

Chapter 17

Model Management Plus for the Creation of Technology- Based Spin-Offs

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ABSTRACT

During the last years, universities have been developing the concept of creation of technology-based enterprises (TBE – spin off) as an answer to a global culture of development of science, technology, and innovation as mechanisms to structure new models of entrepreneurship in universities, being nurtured by technology and private-public alliances. With that in mind, the Plus Management Model for the Creation of Technology-Based Spin Offs Project was developed. It was aimed at developing a systemic methodology so universities, enterprises, and the government can articulate their efforts to develop spin offs of technology-based enterprises; thus, science, technology, and innovation become the core of competitiveness, the development of the society and organizations.

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INTRODUCTION

According to Spin Off Colombia RUTA N (2017), just 7 Spin Off projects have come out from 287 institutions of higher education, showing a low rate of creation of this type of enterprises. Some reasons for this situation may be related to the lack of knowledge about how to do it, lack of interest or lack of adequate resources.

The former highlights the importance of building a model that allows to establish an integration path between the academic sector and the industry to strength processes of research, innovation and development of technology-based enterprises spin offs. The proposed research methodology to develop this project is supported by the analysis and bibliographical research about a number of authors recognized by their professional and academic experience; then, variables that have an impact on the development of this type of project in universities were analyzed aimed at building a proposal of the model of management plus for the creation of technology-based enterprises Spin Off, which was finally validated by the judgement of experts.

In Colombia, functions of higher education are centered on processes of “Teaching-Research-Extension”. Besides, as mentioned by Etzkowitz and Leydesdorff (2000) in the last decades a third missional activity called transference and entrepreneurship has been added, allowing universities to improve national and international pertinence, appropriateness and academic productivity indexes. According to the OCyT (2017) (*Observatorio de Ciencia y Tecnología*), current investment in science, technology and innovation in Colombia is particularly low compared to international indicators (especially in R&D). The report states that investment in R&D in 2015 was 0,29% of the GDP, which was lower to the average of OECD countries (2.38%), even very low compared to the Latin American average of 0.70%. The same study of OCyT (2017) states that Colombia is below Brazil, Argentina, Costa Rica, Chile, Ecuador, Mexico and Uruguay; below successful nations from Eastern Asia like South Korea and China, whose investment is higher than 2% of the GDP. The document of the OCyT (2017) also points out that this lack of management of science, technology and innovation activities has affected negatively other areas of economic development in the country such as health, environment and agriculture.

According to the Document CONPES 2582 (*Departamento Nacional de Planeación*, 2009), there are shortcomings in the capabilities to develop science, technology and innovation projects; the same document states that SMEs compose over 90% of the Colombian productive sector, and they do not have the technical knowledge, neither the financial resources necessary to invest on research projects that allow them to create new technology-based enterprises spin offs; the document also mentions factors that have an impact on the innovation and development processes of new productive units such as lack of knowledge of innovation activities, technological upgrade and lack of knowledge of incentives to innovation. Such information is ratified by the following three indicators also presented in the document, which highlights the relevance of this research project and its impact on society (such indicators are shown in tables 1, 2 and 3). Table 1: Percentage of active researchers by institution type, shows the percentage of researchers who had active projects in the period 2010-2016 in private enterprises and public and private higher education institutions (H.E.I.). Table 2: Origin of Innovation Ideas in Services Enterprises, shows the number of ideas of innovation originated in universities and services enterprises in the period 2008-2013. Table 3: Percentage of Enterprises that Invest in Activities that Promote Innovation, shows the percentage of all Colombian enterprises that invested in activities that promoted innovation in the period 2009-2015.

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