Chandler, 1977). This approach is important because it underscores the role of managers in coordinating the resource allocation and reducing transaction costs. However, this view places little emphasis on market dynamics and firm's capabilities to constantly persue innovation.

Following a Schumpeterian tradition, the *capabilities approach* describe what the firm can do and how it seeks change and innovation in order to guarantee its continuity over time (Schumpeter, 1934; Richardson, 1972;

Nelson, Winter, 1982; Lall, 1992; Bell, Pavitt, 1995). In this view, the entrepreneur is an agent of change and the firm is a result of multiple sources of knowledge responsible for carrying out specific routines in order to deliver goods and services. This is achieved through the firm's capabilities; fundamentally those capabilities to develop new goods and produce them on a commercial matter. If the emphasis of the first approach is on efficiency through cost reductions achieved by the firm's internal organization and administrative structure, the second focus on the creation of value through knowledge (Madhok, 1996).

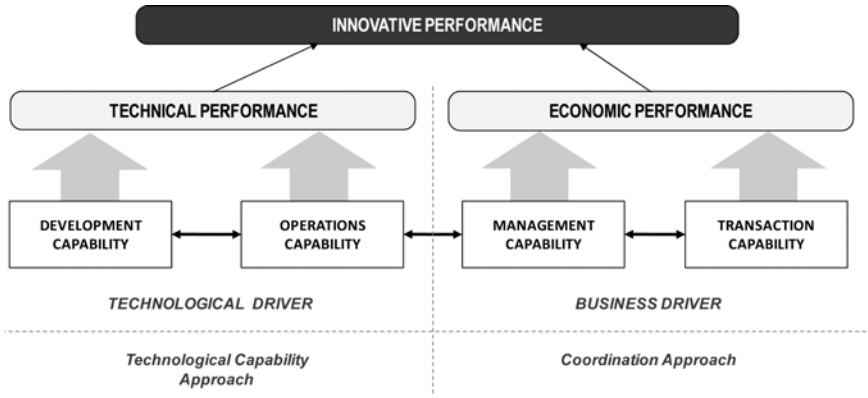
Every firm is the result of a technological synthesis which gives the foundations of its business relations. To produce and transact, the firm depends on two drivers: a *technological driver* and a *business driver*. The technological driver is the one that leads to the development of new products and their subsequent production. This driver is supported by development capability and the operations capability. Firms that have successfully developed these capabilities are technological leaders once their performance depends mainly on this technological vector.

In addition to technological driver, any firm requires a business driver. It is through this driver that the firm performs two important functions. First, it integrates the different areas of the firm, and second, it takes its goods and services all the way to the market to be transacted. The integration of different areas of the firms is realized through the management capability. Transaction capability deals with the activities related to the way the firm interacts with the market, be it customers or suppliers.

All of these four capabilities contribute to the firm's innovation performance (Zawislak *et al.*, 2012, 2013). These authors point out that the sources of innovation go beyond the development capability. That is, firms with weak development capabilities may have superior performance if they have advantage in one of the other capabilities (operations, management, or transactional). These findings help explain why firms from emerging countries, where technological innovation is less frequent, can succeed in the marketplace.

Within this approach, firms necessarily require a minimum of four capabilities, but superior performance depends on the predominance of one of them. The following four capabilities and their relation to the innovative performance of the firm are presented in Figure 1.

Figure 1 – Firm Capabilities for Innovative Performance



Development capability

Development capability (DC) involves imagining and building new value solutions to be transacted in the market. These new value solutions can be translated into new technologies or new products. DC is responsible for leading the process of technological development defined here as the broad process of conscious application of knowledge to solve concrete problems of a specific market.

The DC is initially drawn from the classical definition of technological capability (Lall, 1992; Bell, Pavitt, 1995), which is the ability to generate and manage technical change through the use of knowledge, skills and experiences. According to Lall (1992), technological capabilities are responsible for creating, adapting and developing new technologies that enable the firm to differentiate itself from its competitors. It is usually (but not always) substantially different from the skills needed to operate technical systems.

According to Afuah (2002), technological capability is the ability of the firm to use technological resources (patents, skilled engineers, stock of knowledge in the form of databases, specialized units, licenses, *etc.*), methods, processes and techniques to develop and sustain an innovative offering. It will mainly be defined and constrained by the skills, experience, and knowledge of the personnel in the R&D department (Nelson, 1991). It is pivotal for firm to gain advantage over their competitors over time (Rush *et al.*, 2007). Firms with advanced technological capabilities tend to be more innovative and thereby achieve higher levels of performance (McEvily *et al.*, 2004).

As noted by Bell and Pavitt (1995), there is a distinction between technological capabilities and production capability. They point out that while the former is made up of knowledge and skills to create and change the technology, the second is the set of knowledge and skills to use the technology. In order to make that distinction, we use DC, to refer to the skills to create change, while Operations Capabilities (next), as the skills to use technology.

Operations capability

Imagining and developing new products are key activities for firms to survive in the market. However, any firm should be able to turn the technological outcome into set of operations in order to produce in a commercial scale. This is achieved through the Operations Capabilities (OC). OC is the ability of the firm to produce products with quality, reliability and competitive cost. Studying the OC of the firm is essential to understand the different variables that guide the decisions on production technologies to be used, plant capacity and systems as well as production planning and control (Skinner, 1969; Hayes, Pisano, 1994; Wart *et al.*, 1998). According to Miller and Roth (1994), the operational capabilities typically include aspect such as quality, cost, efficiency, delivery, responsiveness and flexibility.

While the DC deals with constantly changing technologies, the operational capability leads mainly with routines, stability, efficiency and standardization, because those are features required to make products. Change in this capability mainly happens based on "learning by doing". That is, operations capability is inadequate to generate technical change, which is developed and managed by the technological capability (Bell, Pavitt, 1995). Paradoxically, OC influences DC once provides the technological base that sets the firm's path dependent trajectory.

Management capability

In addition to DC and OC any firm needs a set of skill that allows it to integrate all internal capabilities in a coherent way. Management capability (MC) was noticed and raised in importance, especially with the emergence of the large business enterprises in the early twentieth century. Through planning and coordinating, managerial work has been identified as a critical dimension driving efficiency and growth of firms (Taylor, 1911; Fayol, 1949; Penrose, 1959; Barnard, 1966; Mintzberg, 1973; Chandler, 1977; Lazonick, 1992). MC allows the firm to coordinate and integrate different areas in order to achieve economies of scale and scope necessary to compete in national and international markets (Chandler, 1977).

Salomon (2009) argues that the managerial capabilities are shaped by human capital, social and cognitive development with which managers build, integrate and reconfigure tangible (technical and operational) and intangible (technical and economics) resources. Trott (2008, p. 119) notes that "*the task of all managers is to improve their operation – otherwise they are supervisors and do not justify their job title*". By planning and coordinating, MC contributes the firm's efficiency by improving the use of resources and anticipating shortages (Lazonick, 1992).

It is noteworthy that, unlike the Operations Capability which is embedded in technical knowledge applied in routines, the management capability requires a wide range of abilities to be applied flexibly in problem-solving (Langlois, 2003).

Transaction capabilities

Finally, closing the set o capabilities needed to the functioning of the firm, there is the transaction capabilities (TC). TC are essential in the sense that any firm will need to transact its products in the market in order to simply survive. Thus, no matter how good a firm can be in all three prior capabilities, if the firm does not transact in the market it does not justifies itself as an economic agent.

Transactions capability is represented by a set of abilities, knowledge and routines that the firm develops aiming at reducing its marketing cost, trading, logistics and distribution, among others, that is, transaction costs (Zawislak *et al.*, 2013). Therefore, TC links the firm to its external environment, both through purchasing or selling. Moreover, this capability is also a key factor to analyze the market signals and alignment of the firm's offerings with the customer needs and expectations.

Firms without transactions capability are incapable of understanding the demands of consumers, nor can transact in the market at the lowest possible cost (Tello-Gamarra, Zawislak, 2013). Consequently, for most firms that are endowed with development capability to create new products and services, will also need the transactions capability to be economically feasible.

These aspects have previously been mentioned by Teece (1986) and, although important contributions have been made since then (Argyres, 1996; Madhok, 1996; Langlois, Foss, 1999; Argyres, Liebeskind 1999; Williamson, 1999; Mayer, Argyres, 2004; Leiblein, Miller, 2003; Jacobides, Winter, 2005; Mayer, Salomon, 2006; Argyres, Mayer, 2007; Argyres, 2011), further research is needed to achieve its definition and its subsequent consolidation.

Assessing the innovation capabilities of the firm

The previous discussion of the conceptual boundaries of each of the four capabilities and their complementarities is the basis for identifying different types of indicators (development, operations, management and transaction). The development capability (DC) follows the tradition of Lall (1992), Bell and Bell and Pavitt (1995) and Iammarino *et al.* (2002). For these authors, firms have three levels of DC: basic, intermediate and advanced. The basic level is the minimum that is required to a firm in order to operate in the market. The intermediate level features all the activities that the firm makes to improve the products and services it already does. The advanced level is an attribute that the firm needs in order to develop different products and services (this is an evolution from simply improving existing products and processes to creating uniqueness).

The indicators herein used for operations capability are a contribution from Skinner (1969) and Hayes, Wheelwright (1984), and the production types from Chandler (1990). In this paper, the indicators of OC are identified through three main production orientations: scale production, scope production and a mix of both. Scale production focuses on cost reduction as a result of the large amount of production; scale-intensive industries are generally innovative in processes in order to reduce their costs. Traditional industries such as food, beverages, textile products and footwear are included in this first group. Scope production refers to the benefits that the firm reaches from complementarity production (two or three products). The mixed production covers both types of production.

Table 1 – Innovation capabilities indicators

Capability	Indicators	Authors
Development Capability	Basic Intermediate Advanced	Lall (1992) Bell and Pavitt (1995) Iammarino, Padilla-Pérez and Von Tunzelmann (2008)
Operations Capability	Scope Mix Scale	Hayes and Pisano (1994) Wart *et al.* (1998), Chandler (1990)
Management Capability	Professional Family- professional Family	Penrose (1959); Barnard (1966), Mintzberg (1973), Chandler (1977), Zawislak *et al.* (2012, 2013)
Transactions Capability	Marketing Mix Supply chain	Coase (1937), Williamson (1985, 1999, 2002) Teece (1986), Argyres (1996, 2011), Madhok (1996) Langlios and Foss (1999), Cannon and Hamburg (2001), Kotabe (2002), Mayer and Salomon (2006), Zawislak *et al.* (2011, 2012)

With respect to indicators of management capability, the studies of Barnard (1966), Penrose (1959), Mitzberg (1973), Chandler (1977) and Zawislak (2013) have been analyzed. For the purpose of this paper, firms' management capability has been classified into one of the three levels based on the origin of the decision making: family (basic management, centralized decision), family-professional (management that advances to the professionalization) and professional (firms that are fully professionalized).

Transactional capability is directly related to the ability that the firm has to transact with their suppliers and customers. This concept is formed by the transaction costs theory (Coase, 1937; Williamson, 1985, 1999) but has progressed with the work of other authors (Teece, 1986; Argyres, 1996, 2011, Madhok, 1996; Kotabe, 2002; Mayer, Salomon, 2006; Zawislak *et al.*, 2012). The indicators related to this capability are marketing activity (the use marketing tools), supply chain (firms that are intermediary producers in a supply chain) and mix (the combination of both characteristics). Table 1 shows the indicators of the four capabilities that used throughout this study.

RESEARCH PROCEDURES

The aim of this research is to advance on the building blocks of innovation capabilities by examining evidence obtained from 44 companies interviewed. To enlighten the characteristics that each capability has to generate innovation, an exploratory study was conducted. Given our exploratory proposal, we found similar characteristics for each of the capabilities.

The companies' interviewed are located in the Brazilian state of Rio Grande do Sul (RS), which, in 2011, accounted for 6.65% of Brazilian GDP (FEE, 2012). First, we selected 100 companies which are representative industries of the state. Then, the framework was tested by interviewing managers and directors of 10 companies. Finally, we interviewed 44 more companies which are of representative industries, selected by specific regions of the state. The sample was constituted as follows in Table 2.

Data was collected in four stages. First, information was collected from secondary sources (firms' websites, articles, annual reports, *etc.*) before the visits. Secondly, in-depth interviews were carried out with people with extensive knowledge of their businesses, such as the owner himself, directors and/or managers. The interview questions where structured as shown in the Appendix of this paper. Thirdly, we visited the firms' facilities. While visiting each firm, we collected further information on issues that were not previously fully covered. Shortly after interviewing and visiting the firm's

premises, as part of the fourth stage, we wrote a report following the same structure used in the research instrument.

Table 2 – Number of companies based on OECD classification by industries

OECD Classification	Number of Companies
High-Technological Intensity (HTI)	*4*
Eletronics	2
Pharmaceuticals	2
Medium-High-Technological Intensity (MHTI)	*7*
Machinery and equipments	5
Motor vehicles	1
Chemicals	1
Medium-Low-Technological Intensity (MLTI)	*11*
Rubber and plastics products	4
Metal products	4
Refined petroleum products	1
Non-metallic mineral products	2
Low-Technological Intensity (LTI)	*22*
Food products, beverages and tobacco	8
Textile, textile products and footwear	9
Wood, pulp, paper	1
Furniture	2
Other manufacturing	2
Total	*44*

The analysis of the results was based on the capabilities framework and the empirical data previously sorted and filtered in the reports. To maintain confidentiality, the firms are referred to according to their specific industries. We used the OECD classification (2005) to arrange groups of companies according to their technological intensities. In each group all four capabilities are presented and described.

RESULTS

Companies' capabilities have been classified in one of the three options for each indicator in each capability. Table 3 shows this classification.

Technological Driver

To understand how firms work through their development and operations capabilities in order to achieve technical performance, and consequently, innovative performance, the processes firms carry out have been analyzed.

Development Capability

Development capability has been identified through the technological capability approach. Most companies of high technological intensity (HTI), following OECD classification (2005) do have an advanced technological capability. In that sense, these companies have a formal structure for research and development and continuously work on new product development. Considering that cooperative R&D between firms and universities in Brazil is not a very common practice comparing to what happens in developed countries, the HTI firms in this sample are the ones to engage in such activities. These companies also strongly invest in high-tech equipment aiming at achieving process efficiency. Nonetheless, even belonging to an industry of higher technological intensity, some companies present a basic development capability, where no formal R&D has been identified, and only basic improvements are applied in their products.

Companies in industries of medium-high technological intensity (MHTI) presented an unexpected performance in relation to their development capability. The majority of them have only basic DC. This could be a consequence of the context of an emerging economy. Companies of such classification generally make minor adaptations and amendments do products and projects, mainly as per clients' request or to keep up with market trends. However, there are examples of MHTI firms which have intermediate or high development capability. Accordingly, firms with intermediate DC have some structure for R&D but outsource it when it is of higher complexity. Firms with advanced DC have a full innovation program focused in new product development.

Although the majority of MLTI firms have basic development capability, there is a balanced classification between basic, intermediate and advanced technological capability. Firms with basic DC, as the firms from other technological intensity classifications, usually make only minor improvements in its products following clients' requests or market demand. Firms with intermediate DC may also have casual projects for products and processes improvements although they also usually make minor improvements. MLTI firms with advanced DC have formal R&D structure, where they continuously work on product e process development; as well as participate on government funding programs for innovation; and have targets for patent registration.

Table 3 – Companies capabilities' classification

	Technological Driver						Business Driver					
	Development Capability			Operations Capability			Management Capability			Transaction Capability		
Classification	**Advanced**	**Intermediate**	**Basic**	**Scope**	**Mix**	**Scale**	**Profes-sional**	**Family-professional**	**Family**	**Marketing**	**Mix**	**Suppply chain**
High-Technological Intensity	**3**		1	**1**	**1**	**2**	**3**	**1**			**2**	**2**
Electronics	1		1	1	1		2					2
Pharmaceuticals	2					2	1	1			2	
Medium-High-Technological Intensity	**1**	**1**	**5**	**4**		**3**		**2**	**2**	**2**	**1**	**4**
Machinery and equipments		1	4	3		2	3		2	1	1	3
Motor vehicles			1	1				2		1		
Chemicals	1					1	1					1
Medium-Low-Technological Intensity	**3**	**3**	**5**	**4**	**4**	**3**	**6**	**4**	**1**	**1**		**9**
Rubber and plastics products	1	1	2	1	1	2	1	2	1	1		3
Metal products	2	2		2	2		3	1				4
Refined petroleum products			1			1	1					1
Non-metallic mineral products			2	1	1		1	1			1	1
Low-Technological Intensity	**2**	**10**	**10**	**3**	**7**	**10**	**8**	**5**	**9**	**13**	**2**	**7**
Food products, beverages and tobacco	1	4	3			8	4	2	2	4	1	3
Textile, textile products and footwear	1	5	3	3	3	3	2	2	5	6	1	2
Wood, pulp, paper			1		1		1					1
Furniture		1	1		1	1		1	1	2		
Other manufacturing			2		2		1		1	1		1

Regarding the companies of low technological intensity (LTI) industries, as expected, presented a very low number of firm classified as advanced development capability. They have formal R&D structure and systematic related activities. The other companies are balanced between intermediate and basic DC. Firms of LTI with intermediate DC invest in equipment of better technology to improve their processes, discuss new projects, copy and adapt existing products, and aim at continuous improvement of their processes. The basic development capability firms may have laboratory structure; however, they are basically used to perform product quality control. The main changes on their products come from new materials presented by their suppliers, or from samples of competitor products brought by clients to be copied.

Firms of LTI sectors work in general with final products for retail. They are more focused on adapting their products than on creating new ones. Industries such as shoes and textile products follow fashion trends, which means research and development, are performed as part of their operation. Companies of MLTI sectors, on the other hand, to be able to deliver the products according to clients' requirements, need to have deeper technical and scientific knowledge than the LTI firms. This characteristic is a reflex of their position in the supply chain, where most companies work on a business to business base. Firms of higher technological intensity HTI and MHTI sectors must have an even higher technical and scientific knowledge in order to take and deliver their customized requests by their clients. In the companies of our sample, the relation user-producer is most evident in these industries.

Operations Capability

The other half of the technological driver or the technological capability approach encompasses the operations capability (OC). Firms have been classified by their operations capability in one of the three classifications: scale production, scope production, or the mix of both. Among HTI companies, there's been a balance between the three classifications, although the majority is oriented to scale production based on a certain type of product or one brand. When their production is scope oriented, firms produce manly based on client orders. When there's a mix of both orientations, companies produce by batches, but may also personalize its products according to clients' requests.

In firms of MHTI industries, there has not been found any case of mixed production. Companies either work on scale or on scope. When their production is scope oriented, companies produce once clients have put their orders. They produce customized products and do not work with supply inventory, but rather, produce on a just in time system. The firm working mainly on scale produces commodities or products that are sold on retail, and therefore, they may have inventory of finished products.

The production orientations are balanced again in the MLTI companies. As the companies of other classification, when they work on a scope approach, they produce only after a client's order, and do not stock finished products. They also produce customized items and work with just in time and kanban systems. MLTI companies working on scale have their own brand and sell their products on retail; therefore, they may stock finished products. Some also work on a continuous production system. Firms mixing scale and scope production orientations produce usually after a client's order, but may also keep some inventory for safety. And, although they produce standard products, they are flexible in adapting it when requested by clients.

As expected, companies of LTI industries are oriented, on their majority, to scale production. They usually produce the finished product and usually stand at the end of the supply chain make their products available for wholesale and retail. These products usually may not suffer any changes nor are customized. Just a few companies produce by scope, after a client puts his order. When the LTI firms produce their items on a mixed production orientation, they produce according to sales forecast, in that sense, they do not wait to produce only if they have a client order, neither make large finished products inventory. Despite having standard products, some firms may also have some level of customization based on clients' orders.

Considering all firms interviewed, it has been identified that the majority is classified as basic development capability and are scale-production oriented. Most companies of HTI industries have advanced development capability. Interestingly, firms of MTI intensity have opposite characteristics, as they present basic DC and produce, on their majority, by scope. MLTI and LTI firms have mostly basic DC. However, while the MLTI firms work on scope or mixed production, the LTI firms produce mainly by scale.

Business Driver

To understand how firms work through their management and transaction capabilities in order to achieve business performance, and as a result, innovative performance, the processes they carry out have been analyzed.

Management Capability

Management capability has been identified through the business decision-making approach. Most companies of HTI sectors in the sample do have a professional decision-making. Even though the owners of some family businesses participate in decision-making, the management of the company is usually professional. These companies have a formal governance

structure as well as a board of directors. In Brazil, these companies are part of multinational groups or are family businesses in the second or third generation. In these cases of family businesses, the founder participates of the board of directors. Nonetheless, even belonging to an industry of HTI, some companies in the electronic industry show an external dependency on its decision making process.

There is a balanced classification between familiar and professional decision-making in companies of MHTI. Some companies present a structured decision-making process based on the group of managers and directors, while other companies have centralized decisions on their owner. In our sample, most companies of MHTI are machinery and equipment companies. Many of these companies are small and medium enterprises (SME). Firm size may be an influence factor in the type of management. It seems that small business deals with less complex management problems. As the business grows, it has to a management a more complex structure and less centralized decision making process in order to solve more complex problems as well. According to this finding, it is possible to explain the existence of examples of MHTI companies which are in transition from familiar decision-making to professional decision-making.

Most companies of MLTI have a CEO who makes the decisions. Most respondents reported that the CEO of their companies makes decisions along with their managers through regular meetings. These decisions are supported by a body of managers or by an administrative council. Furthermore, there is a public corporation in our sample and one company that the CEO hired a consulting firm to carry out their strategic planning. Most of these companies manufacture for other companies (business to business) and not to the final consumer (business to consumer).

Unlike the companies of MLTI, firms of LTI belong to industries that produce for the consumer (B2C). Therefore, these sectors are characterized by the need to internally manage the distribution and sale of their products. In that sense, textiles and footwear are different from other industries within the LTI classification. Most of companies in textiles and footwear control the sale and have centralized decisions on their owner. Other industries like food and beverage have professional management; however the decision-making passes through the family council.

Transactions Capability

Firms have been classified by their transactions capability in one of the three classifications: marketing focused, supply chain focused, or a mix. In HTI sectors, firms are characterized by supplying other firms within a supply-chain.

Electronics companies are in the middle of supply chain and manufacture for other electronics companies. Pharmaceutical companies have a similar position in the supply chain and sell their products through distribution centers; however they invest in advertisement based on mass communication and sales promotion in drugstores (point of sale).

Although the majority of MHTI firms have focus on supply chain, there is one company in the middle of supply chain that promotes specific media campaign. This type of company supplies raw materials, parts or equipment for other companies or industries. The exception are companies that produce equipment for retail or automotive vehicles. This smaller number of companies has reported that its brands are their difference on market, so they are focused on marketing.

As expected, companies of MLTI industries have focus on supply chain. These firms supply raw materials and sell to other companies as builders, distributors, retailers and so on. In this type of business, the transaction capability is focused on negotiation with suppliers and clients. The performance takes place in these negotiations and are based on long-term relationship.

As expected again, companies of LTI industries are oriented to marketing. The difference is that tools are being used by companies to focus on marketing. Food, beverage and tobacco industries are focused on selling and distributing their products. In this case, sale and distribution may be owned or outsourced. To exemplify, furniture and various industries have their transactional capabilities focused on serving consumers through retail stores and local representatives. Furthermore, the textile and footwear industries promote the increase of its transactional capability seeking to strengthen their brand.

DISCUSSION

It has been observed that some companies classified as low or medium-low technological intensity behaved in terms innovation effort similarly to typical companies of higher technological intensity industries. Due to the method used, which is exploratory and not quantitative, no patterns were identified when firms were segmented by OECD classification. However, some interesting observations were possible. Companies of low technological intensity are the ones tending to follow a pattern, especially in relation to the operations and transaction capability. Their majority use scale production system and have a transaction capability based on marketing. That is mainly due to the fact that they produce mostly final products.

In that sense, we believe that identifying factors such as: the type of firm, its technological specificity, and the way it formalizes its innovative activity will allow us to identify what their innovative performance looks like. We also believe that one of the determinant factors for this performance is the relationship between supplier and client. That is, the more power the client has over the supplier, the less the supplier focus on product, market and management innovation, and the more it is aiming at an efficient process that satisfies their clients requests. That is also closely related to their position in the supply chain.

With this information we may group some features of the capabilities to characterize types of companies.

The Technological firm develops new technology, new products and new operational solutions through a strong R&D department. Therefore, products are differentiated and have their value perceived by the market as novelty. In that sense, the competitive advantage of the technological company is to generate enough knowledge barrier to new entrants. The temporary monopoly in the market highlights two important features: the limited relevance of the commercial department and management focus on innovation instead of on costs.

The Operational company acquires the necessary technology in the market and rarely develops it. The product development is under customer's requirements. Therefore, its organizational efforts are on the operations department. This type of company is mainly focused on searching for efficiency in manufacturing and internal management of resources. The commercial department is focused on buying rather than on selling.

The Managerial company is heavily based on organizational integration and coordination of resources rather than on a specific capability. In that sense, it is a professionally managed company. The complex management problems require complex management solutions. Furthermore, it seems that the large size of these companies influences the market and represents a barrier to new entrants. In this type of company, the product development will be more or less complex, depending on the companies' industry. The operations are based upon consolidated and technologically updated productive processes and on the constant pursuit of efficiency. The commercial department with integrates marketing practices, customer relationship and supply chain management.

The Transactional company is focused on customer value requirements, such as functionality, brand, style, and aggregated services. Therefore, this company develops products by monitoring market trends and usually searches for the consumer's immediate satisfaction. Consequently, innovations

come much more from the commercial department rather than from the technological area. One of the most important parts of its competitiveness lies on supply chain management and on delivery systems. The production can be done in-house or by a supplier.

In sum, typical Brazilian companies in Rio Grande do Sul are primarily focused on production and on the quality of their products. They develop solutions, in most cases, only when requested by clients, not proactively. Although these products may be new to the company, they are often not new to the market. We observed that companies adopt modern management techniques and tools, but these are not fully applied. Companies still rely on traditional family management predominantly based on a personal hierarchy, or are in the process of professionalizing it. Finally, most companies reported do not to have a well-developed transactional capability.

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APPENDIX

Research Instrument

1. Make a brief description of the company's important facts in its history.
2. Where does the company's knowledge come from?
3. How did the company develop the knowledge and the techniques to do what it does?
4. How is the company's knowledge level compared to its competitors?
5. Make a brief description of the company's commercial strategy.
6. Make a brief description of the relationship with suppliers and purchasing.
7. Make a brief description of the relationship with costumers and sales.
8. What makes costumers buy from you?
9. How is the price determined?
10. What is the company's commercial position compared to its competitors?
11. Make a brief description of the company's strategy.
12. Make a brief description of the company's administrative processes.
13. How are the company's costs compared to its competitors?
14. Make a brief description of the company's productive strategy.
15. Make a brief description of the company's productive process.
16. How is the productive efficiency level compared to the company's competitors?
17. Make a brief description of the development strategy and decision.
18. Make a brief description of the technology development process.
19. How is the company's development activities level compared to its competitors?
20. Give three examples of changes to the company.
21. Give three examples of innovation in the company, referring if they were new for the company, for the sector, for the country or for the world.

22. What kind of outcomes do the innovations generate for the company?

23. What is the company's differential advantage to keep competitive in the market?

24. What are the legal-institutional incentives or constraints for the company to innovate?

25. List in order of importance to innovation the following areas of the company: Technology, Operation, Management and Commercial. Justify.