

STRATEGIC MANAGEMENT OF TECHNOLOGY RESOURCES IN SMALL COMPANIES MANUFACTURING: CASE STUDY IN ARGENTINA

Mantulak, Mario José

Facultad de Ingeniería
Universidad Nacional de Misiones
Oberá, Misiones, Argentina
mmantulak@gmail.com

Hernández Pérez, Gilberto

Facultad de Ingeniería Industrial y Mecánica
Universidad Central “Marta Abreu” de Las Villas
Santa Clara, Villa Clara, Cuba
ghdez@uclv.edu.cu

Michalus, Juan Carlos

Facultad de Ingeniería
Universidad Nacional de Misiones
Oberá, Misiones, Argentina
michalus@fio.unam.edu.ar

Reception Date: 03/12/2016 - Approval Date: 03/28/2016

ABSTRACT

In an increasingly dynamic environment and sectoral contexts extremely complex, the need to propose alternatives to improve the use of technological resources in small manufacturing companies arises. The objectives of the study were focused on developing a model to strategically manage technology resources in small manufacturing companies, and, in the application of this instrument to a particular industry segment. To perform the job resorted to various methods of literature review and semi-structured questionnaires were used from interviews with entrepreneurs and survey of productive establishments. As a result a model that supports the mechanics required to take advantage of technological resources strategically exposed from the revitalization of the strategic thinking of entrepreneurs and an application is presented in the sector of small sawmills in the province of Misiones, Argentina. This paper has a strong impact as a contribution to strengthening the decision making at the management level and developing strategies of technological resources to improve the productive performance and the social responsibility of small manufacturing companies.

KEYWORDS: Technological resources; Strategic thinking; Small manufacturing companies.

INTRODUCTION

In Latin American context, restrictions on business competitiveness of small and medium enterprises (SMEs) they are characterized by significant technological lag (more pronounced in

small businesses), while their concerns are more focused on the short term (such as financing, administrative procedures, daily production problems, etc.), and tend to solve technological problems locally through adaptation of parts, or building their own machines (Zevallos Vallejos, 2007). On average, SMEs in Latin America reach relative productivity levels well below those that register countries of the European Union, in particular small Latin American companies achieve only between 16-36% of the productivity of large enterprises, while in European countries this proportion is between 63-75% of large companies (OECD / ECLAC, 2012).

The above mentioned indicates the urgent need to implement business strategies that enable small manufacturing companies, particularly in Latin America, to carry out their activities with improved productivity indicators. To this end, and under the condition that owns valuable technology in the context of manufacturing production processes, it is clearly essential to strategically manage technology resources and their associated skills.

Moreover, small businesses are characterized by a substantially flat organizational structure, formed at the managerial level by the owner manager and employees at the operational level, and generally have poor planning on their productive activities. In this context, on many occasions the employer must decide and / or perform tasks that are specific to the operational level, limiting the exercise of those thinking skills that could contribute to strategically envision entrepreneurship.

Therefore, the objectives of this work are focused on the development of a model to strategically manage technological resources in small manufacturing companies, and their subsequent application to small sawmilling sector. To this end, it has to work with a literature review focused on technological, strategic thinking, skills and technological capabilities, technology strategy, and in the sector of small sawmills in the province of Misiones, Argentina; then semi-structured questionnaires were used to interview entrepreneurs and relieve establishments sawmilling, from whose results were to characterize the various components of the model in the field of small sawmills of Misiones.

The technological resources and strategic thinking

From a business perspective, the resources are, in general, all assets, tangible and intangible assets that are available to achieve the aims of the company (Ventura, 2008). Particularly related to technology resources are highly strategic for exploiting synergies between the different components and means used by companies to achieve a given productive performance.

Therefore, Morin (1985) notes that current technologies are transverse (affecting several activities, including different from each other), Combinatorial (in general, are not used in isolation, but through specific provisions linked together) and contagious (spread to other alternatives to improve utilization and yields). It is consistent with Porter (1985) in which, in practice, everything the company makes technology involves some sort, both primary and support activities.

Thus Morin (1992) amalgam notions of resources and technology, and proposes a definition of technological resources as a set of tangible and intangible means that the company has and / or which could have access to the design, manufacture, marketing their products and / or services, use of information and management of all functions that contribute to the concretion of their activities.

To Gent Franch and Andalaft Chacur (2007), increasing competition forces companies to have strategic thinking to provide them to anticipate and respond to competitive requirements. That is why it is necessary that the employer energize or strengthen certain skills that predispose you to think strategically. Porter (1991) states that it is a process of convergent analysis and good planning methodology contributes to strategic thinking. However, Mintzberg (1994) statement that strategic planning is linked to the analysis, and strategic thinking with the synthesis, and stresses that the latter uses intuition and creativity to generate an integrated enterprise perspective.

With an integrated view, with which Heracleous (1998) coincide- argues that the concepts of strategic thinking and strategic planning are interrelated through a general perspective, where both are necessary for strategic management, and each of them is necessary but not sufficient. This statement is very appropriate and applicable to the segment of small businesses, where the general perspective focuses in most cases in one person - the owner / manager - that should set the overall development strategy of the enterprise and at the same time decide on issues or operational aspects of becoming daily settlement.

Moreover, with respect to activation and / or strengthening of those capabilities required to energize the strategic, such as creativity, intuition, analysis, synthesis, leadership, integrating perspective, reflection, thought the discernment and resilience, highlighted by several authors (eg, Porter, 1991; Mintzberg, 1994; O'Shannassy, 1999; Ohmae, 2004; Román Muñoz, 2010; Henkel, 2011; Sharifi, 2012;. Tański et al, 2012 ; Tovstiga 2012), it is necessary that its invigoration be carried out systematically, continuously and in the context of a virtuous cycle that report tangible superseders results in the short term and allows the employer to discern from pragmatism, the benefits of thinking strategically your business.

Skills and technological capabilities

It is necessary to make a distinction between the concepts of competence and capability (usually considered synonymous), linked to the context of business organizations. In this sense Boisot (1999) argues that technologies, skills and abilities, each in its own way, are manifestations of knowledge assets of a company operating at different levels of the organization. In turn, authors like Teece et al. (1997), Boisot (1999), Peppard and Ward (2004) emphasize that competencies are the skills, routines, modes of behavior and organizational techniques involved in obtaining a specific goal, while capabilities enable coordinated implementation and integrated strategic way of skills, in order to achieve overall organizational objectives.

Moreover, Suarez Hernandez and Ibarra Miron (2002) point out that Selznick began to use the term distinctive competence in 1957, to describe those aspects that distinguish one organization against its competitors. From Prahalad and Hamel (1990) the concept of core competences spreads, such as those found in the collective learning of the organization, especially how to coordinate and systematize the various techniques and integrate multiple technology production lines.

Meanwhile, Dankbaar et al. (1993) express that in general, a technology competition in a business involves the mastery of certain specific technologies that are relevant to their needs, it has a cumulative and must be re-created and constantly improved to contribute sustainably to its competitive position. In particular, the so-called distinctive technological competencies are strategic in the various organizational levels, and contribute to improving both the management capacity and the production, which impacts positively on the productive performance and social responsibility of the enterprise.

In the same direction and approach as proposed by Calderon Hernandez (2006), Castellanos Dominguez (2007) and Jardón and Martos (2010), it is adopted as a definition of distinctive technological competence as follows:

"Integrated technological resources that managed creative, coordinated and systematic manner, together allow leverage internal strengths and external opportunities, in order to enhance management capabilities and production so as to strengthen the competitive position of small manufacturing companies "(Mantulak, MJ, 2014, p. 19).

With regard to technological capabilities, Bell and Pavitt (1993) define it as resources that can generate and manage technological change; while Cristancho Amaya (2011, p. 12) sees it as "the degree of technological complexity required to achieve a strategic goal of the organization and that is evidenced through technological skills acquired." However, a definition

of the most relevant term with the objectives of this work can be established as one able to take advantage of integrated and systematically certain distinctive technological skills that achieve a strategic goal for the small business, in order to improve their productive performance and social responsibility.

The technology strategy

In general, companies must formulate a strategy for its technological resources, in line with its corporate strategy (or competitive strategy, according to possess one or more businesses); This criterion is also coincident with that of other authors in different contexts and times (for example, Hidalgo Nuchera, 1999; Escorsa Castells and Pasola Valls, 2005). According to Porter (1985, p 193) technology strategy can be understood as "a business approach to the development and use of technology."

Moreover, authors such as Suarez Hernandez (2003) and Escorsa Castells and Valls Pasola (2005) highlight the need to develop a technology plan that translated into actions, orientations and priorities for technology strategy, and also maximizes the use of technological heritage of the company based on its strategic objectives. The technology plan largely represents the set of actions to be executed in a given time frame, to ensure the required capacity for change in the enterprise to maximize the enjoyment of its technological heritage.

DEVELOPMENT

Materials and methods

The original investigation of this contribution, based its analysis on the importance of proper management of the management of technological resources based on strengthening the strategic thinking of the business and consequently the synergy from this is obtained, in particular with technology management in small manufacturing establishments. We worked from two (2) sources of information; on the one hand, the literature review and on the other, with data analysis in small manufacturing companies of forest industry sector in Argentina.

The literature exploration was oriented towards concepts related to technology resources, strategic thinking, technological management, technology strategy, and the various associations between them. These references allowed to establish links and components required for strategic management of technological resources in small manufacturing companies in the aforementioned sector.

The experimental work was based on the realization of a data gathering activities linked to technology management within fifteen (15) small establishments sawmilling. For which it was taken as a reference to the province of Misiones, since in this geographical area is established the highest concentration of sawmills by province of Argentina. To do this, information from interviews with entrepreneurs and owners of small sawmills survey of these industries, of which derived a characterization of that productive segment in association with the proposed model was used.

Moreover, Castro Monge (2010) justifies the use of the case study as a tool of qualitative research, and states that numerous studies by different authors point out the importance of this type of methodology in the analysis of management and business administration. The case study to analyze organizational processes from multiple perspectives, promotes cooperative work between researchers and actors studied, and enables a deeper understanding of the reality being evaluated knowledge. However, this tool has limitations as it does not allow a statistical generalization of the phenomenon studied, drawbacks to draw conclusions on the type of cause and effect, in addition to the investigative process can be influenced by the observer subjectivities.

Strategic management of technological resources in small manufacturing companies

It is convenient to re-state that strategic management in enterprises is based generally on the use of tools to strengthen their internal capacities, to improve the competitive performance of the organization, to meet the requirements of the environment and to reflect on a future the medium and long term, the difference biased daily management and / or very short-term approach generally reactive in nature (Gimbert, 2010). However, there is a confusion that underlies part of the literature when addressing this subject, to extrapolate to small businesses managerial solutions and applications for large companies, so it is necessary to develop a conceptualization refers to the strategic management foundation in management, organizational structure and sectoral reality of small manufacturing companies.

Under the above, the strategic management focused on the technological resources of small manufacturing establishments can be viewed through an organized outline of the main components involved and linked within the enterprise, and allows also identify the link with future environment, from its evolution from the current condition (see Figure No. 1).

As was conceptualized earlier, the development of strategic thinking in the field of small manufacturing companies requires the presence of certain dinamizantes capabilities for its materialization, but not necessarily all must match temporarily, for more specific dependent may

also be present each particular establishment and the conditions of their environment can also contribute to its development. Thus, one can argue that strategic thinking substantially contributes to the strategic projection of technological resources, aligned with the overall development strategy of small entrepreneurship, all of which is only possible when identified, enhance and / or activate those distinctive technological skills enable the development or creation of certain technological capabilities, from which the strategic management of technology resources becomes feasible.

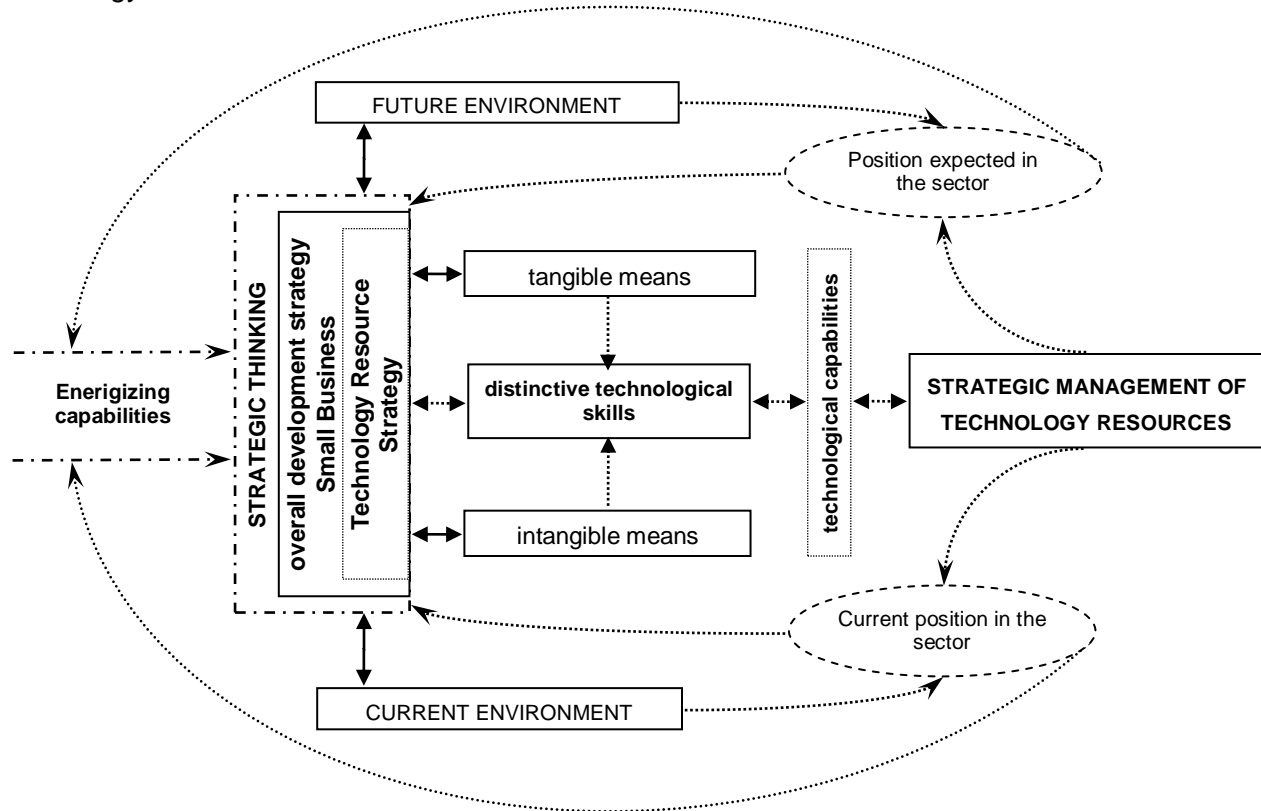


Figure No. 1: Components and generators links of strategic management of technology resources in small manufacturing companies

Source: Adapted from Mantulak (2014)

However, it should be clear that this is a process generated largely from the critical and reflective analysis of the entrepreneur, with full awareness of the situation in which they find their venture at present, as well as the strategic objectives feasible to achieve in the medium and long term. For the implementation of the above conceptualization it is necessary to devise and implement attitudes and behaviors that enable entrepreneurs energize the thinking skills required to understand the business from a strategic perspective from the everyday.

Manufacturing companies: segment of small sawmills in the province of Misiones, Argentina

In general, the management of technology is not considered a priority in small companies sawmilling sector in the province of Misiones, and carried out in a very simplified manner. In a previous investigation by Tański et al. (2011) in small sawmills in Misiones, problems associated with poor specialization are evident, the use of raw materials with characteristics of regular quality, the use of obsolete and scarce existence of specialized equipment (drying chambers, planers, moulders, technology etc.).

Moreover, other studies carried out in the business sector under analysis by Zorrilla (2004), Mantulak (2005), Knight et al. (2009) and Zdanovicz (2013) point out several problems in environmental management and occupational safety and devenida higienen industrial activity sawmills.

However, authors like Fernandez-Jardon et al. (2007), Tański et al. (2010); Michalus and Hernandez Perez (2012) and Tański et al. (2012) show a set of positive aspects within the business community of small businesses sawmilling Missions, such as advances in strategies aimed at business growth, the search for funding for access to new technologies, initiatives to improve production indicators, the increase in environmental management practices and activities related to the improvement of working conditions of workers.

Results

Model for strategic management of technology resources in small manufacturing companies

From the critical analysis of the discussed theoretical concepts a model for strategic management of technology resources in small manufacturing companies (see Figure No. 2), as those prevailing in the developing country, so was prepared to contribute to improve production performance and enhance social responsibility in this type of productive organizations.

In the proposed model the gap (gap) intended to at least reduce shown, symbolizing the possibility of implementing how entrepreneurs who manage small establishments can think strategically in terms of technology resources that enable them to seize and / or generate certain distinctive technological skills, to strengthen its technological capabilities and move toward strengthening management capabilities and production of their enterprises and must be contained essentially a strategy of technological resources, aligned with the overall development strategy, focusing the improving production performance and social responsibility that they can,

so that positive impacts are generated in the productive sector and progressively contribute to transform the present reality, and local and regional development.

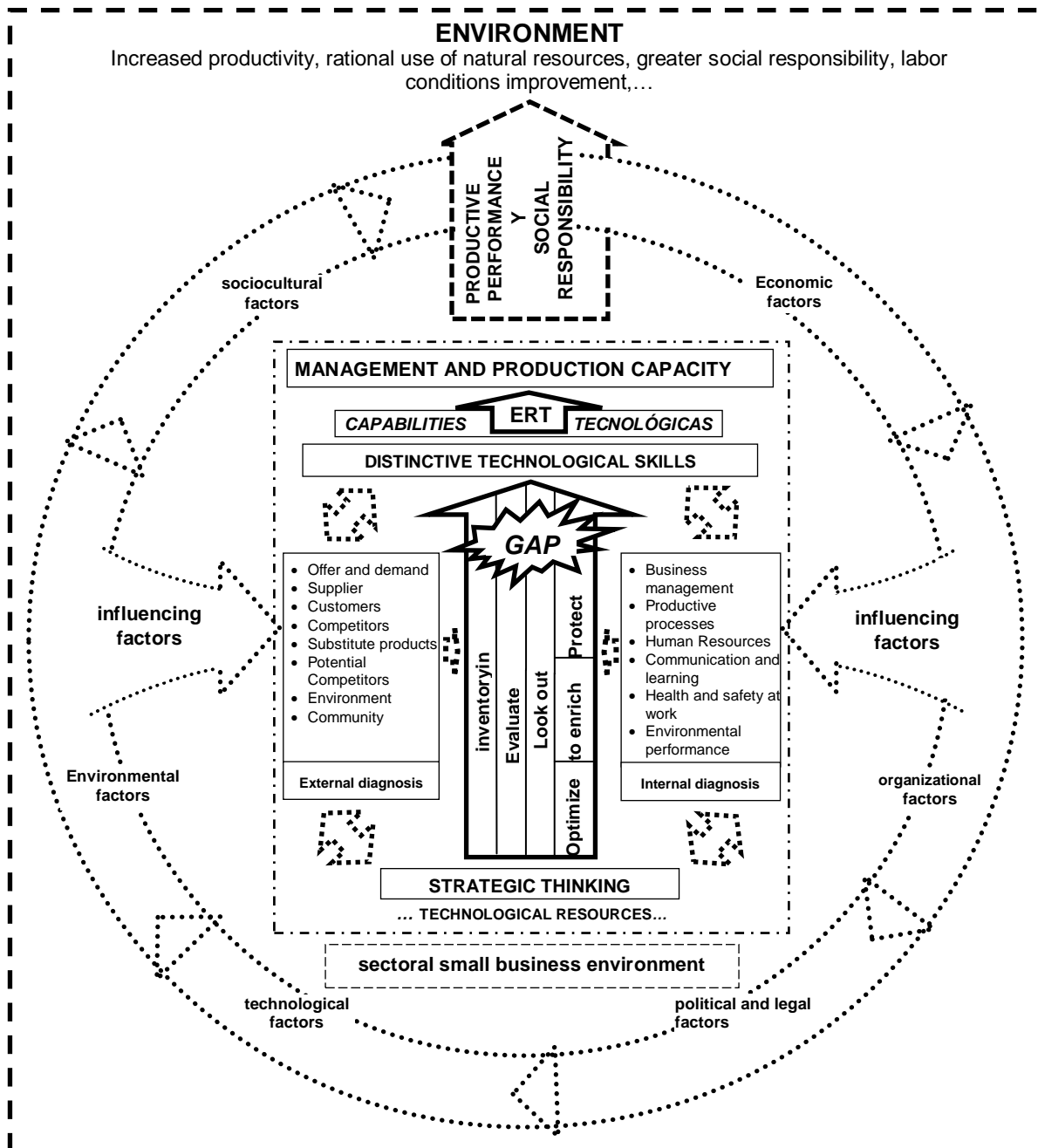


Figure No. 2: Model to strategically manage technology resources in small manufacturing companies - (ERT: Technology Resources Strategy)
Source: Mantulak (2014)

The model is conceived and constructed from the integrated approach the classical functions defined by Morin (1992), through which you can manage technology resources strategically in small manufacturing companies to improve their competitiveness and

consequently their impact on the social. To this end, strategic thinking is a necessary starting point in the relationship between the actual situation in a sector environment, usually weak and vulnerable, and a future scenario, but it could present more favorable for the sector in general it will not be so for those companies that must meet the challenge of new technological requirements in their products and processes.

Figure No 2 the relationship between the enterprise and its environment, in which the small enterprise puts its entrepreneurial potential and to meet external requirements and receive therefore the economic benefits of the market is also presented. That is why entrepreneurs need to think strategically and make decisions that will strengthen the performance of your small business, for which they need to make a specific and easily interpretable strategic analysis, based on an internal and external diagnosis oriented technology resources.

Management activities and production, human resources, conditions of hygiene and safety, as well as the practices associated with: thus in the process of internal diagnostics an analysis of the technological resources and various functional aspects, such as is done environmental management, and from the strategic technological resources and key success factors of entrepreneurship are determined.

It is clear that the internal diagnosis is not conceived as a process enclosed in itself, but feeds back both information supplied by the external diagnostic and issues arising from the influential environmental factors in their dynamics, so that in execution there is a sequential, but parallel and complementary logic for the external diagnosis.

The process of external diagnosis includes basically analyzing the sectoral context composed of customers, suppliers, current and potential competitors, substitute products (Porter, 1985) and different factors present in the environment performance of the company, from which they are determined casuistically the most influential.

These environmental factors are those that act on the dynamic company directly or indirectly, with influences that may be positive or negative for productive performance. Although there is a wide variety of factors, from what was proposed by various authors (eg. Pérez Moya, 1997; Campos Naranjo, 2007; Varela Villegas, 2008; Ventura, 2008; Michalus et al, 2009; Michalus, 2011) have been presented and generically grouped for analysis of: technological, economic, organizational, political and legal, socio-cultural and environmental, without ruling out other specific in specific cases:

- Technological factors: body of knowledge, expertise, machinery, equipment and current and future industrial processes (resulting from technological advances) that can influence the performance of small businesses.

- Economic factors: performance of the economy and the flow of goods and services, which exert their positive or negative influence on the sectoral and regional context.
- Organizational factors: functioning and interaction of the various organizations present in the territory (Michalus, 2011), the incidence may favor or limit production performance and social responsibility of small enterprises and their links with sector organizations.
- Political and legal factors: changes and / or changes in laws and regulations, as a result of political and legal movements within the market, industry and society as a whole affecting high degree managers and companies (Hill and Jones , 2011), and they can promote or conditional approval and/or application of laws and regulations aimed at support and development of small enterprises, generating local employment, safety and health of workers, and the preservation of the local environment and regional.
- Socio-cultural factors: social and usages, customs and values of the population of a region that may favor or limit, among other things, the creation of a corporate culture based on strategic thinking dynamic, rational use of resources natural, social responsibility of small businesses, social participation and supportive social development.
- Environmental factors: various components of the environment including life unfolds on our planet and which in turn are the cornerstone of all human activity (Conesa Fernández-Vitora, 1997); the influence of these factors is associated with the use of instruments of environmental management in the enterprise, the rational use of natural resources and overall protection of the environment.

Depending on the factors outlined above environment and under certain cyclical conditions, there will be factors that favor or influence the operation of the company, becoming casuistically influential factors on the establishment must be specified at the time of the internal and external diagnostics performed, as as it was pointed out. These factors can also impact directly or indirectly on management skills and production, through information flows generated in the core model, while they can also be affected positively or negatively by the actions derived from the resource strategy technology and its implementation in the small enterprise.

Indeed, in light of the increasingly complex technological advances, it becomes necessary to progressively develop skills based on knowledge, expertise, and routines in order to identify and strengthen the distinctive technological skills of small business, and in association with the raised by Porter (1985), represent the profit margin or spread to obtain in the value chain establishment allowing you to improve its competitive position in the market. In this sense technological capabilities are an amalgam that interconnects various distinctive technological

skills, empowering them by developing synergies that contribute to the management of technological resources strategic approach.

The necessary concatenation between technological resources, strategic thinking, the distinctive technological skills and technological capabilities as a result are derived, it is the fundamental basis for the development of the strategy of technological resources (ERT) small business base. Therefore, it requires a process that fosters and encourages strategic thinking of this kind of entrepreneurship from the flow of information from internal and external diagnostics that help strengthen the distinctive technological competencies, about to be generated strategy technological resources of small establishment. This process acts as a dynamo or drive model, located in the central part (core), and cyclically reactivates its application, as a promoter of continuous improvement necessary to proceed organizational management and small enterprise.

The principle that governs all activities, routines and actions within the so-called drive model must also be ordered with the process, so that helps to align the management of technological resources with strategic thinking entrepreneur, to exploit and / or generate those distinctive technological competencies that best contribute to the technological capabilities of the enterprise.

As a useful tool to specify the actions to close the gap noted above, the six functions Morin (1985), classified as active (ac) and support (ap), adapted appropriately to strategically manage technological resources were used small manufacturing companies:

- Inventory (ap) enables comprehensive diagnosis of the technological resources and the various internal factors that allow us to measure the technological heritage. This feature favors the construction of a (comprehensive) holistic view of the small establishment, by identifying their strengths and weaknesses.
- Monitor (ap) acts as a pillar of the process of external diagnostic allows the analysis of sectoral and general technological environment, with the aim of identifying, among others, several technological resources available in the market and those used by competitors as well to observe the set of external factors and their possible evolution. This feature also contributes to the development of strategic thinking entrepreneur and contributes to the analysis of technological positioning and socio-environmental influence entrepreneurship, by detecting opportunities and threats.
- Evaluate (ap) makes possible the assessment of technological resources and identifying the key factors within the company as well as the influencing factors of the environment, to enable the determination of the distinctive technological skills. This function nourishes the

strategic thinking through reflective analysis of the current position of the enterprise and what is intended in the future, to enable the formulation of the strategy of technological resources.

- Enrich (c): allows consolidate and improve technology assets (tangible and intangible) as a function of the distinctive technological skills. The function facilitates the revitalization of strategic thinking entrepreneur, it contributes to strengthening technological capabilities and enabling the deployment of the strategy of technological resources, through the application of technology plans for improving management skills and production venture.
- Optimize (c): enables effective and efficient use of technology resources. The function favors the improvement of production processes and health and safety conditions at work, as well as the possibility of mitigating impacts on the environment, all of which contribute to improved production performance and social responsibility of the enterprise.
- Protect (c) adequate safeguard viable technological resources and distinctive technological skills that enable small businesses to differentiate their products from those of competitors. The function enables the appreciation and retention of human resources through practical incentive for increased productivity and improved product quality.

The basis for the strategic management of technology resources in this type of enterprise is specified in a strategy of technological resources (ERT), obtained from a relevant strategic analysis based on its distinctive technological skills and technological capabilities, as well as a adequate knowledge of the productive and social environment in which the small settlement serves to ensure that this ERT contribute to enhance management capabilities and its own production, always in line with its overall development strategy.

The productive performance of these enterprises results in their ability to achieve a better position in the productive sector, with adequate and sustained management that allows you to not only survive in terms of efficiency in the short term, but also the possibility of consolidating progressive and sustainably in the market, based on their competitiveness. In addition, as a result of the increased complexity of socio-environmental problems and their increasing interaction with technology, compliance with the social responsibility of business has become a permanent management of technological resources challenge and its impact on the environment. This responsibility involves internal and external to the company, such social commitments such as adequate working conditions, provision of personal protection, efficient use of raw materials, proper waste management, rational use of natural resources, preventing polluting processes, among other issues.

Case study in the segment of small sawmills in Misiones, Argentina

In consideration of the theoretical results previously exposed as support of strategic management focused on the technological resources of small manufacturing establishments, it is necessary to articulate the academic theorizing with business reality and linking the concepts established with actions and activities common practice in small businesses . Therefore, experimental work (case study) was done in a specific productive manufacturing sector, which focused on the segment of small mills in the province of Misiones, by virtue of their proportional representation at the national level, in that geographic area that 30% of all sawmills in the country is concentrated, and is the largest concentration of sawmilling establishments by province of Argentina.

Given the nature of the case studies, these are highly suitable for analyzing issues related to the business world in its actual state, and allows understanding the nature and complexity of the processes taking place (Brito Vinas, 2000; Meyer, 2001; Suarez Hernandez, 2003; Cepeda Carrion, 2006). The case study (single or multiple) looking for a (non-statistical) analytical generalization using logical inference to other cases that have similar theoretical conditions (Castro Monge, 2010; Villarreal Larrinaga and Landeta Rodríguez, 2010).

Sawmills selected are representative of the whole segment under study, according to SIFIP (2009), since that comply with the following characteristics:

- a) Small business sawmilling, whose condition is markedly majority in the province of Misiones, Argentina (96% of timber properties are characterized as small businesses).
- b) Productions between 150 and 250 m³ / month of lumber (92% sawmill has a production of up to 300 m³ / month).
- c) Formal workers templates between 7 and 10 employees (80% of timber enterprises has up to 10 employees).
- d) Flattened organizational structures of type (owner / manager and employees).

Activities related to the management of technological resources in small enterprises sawmilling are strongly linked, on the one hand, the productive performance (utilization and forecasting technology, human resources, technological skills, provision of raw material, etc.), and on the other, with the sectoral context, local and regional realities, and the provincial and national tax pressure, which results in different alternatives and interests when managing these resources.

In order to link the theoretical with the practical, relevant associations between different components of the model and the most common features identified in the sector of small

sawmills they are established. This is important to link the academic theorizing with the pragmatism of productive activities.

In the segment studied there are limitations in the activities of business management, technological backwardness in facilities, low production levels, low-skilled labor work, generating environmental loads, poor job security. However, positive initiatives linked to the segment growth expectations, possibilities of acquiring new technologies, generation of alternative productive flexibility are also observed, among others.

- Technological resources

They were classified into tangible and intangible; between tangible are: the main carriage, different types of cutting machines, chipper, transport systems products, planer, moulder, team fungicide bath, conveyors wood waste, living sharpening tool room, and between the intangibles were identified: knowledge and individual and collective skills, individual organizational routines, mastery of certain specific technologies, adaptation of machinery and / or equipment to improve production efficiency, responsiveness to customer needs, through innovations, practices linked to environmental management and occupational safety.

- Strategic thinking

Among the key capabilities that contribute to the development or growth of strategic thinking they are: the entrepreneurial attitude, creativity, synthesis, management expertise, resilience, intuition, leadership, holistic perspective, insight, analysis and reflection.

- Internal diagnosis

The internal analysis of companies surveyed highlighted the following: quality control in certain finished products, planning activities for production, good environmental practices, technological capital structure increasing, dirt floors in most productive areas: internal analysis of the companies studied the following highlighted , problems of supply of raw materials, burning wood waste that cause problems with the surrounding population, breach of workers in the use of personal protection equipment, among the most important.

- External Diagnosis

The relationship of the enterprises visited with their environment is characterized by the following: association with other sawmills to meet demands of large customers, opportunities for products that have quality requirements, expanding domestic market, demands for new

products, product promotion at the national level, alternative staff training, through partnerships timber and / or college, medium-term financing for technology acquisition, demand for exclusive products, increased tax collection, as the highlight.

- Technological distinctive competencies

Based on the explicit knowledge, organizational routines and individual and collective expertise are surveyed, it is possible to identify the following skills: manufacture of differentiated products in quality, manufacturing of exclusive products, domain specific technologies, skills incremental process innovation, skills for product innovation, collective skills in production flexibility, basic practices of quality control, use of technologies for the use of wood waste, process-safe technological conditions.

- Technological capabilities

Considering the resources and technological skills detected is possible to characterize the technological capabilities in: production flexibility, incremental innovation of production technologies, acquisition and assimilation of new production technologies, adapting technologies to good environmental practices, adjustment and control technologies for safe work practices production.

- Strategies technological resources

In the sectoral context of small sawmills and its local and regional realities, basically three types of management strategies and technological innovation resources are identified: the traditional type, dependent type and defensive type. It is clear that the characterization of these strategies is the product of theoretical considerations made from the survey of the different ventures.

- Capacity and production management

Depending on the survey conducted indicators have been identified linked to the ability of management and production. Indicators of management capacity are: electric energy consumption (monthly), management (annual) technological resources, the (annual) unsafe working conditions, accidents (annual), linking with the (annual) environment. Meanwhile, among the indicators related to production capacity were defined: the total yield (monthly), the yield of cut (monthly), the yield of remanufacturing (monthly), the compliance rate as (weekly), reuse of raw materials (monthly), the percentage of wood waste (monthly).

Finally the characterization of the segment of small businesses in sawmilling in the province of Misiones (Argentina), from the components proposed in the model allows us to observe the complexity and diversity of the factual aspects in the development of activities of this type of enterprises, especially in the dynamic that identifies the studied sector, which tends to impact differently in each project, depending on the degree of planning and business management that has, for the development of technological resources available, conditions job security offered, as well as labor requirements by different primary sectors present in the local and regional economies. It is therefore essential to activate and/or strengthen the capacities that apply to the strategic thinking of the business, so that technological resources are used effectively and comprehensively, as well as their skills and associated capabilities so that to cope with the new demands of market and enable to improve the competitiveness of these small businesses.

CONCLUSION

For proper management of small manufacturing companies is essential activate those personal skills that contribute to the strengthening of strategic thinking in decision-making, in order to achieve a conduit to develop an integrated strategic vision that allows linking everyday decision making with the objectives medium- and long-term business.

The cornerstone of strategic management of technology resources in small enterprises manufacturing is supported by a strengthening of the strategic thinking of the employer allowing him to manage creatively and systematically, from an integrated tangible media and intangible approach available, in order to harness and/or generate the distinctive technological skills to contribute to the deployment of its technological capabilities.

The model developed allowed us to visualize and conceptually structure the necessary concatenation between technological resources, strategic thinking, skills and technological capabilities, as support to improve management capacity and production, and address comprehensively and systemically strategic management technology, in order to contribute to improving the production performance and social responsibility of the enterprise, from the deployment of Morin functions, resources and the consequent application of various tools casuistry that it may require.

The case study in the small business segment sawmilling in the province of Misiones, Argentina, possible a comprehensive and multidimensional characterization of these businesses from the analysis and implications of the strategic management of technology resources, and

enabled the visualization of the links between the distinctive technological competencies and consistent capabilities, and allows a finished identifying the various indicators related to the management capacity and production that are used in the sector and a strategic approach, can contribute to improve the productive performance and social responsibility in these endeavors.

Depending on possible limitations related to studies and for the purpose of extending the research are proposed as future lines of those oriented to the comparative study of different samples of the same business segment, cause-effect analysis of the generation of skills and technological capacities in small enterprises, and determining indicators for the strategic management of technology resources in small manufacturing establishments.

REFERENCES

Please refer to articles in Spanish References

BIBLIOGRAPHICAL ABSTRACT

Please refer to articles Spanish Bibliographical Abstract