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CRITICAL SUCCESS FACTORS IN SCIENCE AND TECHNOLOGY PARKS: A BIBLIOGRAPHIC REVIEW AND ANALYSIS

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ABSTRACT

Science and Technology Parks (STPs) are of great importance in the business context of the region in which they carry out their activity. They are one of the main mechanisms of public and private initiatives for the promotion of research, development and innovation and transfer of technology. The main purpose of this type of institution is not a purely economic but also sociocultural benefit, which makes them an adequate investment from the point of view of public institutions. They promote the creation of companies and agreements with universities and research centers, generate jobs and attract technology-based companies. Therefore, they require a detailed assessment to understand their operation and generate action plans and models that new parks or those that are still in the early stages of growth may follow. Thus, this study focuses on identifying the main Critical Success Factors (CSFs) for STPs from a literature review and evaluating the importance of the main variables that appear in the literature on the advancement of STPs to group them according to its operational characteristics.

Keywords: Critical Success Factors; Scientific and Technological Park; Bibliographic Review

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1. INTRODUCTION

Scientific and technological advances have now become the mainstay of a country's socio-economic development. As science and technology become more and more key players in competitiveness and economic growth, the development of regional policies and strategies for innovation is observed. The interactions between producers and consumers of knowledge and research-based skills are becoming a central issue, promoting the application of scientific research and closer ties between the university and industry (MINGUILLO; TIWSEN; THALLWALL, 2014).

Thus, the discussion on the theme evolves to the latent need to create physical spaces with infrastructure and culture for innovation, to facilitate interactions between universities, research centers and companies, a kind of innovation habitat. In this context, Science and Technology Parks (STPs) play an important role because their existence represents a considerable factor in the competitiveness of the economy of a region or country, as well as a field for business investment.

In general, the International Association of Science Parks (IASP) defined Science and Technology Parks as an organization whose objective is to develop its community, promote a culture of innovation and the competitiveness of its business, integrated with institutions motivated by formation and growth of knowledge-based industries. With ties to universities, research centers and higher education institutions, science parks are created to facilitate the commercialization of technologies, stimulate development based on technology and promote regional development.

From the growth in the interest of these innovation habitats, the study in Science and Technology Parks has been widely discussed and the number of related works have been growing and attracting attention in recent years (VÁSQUEZ-URRIAGO et al., 2014), where topics such as innovation and business location in STPs have become, become more relevant.

The authors, in general, investigate the role of STPs in society, in related companies, in universities, in installed regions and what benefits are perceived. However, it is difficult to carry out a detailed evaluation that understands the operation of Science and Technology Parks, especially when it is desired to quantify their success in generating plans of action.

It is still weak in the literature models that synthesize the knowledge accumulated on scientific parks in a scheme that allows concrete recommendations, since the parks are not objects of global consensus because there is no standard of evaluation accepted by the majority.

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In this context, the analysis of the results generated by the Parks becomes imperative, broadening the debate around their actions and their knowledge, potentializing their effects, reducing failures and contributing to the definition of public policies and financial investments aimed at all phases of development of the park, mainly in the initial phase and the implementation of the project, where the missions, the guidelines and the objectives of the projects are defined. Giugliani (2011) argues that successful technology parks operate from a clear and well-defined strategy.

According to the opinion of some authors, such as Zhang (2004), Kharabsheh (2012), Hwang, Zhu and Tan (2017), there are several gaps, obstacles and factors during the development phases of the parks. Thus, it becomes fundamental to understand the aspects that can favor the planning, management and operation of technological parks, analyzing the main barriers and obstacles faced, in order to promote their performance and success.

Thus, the objective of this paper is to deepen the study on the critical success factors of Scientific and Technological Parks through a bibliographical review of the literature. This study focuses on (i) identifying the main Critical Success Factors (CSFs) for STPs found in the literature and (ii) evaluating the importance of the main variables that appear in the literature on the progress of STPs to group them according to their characteristics.

The first section presents the contextualization and the objective of this research. The second section discusses about the STPs and their great importance in the regional business context. The third section discusses the importance of defining parameters for the analysis of the critical success factors of STPs. The following section presents the research methods, which included the systematic bibliographic review of analysis of publications and approaches. The fifth section presents the research results, which include the contextualization of the scientific works present in the database based on the bibliographical analysis and also the identification of the set of factors/variables that influence the success of a STP and the companies hosted. Finally, the last section presents the conclusions of this study.

2. SCIENTIFIC AND TECHNOLOGICAL PARKS

One possible policy to be adopted to promote economic development is the creation and development of science and technology parks. Parks' initiatives have as their main objective to promote cooperation and technology transfer, especially between companies and knowledge providers, such as universities and research. Assuming that agglomerations of

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companies, universities and other knowledge-intensive organizations are beneficial to the generation and use of knowledge. This thinking has been used to justify the development of Science and Technology Parks.

Countries in general and especially developing countries have seen a very high occurrence of science parks in the last decade, resulting in the promotion of regional innovation and economic development (LI et al., 2016), which later created new jobs, access to inputs and specialized labor (ALBAHARI et al., 2017), knowledge transfer (DÍEZ-VIAL; MONTORO-SÁNCHEZ, 2017; ALBAHARI et al., 2017), Research and Development (R&D) opportunities (ŞIMŞEK; YILDIRIM, 2016), innovations and entrepreneurial activities and the emergence of small and medium-sized enterprises with a greater role of information and communication technologies (WASIM, 2014; FUKUGAWA, 2013). STPs also provide procedures to promote and stimulate trade and industry innovation, encourage re-industrialization and sustainable regional development (KHARABSHEH, 2012),

In sum, scientific and technological parks have been mentioned in the literature as an important tool to stimulate local development by contributing to the creation of qualified jobs, disseminating knowledge to a region and encouraging the creation of small and medium enterprises. In this sense, science and technology parks as well as the link with small and medium sized enterprises are of great importance in the business context of the region and play a key role in their development.

Zouain (2015) indicates that technological parks can be important inducers of qualification in degraded and depressed areas in large urban centers and that one of its main contributions to society is urban development and should promote improvement in the quality of life in such a way that the leisure and well-being of the citizens of the region where the park is installed are the priority. However, the contributions of the parks in the region where they are inserted is something that should be considered in the long term. In the case of regional development, some factors must be observed for the construction of economic development, such as employment index, income, social issues, income inequality, monetary wealth, education and health.

Academic studies tend to be quite critical when judged in terms of technology development or urban renewal in actual performance (FAZLZADEH; MOSHIRI, 2010). Soenarso et al. (2013) and Hu, Lin and Chang (2005) identify technology parks as tools to

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promote local sustainable development through positive changes in the correction of economic and social problems.

In addition, universities have seen in STPs an instrument to facilitate the commercialization of academic research, to generate financial returns from academic research (LINK et al., 2007). Caldera and Debande (2010) argued that the presence of the university in a technological park helps the university increase R&D income. However, some authors make reservations regarding the involvement of universities in technological parks. Hansson (2005) and Albahari et al. (2017). Two relationship mix scenarios (university-government, government-industry) appear to be most effective (LI et al., 2016).

Investments in technology parks are being adopted as a matter of public interest under the justification of promoting the development and economic indicators of the places in which they are located, impacting society in economic terms, generating jobs, etc. Dedicating resources to science parks as policy instruments designed to promote innovative and research-based industrial activities, and can act in a variety of ways in the entrepreneurial ecosystem. The main one is with the planning and implementation of policies to promote entrepreneurship and innovation. However, the critical challenge for the government lies in the creation of positive social interventions and innovative forms of policies that effectively bring benefits to entrepreneurs and the region (DHEWANTO et al., 2016).

3. CRITICAL FACTOR OF THE SUCCESS OF THE STP

Much of the research involving the Technological Parks deals with theoretical issues, context, policies, feasibility, regional development, investments and national and international relations with various stakeholders. Albahari et al. (2017), and Löfsten and Lindelöf (2002), however, do not yet know of consolidated indicators or homogeneous assessment models involving the complexity and difficulty of identifying the relevant factors to successfully achieve the organizational efficiency and effectiveness of STPs (DRABROWASKA , 2011).

So, in fact, the challenge is to define the success of STPs in a way that allows comparisons between them. Kharabsheh (2012) argues that it is difficult to quantify the economic and financial impact of a technology park, especially since there is no established definition of success or a standard way of testing business development.

The technological park is a project, and like any project, the evaluation of its effectiveness and efficiency is essential for the positive performance of the enterprise.

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Therefore, conducting research that addresses the process of evaluating technology parks is essential for obtaining information on performance and for confirming the effects produced by these institutions and how they can be translated objectively.

Drabrowaska (2011) emphasizes the importance of considering the development phase in which the technological park is located, in order to elaborate an adequate model of evaluation, being essential to understand and the most important objectives for the scientific park and then to evaluate its performance in objectives, using a set of performance indicators.

Fernandes (2014) emphasizes the importance of the evaluation of technological parks, and the literature has proposed a rational way of evaluating the performance of technological parks. In order to evaluate whether there are significant statistical differences between companies, some performance indicators such as number of jobs, turnover, innovation and R&D and company survival rate (LÖFSTEN; LINDELÖF, 2002). Therefore, the use of critical success factors, as support for the management of the implementation of STPs, is part of a methodological strategy. Initially some definitions of critical success factors will be presented to then detail the factors present in the management process and in the implementation of Science and Technology Parks.

The success criteria for STPs can vary from project to project, as they depend on the context and perspectives of the various stakeholders, as well as factors such as time, cost and quality. Success criteria should be clearly defined before the project begins, after considering the contributions of key stakeholders. Therefore there are many variables that can affect the implementation of the parks, such as the context of the internal organization and the external environment in which the project is executed. Failure to strategically manage important projects can limit the potential for successful installation and competitive growth of a business (BERSSANETI; CARVALHO, 2015).

Increasing the competitiveness of an organization can be encouraged by identifying and evaluating its CFS. Once these are identified, organizations can refine them by highlighting the factors that generate the most value for their customers and sustain them at a level of competitive advantage. In addition, understanding CFS is unquestionably necessary for companies to plan for growth targets. Therefore, the definition of a specific list of CFS for the development and implementation of Science and Technology Parks is important to achieve the ideal project performance throughout the entire life cycle.

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However, investigating the critical success factors in STPs is complex because they present some challenges. Firstly, the lack of methodologies, parameters, processes and tools in the context of STPs that reflect the complexity and diversity of the established links, which makes it difficult to adopt a widely accepted model of comparison and identification of critical aspects associated with the performance of different parks . It is then difficult to ensure that a park is generating value for the installed companies and also to assert whether factors such as the park managers team, proximity of companies with the university, and other actors can effectively help a STP become more effective and provide greater cooperation among stakeholders (BIGLIARDI et al., 2006, LÖFSTEN; LINDELÖF, 2002).

In general, Vásquez-Urriago et al. point out that there is no conclusive empirical evidence regarding the performance of parks and critical factors for the implementation and development of a STP. Therefore, to better synthesize and identify the Critical Success Factors present in the process of management and implantation of Science and Technology Parks will be used nine parameters presented in Table 1. These parameters were based on studies relevant to this area and could be used for the analysis factors.

Table 1: Definition of the parameters for the analysis of critical success factors

1. Governance and management of the park
Guidelines for park planning, development, management and operation
Competent, high-quality management and organization
Strong commitment and support from top management
Ability to clearly convey the goals, goals and challenges of the park
Long-term economic development plans and strategies
Creation of a favorable environment for companies located in the park
Realistic and well-planned project schedule and adequate allocation of resources.
2. Infrastructure and location
Physical infrastructure, transport and services for the installation of companies
Social infrastructure, interaction environment and qualification for stakeholders
Communication infrastructure and high technology conducive to the diffusion of knowledge
Geographical proximity and promotion of innovation and local economic development
3. Economic environment of innovation and entrepreneurship
Implementation of regional, national and international innovation policies
Fostering a culture of innovation and entrepreneurship through collaboration
Presence of dynamic and diverse companies in size and segment
Promoting regional economic development and diversification of the economy
Focus on technological change and increased job opportunity
Attracting new businesses, companies, R&D capitalization
Environment conducive to interaction between people and business
Academic, technological and economic income development

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4. Economic, financial and incentive factors
Financial incentives: access to funds and subsidies, tax exemptions, etc.
Access to university assets such as R & D equipment and qualified personnel
Capturing Assets Required During Development and Operations of a Park
Responsibility to understand and facilitate the different types of financing and financial resources your tenants need to survive and grow
Flexibility in economic-financial modeling to attract new investments.
5. Business Services and Support
Services that enable the growth of incubated companies and the park
Incubation and business training and network support throughout the value chain
Access to business opportunities inside and outside a science park
Promotion of training and professional development programs
Offering financial support and resource management services
Consultancies in strategic planning, business plans, business management in marketing, sales, finance and resource management.
Nuclei specializing in technology transfer and innovation management
Generation of specialized professionals and qualified work opportunities
6. **Culture**
Environment that promotes the exchange of knowledge and effective networking
Respect to the characteristics and culture of the region where they are located
Active relationship between managers ensuring effective marketing and opportunities
Effective and mutual relationship between park actors and tenants
Emphasis on the exploration of technology and the link between research and the market
Shared vision and exchange of information among the actors of the technology park
Trust, visibility, mutuality and communication between stakeholders
7. Influence of stakeholders
Support from powerful, dynamic and stable economic actors
Influence of funding agencies, political institutions, regional and national development authorities, universities, companies, R&D organizations, etc.
Promotion and formation of cooperation networks for research and technological innovation
Establish relationships that drive business-relevant research
Develop joint projects to promote the transfer of knowledge
Laboratories and shared equipment to facilitate stakeholder access
Collaboration of shared resources and strong networking initiatives
8. Government Support
Extensive support through government subsidies, mainly in the initial phase
Offer longer term loans and lower interest rates than other institutions
Assist scientific parks to broaden the incentive horizon for tenants
Planning, control, development, regulation and promotion of parks
Facilitating role of local government in attracting companies
Development of policies and proposals that eliminate the weak characteristics of the regional economy and foster its development

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9. Features and definition of park design
Project type, size, complexity, resource allocation, deployment, etc.
Planning and control, team structure and integration, and contractual aspects
Support critical activities, budget and risk management
Quality and safety program, schedule and work schedule
Main objectives of the park, such as technological relevance, regional development, university-community relationship, teaching, research and extension.
Competence of the project team: Experience, commitment, work relationships, educational level, training and effectiveness in decision making.
Implementation of the project with adequate planning and control, apt and committed management; correct estimates and realistic expectations

Source: Adapted from Zhang (2004), Vedovello (2000), Comins and Rowe (2008), Drabrowaska (2011), Kharabsheh (2012), European Commision (2014), Talib, Hamid and Zulfakar (2015), Berssaneti and Carvalho (2015) and Hwang, Zhu and Tan (2017).

4. METHODOLOGICAL RESOURCES

This research is characterized as bibliometric, with an exploratory and descriptive character. The bibliometric analysis offers statistical metrics that are able to identify similarities and interest groups related to the proposed theme. Just as it is able to show probable visions of a particular area of research. It is also possible to visualize the dissemination and flow of information, identifying patterns and trends, as well as considering the main research in the area and its contribution to scientific knowledge (BORNER et al., 2007). Exploratory and descriptive research, according to Collis and Hussey (2005), is one that describes the behavior of phenomena and establishes relationships between variables.

This study focused on carrying out a bibliographic review on the themes related to technology parks, through a critical review of the main organizational competencies and resources generated by the installation of parks in certain regions. Evaluating the most frequent critical success factors in STPs, with the objective of meeting the general objective of this study. According to Dal (2015), the methodology proposed for the development of this study will combine different theoretical perspectives.

In this study, the research procedures used will have reference in the procedures used by Guadix et al. (2016). The choice of the Scopus base is due to the fact that it includes the journals that most publish studies of the areas of Production Engineering (Marasco, 2008).

Research was carried out in periodicals without temporal delimitation of published studies to verify the evolution of themes over the years. The following keywords were defined for the bibliographic review, as shown in Table 2. The search resulted in a sample of 24

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publications, which were submitted to the selection filter, which included the application of the inclusion criterion by reading the title, abstract, and keywords. Next, a selection filter was applied related to the type of document, in which only papers were selected, since only those papers undergo peer evaluation in their full version. After the application of this filter, the sample was reduced to 13 papers.

Table 2: Keywords of the survey carried out in the Scopus database.

Critical Success Factors	Science and Technology Park
"Success Factors" OR *"Success Variables"* OR *"Critical Factors"* OR *"Critical Variables"* OR (*Critical* AND *Success* AND *Factors*)	AND (*Science* AND *Technology* AND *Parks*)

Source: Own authors.

In the same way as Guadix et al. (2016), which grouped the main variables that appear in the literature regarding the advancement of STPs, this bibliographic review made it possible to synthesize some criteria to identify: (i) the main contributions of STPs; (ii) how research on the subject is developing; (iii) what factors the main actors are related to a successful STP; and (iv) parameters for the analysis of critical success factors. These four components were used in this paper as the basis for the processes of identification of the CSF.

Nine factors were identified in the literature that will be used in the next phase of the study, when it will be sought to identify and organize the structural components for the search in the search for information that supports or contests the information found in the literature:

1. Governance and management of the park;
2. Infrastructure and location;
3. Economic environment of innovation and entrepreneurship;
4. Economic, financial and incentive factors;
5. Business services and support;
6. Culture;
7. Influence of stakeholders;
8. Government support; and
9. Features and definition of park design.

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Therefore, the study will seek to propose a model with the use of guidelines and parameters previously analyzed to elucidate the CSF of technological parks. In this way, it is understood that the use of these guidelines may help in the planning, structuring, implementation, management and operation of the Technology Parks, contributing to the planning of actions and directing strategies for the implementation of the Parks.

5. RESULTS AND DISCUSSION

Table 3 addresses the contextualisation of the paper present in the Scopus database based on a review and bibliographic analysis.

Table 3: Contextualization of papers from the bibliographic review

Paper	Contextualization
Guadix *et al.* (2016)	Guadix et al. (2016) analyzed STPs in Spain, selected their operating strategies and established a series of models, in order to identify the success strategies of these parks. Selected STPs outperformed the initial stage and deal with high revenue volumes, high occupancy rates, and large numbers of employees.
Tsai and Chang (2016)	Tsai & Chang (2016) gathered relevant studies and research on the theoretical context of regional innovation systems and factors affecting the operational effectiveness of STPs. To do so, they used the analytical hierarchy process (AHP) to evaluate the critical factors of regional innovation systems.
Čížek (2015)	Čížek (2015) has developed a study focused on the factorial analysis of critical location of STPs in the Czech Republic. The analysis investigates four main factors of critical location: Proximity to the international airport, Proximity of capitals, Good road network and Good rail connection to capitals.
Keshtegar and Rahimi (2015)	Keshtegar & Rahimi (2015) identified the crucial factors for the success of new product development in small and medium-sized enterprises located in Khorasan Science and Technology Park, Iran. The study population was a combination of specialists and managers working in industry, with a sample of 59 companies.
Fikirkoca and Saritas (2012)	Fikirkoca & Saritas (2012) discussed the success factors of STPs, suggesting that a three-dimensional political structure that includes: 'network economies' 'complementarity' and 'strategic scaling positioning' is taken into account during project and operation of the parks.
Colapinto (2011)	Colapinto (2011) has mapped the success factors of Italian STPs, noting that in the Milan sub-region there are clear trilateral trilateral networks, in which hybrid organizations are created to facilitate the exploration and exchange of knowledge and the creation of value.
Kharabsheh and Magableh (2010)	Kharabsheh and Magableh (2010) conducted intensive interviews with six university managers, managers and university research deans to explore the obstacles to successful STPs, revealing a variety of obstacles that have reduced or inhibited the success of parks in Jordan.
Kazemi and Zafar Allahyari (2010)	Kazemi and Zafar Allahyari (2010) have reviewed relevant literature from various fields of study associated with key issues in the implementation of Knowledge Management (KM) projects. Providing an integrated perspective of CSF in the implementation of KM in Khorasan Science and Technology Park (KSTP) and guidelines for managers and leaders to conduct KM projects effectively.
Ratinho and Henriques (2010)	Ratinho and Henriques (2010) analyzed the population of STPs and business incubators (BI's) located in Portugal in promoting economic growth through a case study. The authors sought the success factors of Portuguese STPs and BI's and confirmed that university links and management adequacy are critical to the success of STP or BI.

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Lendner and Dowling (2007)	Lendner and Dowling (2007) used data from a Global University Business Incubators (UBI's) survey to examine UBI's main objectives, organizational structure and business strategies and their impact on incubator companies. The authors provide a conceptual framework based on network theory to examine the success factors for start-ups in incubators. This paper presents the results of a survey of over 300 UBI's worldwide.
Chen and Huang (2004)	Chen and Huang (2004) adopted the AHP method to obtain professional opinions about the strategy of selecting high-tech industries to locate in a new STP in Taiwan. The effort resulted in seven evaluation criteria. The authors also performed a sensitivity analysis to determine the critical factors that affected the priority of the alternatives.
Zhang (2004)	Zhang (2004) examined the STP management experience reflected in the literature, which focuses on the parks present in North America and Europe. The author extracted his critical factors and synthesized them into three groups: park location, park preparation and park management team.
Lin (1997)	Lin (1997) analyzed the success factors of the development of Hsinchu Science-Based Industrial Park (HSIP) in Taiwan, and the failure factors of the Hsinchu Science City project. Moreover, based on the Hsinchu experience, the institutional paradox of government-led techno-political development was also discussed by the author.

Source: Own authors.

The identification of the set of factors/variables that influence the success of a STP and the hosted companies involves creating a scenario with the papers addressed from the Scopus database on the subject. This procedure provides a list of the most recurrent variables (Table 1) in the analysis of STPs and their effects, regardless of the perspective and methodology used. Tables 4 and 5 present the parameters used by the authors researched in the analysis of the critical success factors of a STP.

Table 4: Parameters for the analysis of the CSFs of a STP (part 1)

Authors	**Governance and park management**	**Infrastructure and location**	**Economic environment of innovation and entrepreneurship**	**Economic and financial factors and incentives**	**Business services and support**
Guadix *et al.* (2016)				X	X
Tsai and Chang (2016)	X	X	X		
Čížek (2015)	X	X			
Keshtegar and Rahimi (2015)	X		X	X	X
Fikirkoca and Saritas (2012)		X	X	X	X
Colapinto (2011)					X
Kharabsheh and Magableh (2010)					
Kazemi and Zafar Allahyari (2010)	X				
Ratinho and Henriques (2010)					X
Lendner and Dowling (2007)				X	X
Chen and Huang (2004)			X		
Zhang (2004)	X	X	X	X	
Lin (1997)		X	X		

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Table 5: Parameters for the analysis of the CSFs of a STP (part 2)

Authors	Culture	Influence of *stakeholders*	Government Support	Characteristics and definition of the park project
Guadix *et al.* (2016)		X		
Tsai and Chang (2016)	X	X	X	
Čížek (2015)				X
Keshtegar and Rahimi (2015)	X			
Fikirkoca and Saritas (2012)			X	
Colapinto (2011)		X		
Kharabsheh and Magableh (2010)	X	X	X	
Kazemi and Zafar Allahyari (2010)	X			
Ratinho and Henriques (2010)				
Lendner and Dowling (2007)		X	X	
Chen and Huang (2004)	X		X	
Zhang (2004)	X			X
Lin (1997)	X		X	

Source: Own authors.

6. CONCLUSION

In this paper, a review of the literature and a preliminary analysis regarding the CSFs applied to STPs were developed. First, a bibliometric analysis was performed, where it was possible to observe how the researches around this theme have been developing and in which the context are inserted, so that thirteen papers were separated. Second, the main critical success variables were identified in the literature according to each previously defined work. In this sense, the nine variables previously proposed were observed.

The results of our analysis reveal that there is not a general consensus of the CSFs applied to STPs, since the papers are mostly case studies for a particular STP or for a given region, with many dependent variables involved, such as maturity and objectives the nature of the stakeholders involved, geographic location and the level of regional development. All these variables directly influence the CSF. In addition, the concept of success or failure is relative, and is evaluated according to established goals and objectives that have been delimited according to each author's understanding.

Thus, during the bibliometric analysis, it was first observed the place where the research was carried out, being: Spain, Twain, Czech Republic, Iran, Turkey, Italy, Jordan, Portugal, North America and Europe. This in itself is already a strong indicator that there would be no

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conformity between the CSF listed in each paper, since the reality in which the STPs are inserted is quite diverse, mainly due to the particular characteristics of each region and the obstacles faced with a STP considered to be successful, as well as the uniqueness of each one in relation to its objectives, goals and stakeholder involvement.

Ratifying this understanding, Bigliardi et al. (2006) point out that in emerging countries, STPs are expected to operate as a stimulus to the growth and development of new hi-tech companies and helping companies to survive, gain market share and innovate in products and processes, where countries often are undermined by poor infrastructure and technological backwardness in relation to major powers. Already in developed countries, parks are expected to contribute to the development of an area where economic growth has been hampered by lack of infrastructure, cultural constraints and the presence of some barriers.

Second, the main CSF related to the selected papers were observed and listed, where it was possible to observe that there is no variable that has been universally pointed out by all the authors. However, the results obtained from the bibliometric analysis were able to corroborate the previously presented research hypotheses regarding the nine variables listed and found in the literature in an unstructured way. So while the definition of STPs may emphasize different aspects, some elements seem to emerge as common denominators for most of the authors studied.

Through the Tables 4 and 5 presented above, it becomes plausible to use the parameters listed for the analysis of the CSF of a STP, since most of the variables were quoted by approximately five or six authors in a very consistent way. The only variable that was cited by only two authors was the variable that relates the characteristics and definition of the park project, where it can be highlighted as an object for a deeper study, deciding if such a variable can be removed from the analysis by not influence the success of STPs.

The present paper then provides a means of correlating the variables and the main success indicators found in the literature. In this way the paper fulfills its objectives in describing the approaches that the main papers related to the researched topic are contextualizing and, in addition, this paper can identify the main CSF for STPs and validate the main variables that appear in the literature on their advances.

As a suggestion for future work, it would be interesting to expand the research sample by including other papers that may be found in additional research databases. In addition, it is recommended to prepare a questionnaire that designs these variables and their future application in case studies that explore these variables. In order that a model can be created later, it can be used as a conceptual proposal for the management of CSF in STPs.

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