| Revista *Clío América* | ISSN: 1909-941X | Vol. 12 | No. 23 | enero – junio de 2018 | 39 - 51 |
|---|---|---|---|---|---|
| DOI: 10.21676/23897848.2615 | | | | | |

# Recurrent practices to generate innovation based on non-r&d capabilities in the leather, footwear, and leather goods industry

## Prácticas recurrentes para la generación de innovación a partir de capacidades no I+D en el sector cuero, calzado y marroquinería

**Jonnathan López-Hurtado**
Associate instructor. Universidad Central, Bogotá, Colombia. Email: jlopezh1@ucentral.edu.co
**ORCID:**
https://orcid.org/0000-0001-7244-8478

**Francisca Rojas-Santoyo**
Assistant professor Universidad Central, Bogotá - Colombia. Email: frojass2@ucentral.edu.co
**ORCID:**
http://orcid.org/0000-0001-9963-684X

**Lucy Carolina Elizalde-Bobadilla**
Assistant instructor. Universidad Central, Bogotá, Colombia. Email: lelizaldeb@ucentral.edu.co, Lucy.elizalde@gmail.com
**ORCID:**
https://orcid.org/0000-0003-2121-123X

**Tipología:**
Scientific and technological research
**Fecha de recibido:**
February 9, 2018
**Fecha de aceptación:**
June 29, 2018
**Publicado en línea:**
July 19, 2018
**Para citar este artículo:**
López, H. J., Rojas, S. F. & Elizalde, B. C. (2018). Recurrent practices to generate innovation based on non-R&D capabilities in the leather, footwear, and leather goods industry. *Clío América, 12(24)*, p. 39-51
Doi: 10.21676/23897848.2615

**ABSTRACT:** The purpose of this work is to develop a theoretical and practical proposal for the analysis of innovation that, in organizations, can be generated by alternative or different routes to Research and Development (R&D). Based on an exploratory study with a qualitative approach, the theoretical bases on non-R&D innovation are proposed, in which activities, capacities, and mechanisms are considered to establish an interaction with the internal and external environment. Subsequently, in a fieldwork phase in the leather goods and footwear sector in Bogotá, Colombia, the application of theoretical assumptions in the organizational reality was validated, finding recognition of knowledge, technology, and design activities, as sources of innovation. In contrast, a low perception about associativity was found as an input for the generation or incorporation of innovation.

**Keywords:** innovation - non-R&D practices – capacity - associativity - technology and design.

**RESUMEN:** Este trabajo tiene por finalidad desarrollar una propuesta teórica y práctica para el análisis de la innovación que, en las organizaciones, puede ser generada por vías alternas o distintas a la Investigación y Desarrollo (I+D). A partir de un estudio exploratorio con enfoque cualitativo, se proponen las bases teóricas sobre la innovación no I+D, en las cuales se consideran actividades, capacidades y mecanismos para establecer una interacción con el entorno interno y externo. Posteriormente, en una fase de trabajo de campo en el sector de cuero, calzado y marroquinería de la ciudad de Bogotá, Colombia, se validó la aplicación de los supuestos teóricos en la realidad organizacional, encontrándose un reconocimiento de actividades de conocimiento, tecnología y diseño, como fuentes de innovación. En contraste, se encontró una baja percepción sobre la asociatividad como insumo para la generación o incorporación de innovación.

**Palabras clave:** innovación - prácticas no I+D – capacidad – asociatividad - tecnología y diseño.

**JEL:** M10, O32.

## INTRODUCTION

Part of the main arguments to consider innovation as one of the ways of how organizations manage to persist over time corresponds to their role in the creation of competitive advantages (Hobday, 2005; Martins & Fernandes, 2015; Cooperating and Economic Development (OECD) and Eurostat, 2015). Therefore, innovation is a need of the organization that is activated-or deactivated-in accordance with environmental conditions. Such a demand is not created, but the circumstances make organizations require it (need it) to innovate, much more when a market is atomized, with organizations that are engaged in developing products with similar characteristics, as is the case of the sector that occupies this Analysis: leather, footwear, and leather goods.

When dealing with the concept of innovation as a process, there are different currents or positions about how it generates in organizations, which, coining an expression of the economic sphere, would allow speaking from the orthodox and non-orthodox perspective. The first of these perspectives consider that innovation is generated through research and development (R&D) processes, which, in addition, present a series of well-defined stages that are followed under a linear logic, and that range from the research, properly speaking, until dissemination or commercialization, in the case of product innovations (Escorsa & Valls, 2003, European Commission, 2004, Godin, 2006, Katz, 2007, Rothwell, 1994, Trott (as cited in Velasco, Zamanillo & Gurutze, 2007). This way of operating the innovation processes implies, not only that essential investment is required in terms of tangible as well as intangible resources (Bernal & Frost, 2015, González & Hurtado, 2014), to sustain the structure underlying to R&D and besides, it would be excluding "medium and small companies that can operate with more informal processes" (Hobday, 2005 p.129).

It is precisely in this context that the non-orthodox current emerges: the innovation generated through alternative routes to research and development that are characterized by not following a specific process and not adapting to the characteristics defined by the Frascati Manual, to be considered as part of the R&D phenomenon. In this way, it is considered that, although one of the conceptual perspectives with which innovation is nourished not associated with research and development is the notion of resources and capabilities (in its infancy) -dynamic capacities (contemporary vision) -, there is still no clarity about how organizations can generate this type of innovation, especially from a practical point of view, because the theoretical advances are focused on analysis of developed countries, and there are few studies associated with developing economies (Guo, Zheng & Liu, 2017). That is, there is no integration of what could be considered necessary for the non-orthodox perspective to be valid in social formations with little investment capacity.

From the above, emerges a series of questions that are worth mentioning: what is meant by innovation, through an alternative path to research and development; onwards: innovation non-R&D? How to consolidate a theory on innovation, non-R&D, which does not intend to totalize the richness of the concept, but at least establish a basis for organizations to recognize and have a real alternative way of generating innovation, which does not imply perform research and development? What could non-R&D practices be considered sources of innovation in organizations? Is there currently a methodology that allows an analysis of non-R&D innovation in organizations? What kind of organizations could be more inclined to develop non-R&D innovation?

Based on the foregoing, and taking as reference the leather, footwear and leather goods sector of Bogotá, Colombia, in which it is considered that there is excellent organizational heterogeneity, the present work has the purpose of constructing a theoretical and instrumental proposal on the generation of innovation through alternative routes to R&D. This exercise is part of the research project called Analysis of recurrent practices for the generation of innovation from non-R & D capabilities in the leather, footwear, and leather goods sector in Bogota, approved by the fourth internal call of the Universidad Central.

## Towards an integrative theory to understand innovation non-R&D

From a review of the academic literature on what, in the introductory section, has been called non-R&D innovation in organizations, it is found that, as such, there is no unified or frequently used concept, unlike the innovation concept, for which it is common to resort, for example, to what is stated in the Oslo Manual (OECD & Eurostat, 2005). However, what is evident is the recognition that organizations can have innovation initiatives that do not necessarily depend on activities associated with R&D or investment in R&D (Arundel, Bordoy & Kanerva, 2008, Diukanova & López , 2014, Hervas, Sempere, Boronat & Rojas, 2015, Hervas, Albors & Gil-Pechuan, 2011, Hirsch, 2008, Moilanen, Østbye & Woll, 2014, Rammer, Czarnitzki & Spielkam, 2009, Santamaría, Nieto & Barge, 2009. Trujillo, Hervas-Oliver & Peris-Ortiz, 2015). By making an analysis of what has been said by these authors, several common elements can be identified, such as the geographical area of origin of the study (Europe), the methodology applied (analysis of innovation and business database surveys) and the content of the framework proposals on the elements conceived within the innovation non-R&D.

The framework in question contains a first approach regarding non-R&D activities. It is essential to establish the characteristics that make an activity consider, or not, within the scope of R&D. In this regard, the Frascati manual identifies five basic criteria: to be original, to be creative, to be uncertain, to be systematic and to be transferable and/or reproducible (OECD, 2015, p.28). On the first two criteria, it can be said that they are, by definition, immersed in the concept of innovation, while the remaining three depend on the innovation methodology followed. On the other hand, it has been identified that, as non-R&D activities, they are counted: the purchase of advanced machinery and the acquisition of computer equipment, specifically for the implementation of new or significantly improved processes or products, as well as the purchase of licenses, know-how, brands, and software. Internal or external training activities for personnel, which seek the development or generation of innovations; internal and external marketing innovations aimed at the introduction, in the market, of new or significantly improved products; market research, feasibility studies, design engineering and production (Arundel *et al.*, 2008, Diukanova & López, 2014, Hervas *et al.*, 2011, Hervas *et al.*, 2015, Rammer *et al.*, 2009, Santamaría *et al.*, 2009). When analyzing these activities in light of the previously exposed criteria, it is evident that they are not in the sphere of what is considered R&D, given that:

1. They are not uncertain since the knowledge acquired from outside the organization has already been proven, in other scenarios.
2. They are not necessarily activities that are carried out systematically. The organization may make an effort at the moment in time or do so irregularly.
3. They are not transferable or reproducible, given that (as shown below) they are based on the notion of resources and capabilities, which, by definition, have a low possibility of being imitated.

In addition to non-R&D activities, organizations must have capacities that allow such practices to generate a real and close impact to the innovations that are generated from R&D. Specifically, to typify the organizational capacities, the theoretical constructs about resources and capacities, absorption capacity and dynamic capacities will be used. These have been considered separately, to understand different organizational phenomena, as well as that of innovation, which is why they must be linked dynamically to address the issue of non-R & D innovation, as it constitutes another of the foundations and the theoretical perspectives of its approach.

In agreement with the previous thing, and when reviewing the theoretical evolution of the organizational capacities, it is observed how, in the first instance, the concept of resources and capacities has its origin in the decade of 1950; However, it is between the late eighties and the early nineties that this concept is assumed as a strategic alternative to the dominant approach of the time, which presented a significant concentration on elements external to the organization, such as the sector and its competition (Suárez & Ibarra, 2002). This new perspective had implicit recognition of the differences between organizations, and that would lead to different results when executing a strategy,

although this could be framed in what Porter called generic strategies.

So then, the strategy, under the concept of resources and capabilities, must be a product of the reconciliation between the elements of the organization and the environment in which it develops. However, this concept does not mention how to include elements from outside to existing capacities, nor how would the dynamics that can occur in a changing environment. In this way, the field is paid to generate two additional concepts: absorption capacity and dynamic capabilities.

The first one appears in the early nineties, and refers to the ability that organizations have, or should have, to take something from the environment. Under this perspective, absorption capacity focuses on what is outside the organization; therefore, it is important to be clear about the levels of the environment in which such capacity would operate, that is, it is necessary to decide how strategic is to absorb that something in the macro, mid- and/or microenvironment. Regarding the generation of innovation, absorption in the macro environment is associated with an advance in the domain of strategic activity, in which the organization devotes its efforts, but from a global perspective. If then, as a center, the organizational mission is placed, the mid-environment focuses on absorbing what is found, concerning country; and the micro-environment is much more specific when looking for ways to incorporate missionary advances from the industrial and sectoral. The internal environment should not be left aside; once it is decided to absorb, a process begins in the organization, so that what has been brought from the external environment is incorporated, which requires a series of institutional arrangements so that, ultimately, innovation can be generated.

Regarding the second concept, dynamic capacities, its appearance in the academic scene occurs at the end of the nineties. According to this approach, competitive advantage can be obtained by "integrating, building and reconfiguring internal and external competencies and quickly addressing environmental changes" (Teece, Pisano & Shuen, 1997, p.516), with which the concept of Dynamic capabilities broadens the scope of pre-existing paradigms, by making explicit the need, not only to include changes in the environment, but also to respond to such changes in a timely manner.

Under this perspective, and taking into account the position of Vivas (2005), it could be said that, for the organization, it is necessary to have static or dynamic order capabilities, particularly concerning knowledge, given that:

First, there are knowledge stocks (both collective and individual), which are resources that the firm owns and/or controls. Such resources are analyzed mainly from knowledge management. Second, there are dynamic learning processes (collective and individual) that develop from these knowledge stocks (p. 664).

Thus, a virtuous circle is created, in which an organization has initial capacities that allow it to operate in a particular context, these capacities are renewed once the new requirements of the context (internal and external) are identified, and they take actions to make necessary reconfigurations. From an instrumental perspective, resources should be analyzed based on their level of productivity, answering the question of how to use such resources efficiently, while capabilities correspond to the ability to make such resources, existing and potential, productive and efficient, for which a higher level is required for the management of tacit and implicit knowledge. This is how, in non-R&D innovation, the organization is understood as a non-repeatable collection of resources and capabilities, starting from the existing and projecting the potential. Under these premises, as part of the capabilities that would allow small and medium-sized organizations to generate innovation from an unusual perspective of innovation, are those shown in Table 1.

**Table 1.**
**Capacities that would make small and medium organizations prone to generate innovation**

| TYPE OF CAPACITY |
|---|
| Ability to analyze the external environment to identify and acquire relevant knowledge for the company and its operation. |
| Ability to interpret and conceive knowledge coming from abroad with the cognitive structures that are available. |
| Ability to adapt the knowledge acquired from the environment to the organizational realities, in such a way that it is possible to incorporate the routines and strategic processes, creating both new competencies and capabilities. |
| Ability to monitor the environment and identify changes at the macro (world), mid (country) and micro (industry - sector) levels. |
| Ability to recognize routines, processes, and aspects that do not generate value. |
| Capabilities for both the appropriation of technologies and for the design and construction of solutions, be it machinery, inputs, know-how or organizational type. |
| Human resource capability of the organization so that its internal and external actions are directed to the fulfillment of the mission. |
| Ability to recognize changes based on market demand or in science. |
| Capabilities to seek the generation of interdisciplinary work intending to solving a particular situation. |
| Ability to generate associative and cooperation strategies with clients, suppliers or other competitors. |
| Ability to recognize the competitive position of the market that entails taking on strategies to protect or advance in the market segment of which it is a part. |
| Ability to add value to existing products and services, based on current and potential resources and capabilities, intending to converting them into new products and services. |

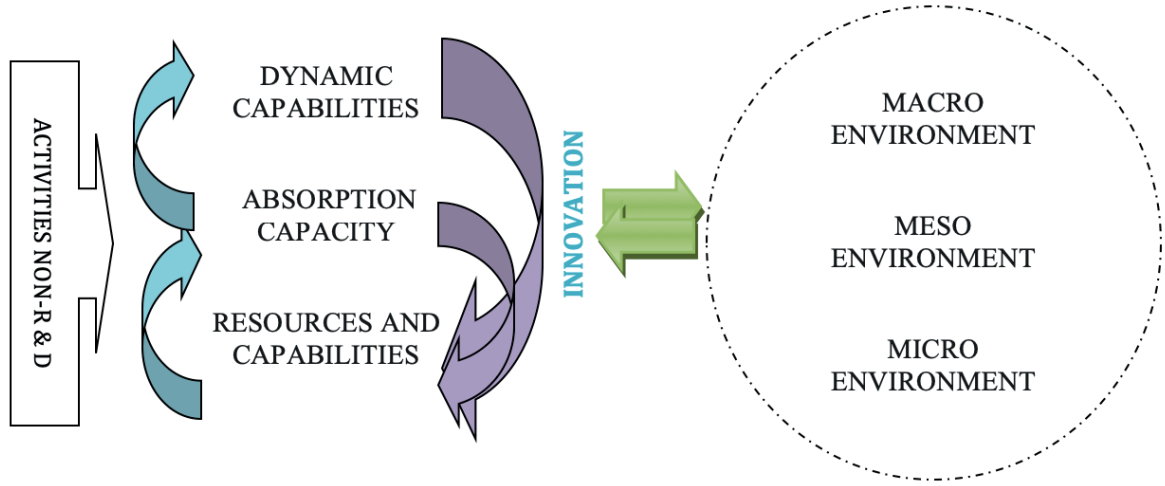
**Source:** Own elaboration

Of the capabilities mentioned above, in the first place, it is worth mentioning that they are not the only ones, which generates a space for an exercise in field work (empirical), to recognize additional or unknown capacities, until now, in the academic literature. Secondly, they do not imply processes associated exclusively with research and development, but they do provide a potential space for the generation and introduction of innovations whose base corresponds to existing and potential resources and capacities. For the latter type of capabilities, it is necessary to establish a relationship with the environment, given that it allows the detection and shaping of opportunities and threats (Teece *et al.*, 2007). As a complement to what is already explained in Table 1, the following summarizes the mechanisms by which the organization can interact with the environment: technology transfer offices, business incubators, science and technology parks, internships and professional practices, consultancies, programs of continuing education, cooperative and technology research centers, regional innovation organizations, strategic alliances or consortiums and business centers or units (Pineda, Morales & Ortiz, 2011, Morales, Sanabria & Caballero, 2015).

The proposed framework of analysis corresponds to the convergence of the theoretical perspectives

and other aspects that have already been exposed, and that, in the instrumental level, would allow the organizations to identify their current state against the recurrent practices for the generation of innovation through alternate routes to R&D. At the same time, allowing a strategic view to take action against how to generate innovation non-R&D. In this sense, Figure 1 represents the method for the analysis of non-R & D innovation in organizations, based on three theoretical perspectives: resources and capabilities, absorption capacity and dynamic capacities, which are complemented by mechanisms of interaction between the organization and the environment, which are reflected in the figure, by the green arrows.

**Figure 1.**
**Theoretical construct proposal for the innovation approach non-R&D.**




**Source:** Own elaboration

According to what was described as part of the proposal of the authors of this article, and responding to one of the questions presented in the introductory part, a definition of innovation non-R&D is proposed below: one that is generated from of the use of existing and potential resources and capacities. It takes into account the activities, practices, and routines directly associated with the mission of the organization, as well as those that support it; and its purpose is, through an alternative route to R&D, to contribute to the increase of productivity and the achievement of durability over time.

With the exposed elements, it can be concluded, in this section, that the non-R&D innovation is presented as an alternative, not only to recognize the existence of innovators who use these non-traditional mechanisms but also to propose policies that favor and support these initiatives. For this it is necessary to mention that the concept of unorthodox innovation can be interpreted from an evolutionary perspective; both, because one of the elements identified is the minor modification of products or processes (Qingqing, Yanting, Mingtianzi & Gang, 2016; Yanting, Xiao & Gang, 2016). Because, under the proposed scheme, there are base capacities to be able to develop others of a higher order, which, in turn, end up improving said base capacities, creating a virtuous circle that enables innovations, the product of a more profitable interaction with the micro, mid and macro environment, for example, acquire existing knowledge or establish relationships with customers, suppliers or other competitors.

## METHODOLOGY

This research is part of an exploratory study, taking into account that the phenomenon, object of study (innovation non-R&D), has not only been little studied but also, it is proposed an approach from a different theoretical perspective (resources and capacities, absorption capacity and dynamic capacities) (Hernández, Fernández, & Baptista, 2006). This typology, on the other hand, is within a qualitative approach, whose process according to Creswell (2009), "involves emerging questions and procedures and the data is normally collected in the participant's environment" (p. 4).

Based on the above, and taking into account the objective of the research, a literature review was first carried out, for which, in particular, academic databases were used for the theoretical development, and official documents of state and union organizations, as well as current news, regarding the approach and characterization of the sector.

For the development of fieldwork, a questionnaire was used that incorporated the theoretical elements studied. This questionnaire was applied to companies belonging to the sector, and which are located in the Restrepo neighborhood, recognized for its vocation towards the manufacture and marketing of products related to leather, footwear, and leather goods. In this regard, it should be noted that in this area there are about 1,500 companies that handle similar products in their portfolio (Forero, 2016). Despite this volume of companies, and because it is an exploratory study, a convenience sampling was established. Therefore, the instrument was applied to eleven companies.

## RESULTS

Returning to the proposal of the theoretical construct for the non-R&D innovation approach (figure 1), the first element found are the non-R&D activities, which, according to the theoretical revision, are classified into four categories: technology, knowledge, design and engineering and relationship (Arundel *et al.*, 2008; Diukanova & López, 2014; Hervas *et al.*, 2015; Hirsch, 2008; Moilanen *et al.*, 2014; Rammer et al., 2009; Santamaría *et al.*, 2009). According to this definition, in the fieldwork it was possible to demonstrate that 66 % of the entrepreneurs interviewed directly relate the design activity with innovation; 34 % do so with the variables of knowledge and technology; while none sees the issue of associativity as a source of innovation (figure 2). In the first case, it could be concluded that the importance of design, within innovation, lies in the fact that the sector is part of the fashion cluster; this conclusion is strengthened when other words are analyzed with which entrepreneurs relate innovation, such as fashion, trends, and tastes.

Another critical element to point out is that, for the interviewees, the correspondence between associativity and innovation is not evident, despite the fact that about 75 % of them belong to an institution and/or a union such as the Colombian Association of Footwear, Leather and its Manufactures (ACICAM for its acronym in Spanish) or the Chamber of Commerce of Bogotá (CCB). This could demonstrate the lack of promotion, by these institutions, to recognize them as a real source of innovation. Under this same perspective, when reviewing the terms with which associativity is identified, it is found that the most frequent are related to equipment, work or teamwork, with 50%; followed by terms such as alliances, agreements and commercial relationships, with 33 %; the remaining 17 % is dispersed in different categories.

Continuing with the analysis in the field of the proposed theoretical construct, we have the capacities that would allow the small and medium organizations to generate innovation. In this regard, it is important to note that the twelve capacities identified in Table 1 can be classified into four types: knowledge, technology, human talent, and relationship. Thus, for the first type, there are two variants: what sources of information are consulted to keep updated and what kind of news affect the established business. From the first variant, it is identified that the most used information sources are the internet, specialized magazines, fairs, the experience of other entrepreneurs, social networks,

suppliers, marketing studies and conferences, and exhibitions; together, these sources represent 60 %. About this same variable calls the attention an entrepreneur who, despite having more than 20 years of experience in the sector, argues that he does not consult any source of information.

**Figure 2.**
**Activities for innovation non-R&D**


**Source:** Own elaboration

Of the second variant, that is, news that affects the business, the most mentioned were those related to the sector, with 36 %; followed by economic ones, with 28 %; and policies, with 20 % (Table 2).

**Table 2.**
**Relevant news for entrepreneurs**

| TYPE OF NEWS | RELATED TO | NUMBER OF ANSWERS |
|---|---|---|
| Economic | Taxes | 5 |
| | Market Representative Rate | 2 |
| Sectoral | Competition for Chinese product and product | 5 |
| | Unfair competition and contraband | 4 |
| Technological | Machinery | 4 |
| Policies | Peace Process | 4 |
| | Foreign Affairs | 1 |
| **Total** | | 25 |

**Source:** Own elaboration

In this question, stands out how, on the news of a technological nature, it does not go very deep, only mention the machinery and its associated cost. This discovery is consistent with the agreement signed between ACICAM and the Servicio Nacional de Aprendizaje (SENA) during 2016, which has sought to "specify a joint work route that allows achieving excellent quality standards of Colombian products of the sector, converting them into world-class goods "(CCB, 2016). Within the framework of the agreement mentioned above, an investment of 13 billion COP was estimated, distributed in actions of knowledge transfer, restructuring of training programs and the acquisition and improvement of the machinery and technology used by the sector.

To validate the technological understanding, we continue with the capacities of this nature, which, besides, for practical purposes, have been divided into machinery, supplies, know-how, and management. Simultaneously, for machinery, two categories were established: the purchase of new equipment and tools; and training in new equipment and tools. The results (contrary to what was observed in the previous analysis) show a solid knowledge in the technological area, since 75 % of the interviewees have purchased new equipment, in the last two years, and 42 % have had team training and new tools.

In the case of supplies, almost 83 % of the interviewees claim that they have acquired innovative raw materials, within which the concept of fashion (textures, trends, prints, etc.) once again prevails. For its part, the category known as know-how presents an exact concentration on the participation of external knowledge transfer process (33 %), while the less recognized practice is the documentation of processes (8 %).

For the capacities associated with human talent, the years of experience and the levels of education of the employees of the firms interviewed were validated, finding that the average of experience in the different areas (design, production, administration, sales, and marketing) is of eight (8) years, which reflects a broad experience in the sector. This observation contrasts sharply with the levels of education, which are concentrated in the bachelor and university profiles, with 59 % and 18 %, respectively; while the training granted by the company, is practically nil. In contrast, there are training given by the Chamber of Commerce of Bogotá (CCB) and the National Apprenticeship Service (SENA). The latter (recognizes the employer) was basic training.

Finally, the capacities associated with relationships were investigated in three categories: networks; guilds and alliances; and customers and suppliers. For networks and guilds and alliances, four of the respondents identify themselves as affiliated to the CCB (average time of affiliation: 8 years), while two do so with ACICAM (average time affiliate: 15 years). When consulting for the perceived benefits, mention is made of: improvement of sales, representation, and training; while the issue of support for innovation is not very clear, which confirms one of the findings already presented. As for the clients, it is found that, of the 36 mentioned, 56 % are legal persons; 39 %, natural persons; and the remaining 6 % (two customers) fall into a generic category of final or virtual customers. Regarding the attributes associated with the preference of these clients, they are price, quality, design, the variety of portfolio and attention. On the other hand, suppliers of the surveyed companies (38 in total) are recognized, by 76 %, as legal persons (a concentration higher than that of the clients), and similar attributes are adduced for their choice: price, quality, design; and there are two additional variables that, for these entrepreneurs, are relevant: compliance and ease of payment.

To finish the analysis, in the light of the proposed theoretical construct, interaction mechanisms are addressed: Organization - Environment (among which are considered: technology transfer offices, business incubators, science and technology parks, internships and professional practices, consultancies, continuing education programs, cooperative and technology research centers, regional innovation organizations, strategic alliances or consortiums and business centers or units) (Pineda, Morales & Ortiz, 2011, Morales, Sanabria & Caballero, 2015). These mechanisms would allow having a concrete result concerning innovation. Under this perspective, and with the information gathered in this research, there is a high concentration in the mechanisms

associated with business fairs, centers or business units and consultancies, with 27 %, 21 %, and 12 %, respectively.

The above reflects that the source of innovation would be centered on the order of the micro-environment (sector) and the interaction at the mid (country) level would be left aside, a level for which it is necessary to know and take advantage of the policies that exist regarding productivity and innovation. This finding is coherent with the sources of knowledge acquisition (participation of 66 % in the sector's referents) and with relevant news for businessmen in political matters, which were focused on a current issue of the country (peace process), but not structurally, as, for example, the existence of incentives to improve competitiveness.

## DISCUSSION

The framework of analysis presented gives an account of the convergence of theoretical perspectives and other aspects that have already been exposed with sufficient rigor, and that, in the instrumental level, would allow the organization to identify its current state against the recurrent practices for the generation of innovation through alternative routes to R&D. The above also allows a strategic view to take actions leading to generate innovation non-R&D. In this sense, figure 1 represents the proposed method to perform the analysis of non-R&D innovation in organizations, based on three theoretical perspectives: resources and capabilities, absorption capacity and dynamic capacities, which are reinforced by the interaction of the organization with the environment.

On the proposed method, it is worthwhile to make two considerations. The first is that the resources and capacities lay the foundations to develop other types of capabilities that represent, not only the possibility of identifying relevant information of the environment and incorporate it into the organization (absorption capacity), but also increase the response options to new threats or opportunities that the internal and external environment offers (dynamic capabilities). These capabilities would allow materializing innovations, by interacting more beneficially with the micro, mid and macro environment, for example, making alliances with clients or suppliers that allow generating knowledge, as an input for such innovation. Second, insofar as the absorption capacity and dynamic capacities are developed, a new base of resources and capacities is created that prepares the organization to carry out innovation processes, without focusing exclusively on activities associated with R&D.

On the other hand, when carrying the theoretical construct proposed to the fieldwork phase, there are elements that coincident and others that, on the contrary, match in a significant way. Regarding the coincidence, it was found that, of the practices mentioned by the literature (knowledge, technology, human talent, and relationship), the entrepreneurs interviewed rely more on upon, to develop their innovations, in the first two. Specifically, practices associated with knowledge show that external information is obtained mainly from the micro-environment (sector), giving an account of the dynamics of organizations with technology levels: low-medium, which by nature tend to innovate. Non-R&D (Trujillo *et al*., 2015).

Another source of information on important knowledge is associated with the Internet, having the most significant individual participation, 15 %, a figure that confirms the vision of the World Economic Forum, according to which, in the digital revolution, new types of innovation that require little or no null investment in R & D (Schwab, 2016). Likewise, the practices associated with technology show an important application by the companies participating in the study, particularly with what has to do with technology adoption. This practice has been widely recognized by the literature, as a source of innovation alternate to R & D (Guo *et al*., 2017, Hervas *et al*., 2015, Qingqing *et al*., 2016).

Regarding the contrast, although the previous activities of the knowledge and technology categories are at similar levels in terms of their recognition as sources of innovation, this recognition is not consistent with, on the one hand, the low monitoring carried out on the news from technological order and, on the other hand, with little or no dedication, on the part of the companies, to carry out training to the personnel.

Concerning human talent practices, it is evident that these organizations support the routines of their employees, reinforced, primarily, by the years of experience in the companies (15 years on average). This finding coincides with the statement made by Lee and Walsh (2016) about "the importance of innovations that arise from the experience and problem solving of workers who do not work in R&D in their routine activities" (p. 357).

Finally, in the relationship practices, there is evidence of non-recognition of associations with unions or other institutions as a source of innovation, although 75 % of them belong to institutions such as ACICAM and CCB. This contrasts with what has been pointed out in different studies, in which it is considered that the establishment of relationships and alliances with other organizations and associations, based on the knowledge of the industry and the ability to create and maintain relationships with strategic partners, facilitates the creation of contacts and networks, fostering an environment of innovation (Eisenhardt & Schoonhoven, 1996, Westhead, Wright & Ucbasaran, 2001).

## CONCLUSION

With the obtained results, three lines are proposed that could be approached from public policies for the support of innovation, since these policies stimulate both the achievement of new factors of production, as the use in the already established.

The first of them: the promotion of the use of knowledge from environments less immediate to the organization, and that could be developed through a more active role of associations and guilds, and their recognition, by organizations, as support or source of the generation of innovation. This would allow, for the Colombian case, to accept or reject academic studies (mainly from North America) that consider associativity as an essential strategy for the incorporation of innovation, but that, in the present investigation, was found that it is not very present as a mean to generate innovation non-R & D.

The second line tends not to limit the use of technology to its simple adoption, but to strategies of appropriation and improvement of it, for example, incorporating the practices of generation of innovation non-R&D, progressively, to routines organizations, looking for such practices to transform processes that can be anchored in past times, which do not allow organizations to face up to current scenarios of great competition.

Finally, a third line that allows to manage the knowledge of employees, based on their experience, and as a complement to formal education; that can be, in some cases, of low level, in small and medium organizations, which have been considered as the organizations prone to the generation of innovation by alternatives to research and development.

Concerning future research, and seeking to continue the studies on innovation non-R&D, it would be important to investigate the mechanisms that would generate higher levels of efficiency between the articulation of productivity policies and the promotion of innovation of the organizations through non-R&D capabilities. This would allow shaping to a non-traditional theory of innovation, in which, not only are organizations taken into account as spaces in which innovation is directly incorporated but also, great value would be assigned to public policies, as catalysts of innovation promoted from the state level.

## BIBLIOGRAPHIC REFERENCES

Arundel, A., Bordoy, C. & Kanerva, M. (2008). Neglected innovators: How do innovative firms that do not perform RyD innovate? Results of an analysis of the Innobarometer 2007 survey No. 215. INNO-Metrics Thematic Paper. *PRO INNO EUROPE*. *INNO Metrics*. Recuperado de http://digitalarchive.maastrichtuniversity.nl/fedora/get/guid:413b75a4-8774-4fa2-80ee-51e8d357d117/ASSET1

Bernal, C. & Frost, S. (Abril, 2015). Innovación abierta en empresas colombianas: Reto a superar. *Revista Venezolana de Gerencia, 20*(70), 252-267.

Cámara de Comercio de Bogotá – CCB. (2016). *ACICAM y el Sena le apuestan al sector calzado y marroquinería*. Recuperado de https://www.ccb.org.co/Clusters/Cluster-de-Cuero-Calzado-y-Marroquineria/Noticias/2016/Febrero/Acicam-y-el-Sena-le-apuestan-al-sector-calzado-y-marroquineria

Crespi, G., Fernández-Arias, E. & Stein, E. (Eds.). (2014). *¿Cómo repensar el desarrollo productivo? Políticas e Instituciones sólidas para la transformación económica*. Washington, DC: Banco Interamericano de Desarrollo.

Creswell, J. (2009). *Research design: Qualitative, Quantitative, and Mixed Methods Approaches (3erd ed.)*. Nebraska, United States of America: SAGE Publications.

Diukanova, O. & López-Rodríguez, J. (2014). Regional Impacts of non-RyD Innovation Expenditures across the EU Regions: Simulation Results Using the Rhomolo CGE Model. *Investigaciones Regionales,* 29, 91-111.

Escorsa, C. P. & Valls P. J. (2003). *Tecnología e innovación en la empresa*. Barcelona, España: Edicions de la Universitat Politecnica de Catalunya, SL.

Eisenhardt, K. M. & Schoonhoven, C. B. (1996). Resource-based view of strategic alliance formation: Strategic and social effects in entrepreneurial firms. *Organization Science, 7*(2), 136-150.

European Commission. (2004). *Innovation management and knowledge-Driven economy*. Bruselas, Bélgica: ECSC-EC-EAEC.

Forero, L. (Productor) (27 de Junio de 2016). *Cuero, Calzado y Marroquinería, sector de talla mundial. Economía: Radio Santafé* [Audio en podcast]. Recuperado de http://www.radiosantafe.com/2016/06/27/cuero-calzado-y-marroquineria-sector-de-talla-mundial/

Godin, B. (Noviembre, 2006). The Linear Model of Innovation: The Historical Construction of an Analytical Framework. *Science, Technology y Human Values, 31*(6), 639 - 667. https://doi.org/10.1177%2F0162243906291865

González, C. & Hurtado, A. (Diciembre, 2014). Propuesta de un indicador de capacidad de absorción del conocimiento (ICAC-COL): evidencia empírica para el sector servicios en Colombia. *Revista Facultad de Ciencias Económicas: Investigación y Reflexión, 22*(2), 29-46.

Guo, Y., Zheng, G. & Liu, F. (Marzo, 2017). Non-RyD-based innovation activities and performance in Chinese SMEs: the role of absorptive capacity. *Asian Journal of Technology Innovation, 25*(1), 110-128. https://doi.org/10.1080/19761597.2017.1302548

Hernández, R., Fernández, C. & Baptista, P. (2006). Metodología de la investigación. Metodología de la investigación (4ª ed.). México DF, México: Mc Graw Hill.

Hervas, J., Albors, J. y Gil-Pechuan, I. (Septiembre, 2011). Making sense of innovation by R&D and non-R&D innovators in low technology contexts: A forgotten lesson for policymakers. *Technovation, 31*(9), 427-446. https://doi.org/10.1016/j.technovation.2011.06.006

Hervas, J, Sempere, F., Boronat, C. & Rojas, R. (Agosto, 2015). Technological innovation without R&D: unfolding the extra gains of management innovations on technological performance. *Technology Anlusis y Strategic Management, 27*(1), 19-38. https://doi.org/10.1080/09537325.2014.944147

Hirsch, K. (Enero, 2008). "Low-technology": A forgotten sector in innovation policy. *Journal of Technology Management and Innovation, 3*(3), 11-20. http://dx.doi.org/10.4067/S0718-27242008000100002

Hobday, M. (2005). Firm-level Innovation Models: Perspectives on Research in Developed and Developing Countries. *Technology Analysis & Strategic Management, 17(*2), 121–146. http://doi.org/10.1080/09537320500088666

Katz, B. (2007). *The integration of Project Management Process with a Methodology to Manage a Radical Innovation Project. Stellenbosch* (tesis de maestría). Universidad de Stellenbosch, Suráfrica Recuperada de http://hdl.handle.net/10019.1/2065

Lee, Y. & Walsh, J. (2016). Inventing while you work: Knowledge, non-R&D learning and innovation. *Research Policy, 45*(1), 345–359.

Martins, J. & Fernandes, M. (Abril, 2015). Too small to innovate? Creating value with fewer resources. *Journal of Business Strategy, 36(*2), 25-33. https://doi.org/10.1108/JBS-02-2014-0014

Moilanen, M., Østbye, S. & Woll, K. (Agosto, 2014). Non-R&D SMEs: external knowledge, absorptive capacity and product innovation. *Small Business Economics,* 43, 447-462. https://doi.org/10.1007/s11187-014-9545-9

Morales, M., Sanabria, P. & Caballero, D. (Junio, 2015) Características de la vinculación Universidad-Entorno en la Universidad Nacional de Colombia. *Revista Facultad de Ciencias Económicas: Investigación y Reflexión, 33*(1), 189-208.

Pineda, K., Morales, M. & Ortíz, M. (Enero, 2011). Modelos y Mecanismos de Interacción Universidad-Empresa-Estado: Retos para las Universidades Colombianas. *Equidad Desarrollo,* 15, 41-67. https://doi.org/10.19052/ed.193

The Organisation for Economic Co-operation and Development y Eurostat - OCDE. (2005). *Manual de*

*Oslo. Guía para la recogida e interpretación de datos sobre innovación (3ª ed.)*. Recuperado de https://books.google.com.co/books?id=CRixFkijlycC&printsec=frontcover&hl=es#v=onepage&q&f=false

The Organisation for Economic Co-operation and Development y Eurostat - OCDE. (2015). *Frascati Manual 2015. Guidelines for Collecting and Reporting Data on Research and Experimental Development, The Measurement of Scientific, Technlogical and Innovation Activities (6th ed.)*. París, Francia: OECD Publising. https://doi.org/10.1787/24132764

Qingqing, Z., Yanting, G., Mingtianzi, L. & Gang, Z. (2016). Non-R&D based Innovation and the Growth of SMEs in China: A case study of Hangzhou FC Company. En Kocaoglu, Dundar F. (Ed.), *2016 Proceedings of PICMET '16: Technology Management for Social Innovation* (pp. 1065–1073). Honolulu, Hawaii: Portland International Center for Management of Engineering and Technology, Portland State University.

Rammer, C., Czarnitzki, D. & Spielkam, A. (Junio, 2009). Innovation success of non-RyD-performers: substituting technology by management in SMEs [Edición especial]. *Small Business Economics, 33*(1), 35-58. https://doi.org/10.1007/s11187-009-9185-7

Rothwell, R. (1994). Towards the Fifth-generation Innovation Process. *International Marketing Review, 11*(1), 7-31. https://doi.org/10.1108/02651339410057491

Santamaría, L., Nieto, M. & Barge-Gil, A. (Enero, 2009). ¿Hay innovación más allá de la I+D? El papel de otras actividades innovadoras. *Universia Business Review,* 22, 102-117.

Schwab, K. (2016). *The Global Competitiveness Report 2016-2017, Insight Report*. Recuperado del http://www3.weforum.org/docs/GCR2016-2017/05FullReport/TheGlobalCompetitivenessReport2016-2017_FINAL.pdf

Suárez, J. & Ibarra, S. (2002). La teoría de recursos y las capacidades. Un enfoque actual en la estrategia empresarial. *Anales de estudios económicos y empresariales,* 15, 63-89.

Teece, D. J., Pisano, G. & Shuen, A. (Agosto, 1997). Dynamic Capabilities and Strategic Management. *Strategic Management Journal, 18*(7), 509-533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7%3C509::AID-SMJ882 %3E3.0.CO;2-Z

Trujillo-Ruiz, F. de B., Hervas-Oliver, J. L. & Peris-Ortiz, M. (2015). Entrepreneurship and Open Innovation in Spanish Manufacturing Firms. En M. Peris-Ortiz & J-M. Sahut (Eds.), *New Challenges in Entrepreneurship and Finance* (pp. 247–258). Springer Cham. https://doi.org/10.1007/978-3-319-08888-4

Velasco, B. E., Zamanillo, E. I. & Gurutze, I. M. (2007). Evolución de los modelos sobre el proceso de innovación: desde el modelo lineal hasta los sistemas de innovación. En C. Prado (Presidencia), *Decisiones basadas en el conocimiento y en el papel social de la empresa*. Ponencia llevada a cabo en el XX Congreso anual de la Asociación Española de Dirección y Economía de la Empresa (AEDEM), Palma de Mallorca, Ciudad en Mallorca, España.

Vivas, S. (2005). Competitive advantage and strategy formulation: The key role of dynamic capabilities. *Management Decision, 43(*5), 661-669. https://doi.org/10.1108/00251740510597699

Westhead, P., Wright, M. & Ucbasaran, D. (2001). The internationalization of new and small firms: a resource-based view. *Journal of Business Venturing, 16*(4), 333–358. https://doi.org/10.1016/S0883-9026(99)00063-4

Yanting, G., Xiao, C. & Gang, Z. (2016). How Do Non-R & D-based Innovations Affect SMEs' Performance ? The Mediating Role of Dynamic Capabilities. En Kocaoglu, Dundar F. (Ed.), *2016 Proceedings of PICMET '16: Technology Management for Social Innovation* (pp. 879–886). Honolulu, Hawaii: Portland International Center for Management of Engineering and Technology, Portland State University.