PROFILING CREATIVITY IN BUSINESS: A BIBLIOMETRIC ANALYSIS

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ABSTRACT

The main purpose of this study is to build a profile of the creativity research in business, in order to understand the scientific map of the domain. It is based on articles gather up from the ISI Web of Science database during the years 1960-2012 and the analysis is performed using bibliometric technics at three phases: 1) Titles and abstract review; 2) bibliometric analysis; and 3) Content Analysis. The study provides knowledge about the patterns, properties, and attributes at countries, institutions, authors, and journals as units of analysis. It denotes the increase of the research work in the field during the period 1996-2006, based on the articles published during the last fifty two years. Most of the Business research has been developed in the topics of organizational behaviour, organizational knowledge, organizational innovation and leadership. The results provide insights about future studies and the research agenda of individuals, research groups, institutions, and countries about creativity.

Keywords: creativity, bibliometric analysis, content analysis

INTRODUCTION

Know how firms adapt to changes in their sophisticated environments to survive and achieve corporate growth has been an important theme in organizational research. In light of incresing competition, the growth of organizations is nowadays strongly related to their creative capabilities. Stimulation of creativity has long been assumed to enhance innovation. Furthermore, creativity has been accepted as a key element of innovation (Amabile, et al., 1996).

In this context, based on the importance of creativity for innovation, extensive research has studied key factors enhancing employee creativity (Hon, 2011; Binyamin & Carmeli 2010). For example, Bharadwaj and Menon (2000) find that the presence of formal approaches and resources to stimulate creativity improves the innovation performance. Firms require a strategy of “creativity management” to support five major organizational dimensions under which sit characteristics and behaviours that enhance creativity in a work enviroment. Those dimensions are organizational climate, organizational culture, organizational structure and systems, leadership style, and resources and skillls. Creativity has been defined as the ability to produce something new through expertise (Knowledge, proficiencies, and abilities of people to make creative contributions to their fields); creative-thinking skills (cognitive styles, cognitive strategies, and personality variables), and intrinsic task motivation (the desire to work on something because it is interesting, involving chalenging and rewarding) (Amabile, 1996).

Despite the importance and the key efforts made to increase our understanding about creativity and innovation; is notable the scarcity of bibliometric studies that allows the assessment of the scientific field's research productivity in a systematic way.

Bibliometric methods have been used in different disciplines (García Merino, Pereira do Carmo & Santos Álvarez, 2006; Keiser & Utzinger, 2005). Bibliometric techniques use quantitative analysis to describe attributes and patterns in research fields (Abramo, D'Angelo, & Caprasecca, 2009). These analyses take the bibliographic data from literature (Palvia et al., 2004) and obtain patterns and properties of the research fields (Li, Ding, Feng, Wang, & Ho, 2009) in a more objective way (Aksnes & Taxt, 2004). Research profiling is a bibliometric method that supports and enhance traditional research reviews, and scan contextual literature to obtain a better understanding of a field of interest (A. Porter, Kongthon, & Lu, 2002). This method has been used in different studies such as in mining external R&D (A. L. Porter & Newman, 2011), research activities (A. L. Porter, Schoeneck, Roessner, & Garner, 2010), specific technologies (Guo, Huang, & A. Porter, 2010), and technological opportunities (Yoon, 2008). In order to explore the scientific research structure, patterns, and properties of the cretivity, we believe is necessary a research profiling analysis that supports researchers in the achievement of their purpose.

The aim of this paper is then, to profile the patterns and properties of Creativity analyzing the research papers published and indexed in ISI Web of Science (WoS) at three levels: general, subject area, and core topics. The objective is to find useful information that serves researches to develop future research, social research networks, research agendas, research policies, but specially to get involved about the insights of the intellectual structure of the scientific community who care about creativity management field.

The paper has the following sections. Firstly, we described the methodology used in the research profiling analysis. Secondly, we describe and discuss the results. And finally, the conclusions section states our conclusions, limitations and future research.

[Data and Method]

The data used in this study was retrieved from papers published in academic journals indexed in the Social Science Citation Index (SSCI) from the ISI Web of Science (WoS) database, from January 1960 to March 2012. As Bayer & Folger (1996) and Braun, Schubert, & Kostoff, (2000) says, ISI WoS is an important research information database used in different bibliometric studies. The time frame was chosen according to the importance that creativity is having in business literature in the last decades.

The papers were collected using a simple search equation that includes only the word creativity in the topic field and they were refined by the WoS categories called business and economics. We then focused our attention on the document types of articles and reviews -excluding proceeding papers- selecting 155 papers because they were the most cited. Finally, we read the title, abstract, and introduction of each paper to exclude documents that were not related to the theme under consideration, which result in 136 papers to be analyzed.

The data analysis was done using the research profiling method (A. Porter et al., 2002), with the main purpose to discover trends and topic relationships in order to understand better the research domain. We include a general, subject category, and topic analysis, adapting a procedure used by Choi, Lee, & Sung (2011). The general analysis provides knowledge about the patterns in the published articles during the time frame chosen, showing chronological trends and behaviour of countries, institutions, authors and journals as units of analysis. The second analysis is done using the ISI WoS filter for subject categories. Finally, for the topic analysis, we assumed that keywords are reflections of researcher´s ideas based on Callon, Courtial, & Laville (1991), so we used them as unit of analysis.

[Results and Discussion]

General Analysis

The pattern of the literature related to creativity in papers published by year is plotted in Figure 1. The trend line shows that the number of publications behaves normally distributed during 1961-2010. The quantity of papers published in 2003 (13 articles) is higher than any other period. From the sixties to the early nineties, the frequency of publication kept stable and almost nonexistent, but since 1996 appears a general growth in the number of published articles. The rise on the periodicity of publication remains until 2007, as an evidence of the interest of different actors to continue developing the research. However, in recent years, this tendency has decayed significantly.

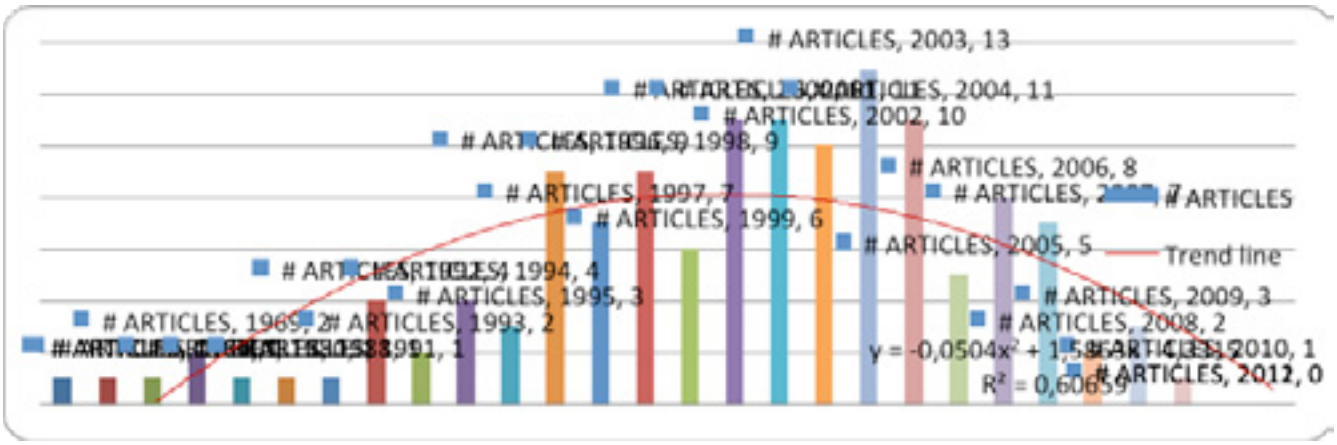


FIGURE 1. SCIENTIFIC PRODUCTIVITY FOR CREATIVITY IN BUSINESS.

We found 16 countries involved in the 136 articles selected (Figure 2). The United States of America is responsible for most of the scientific publications. United Kingdom and Netherlands follow it and these three are the only countries over ten published articles, even though the gap between the first and the other two countries is considerable. When adding the countries by region, North-America is the most prolific region (89 articles, two countries), followed by Europe (36 articles, 7 countries), Asia (8 articles, 6 countries), and Australia (one article, and one country); there is not contribution from Latin-American countries in the field.

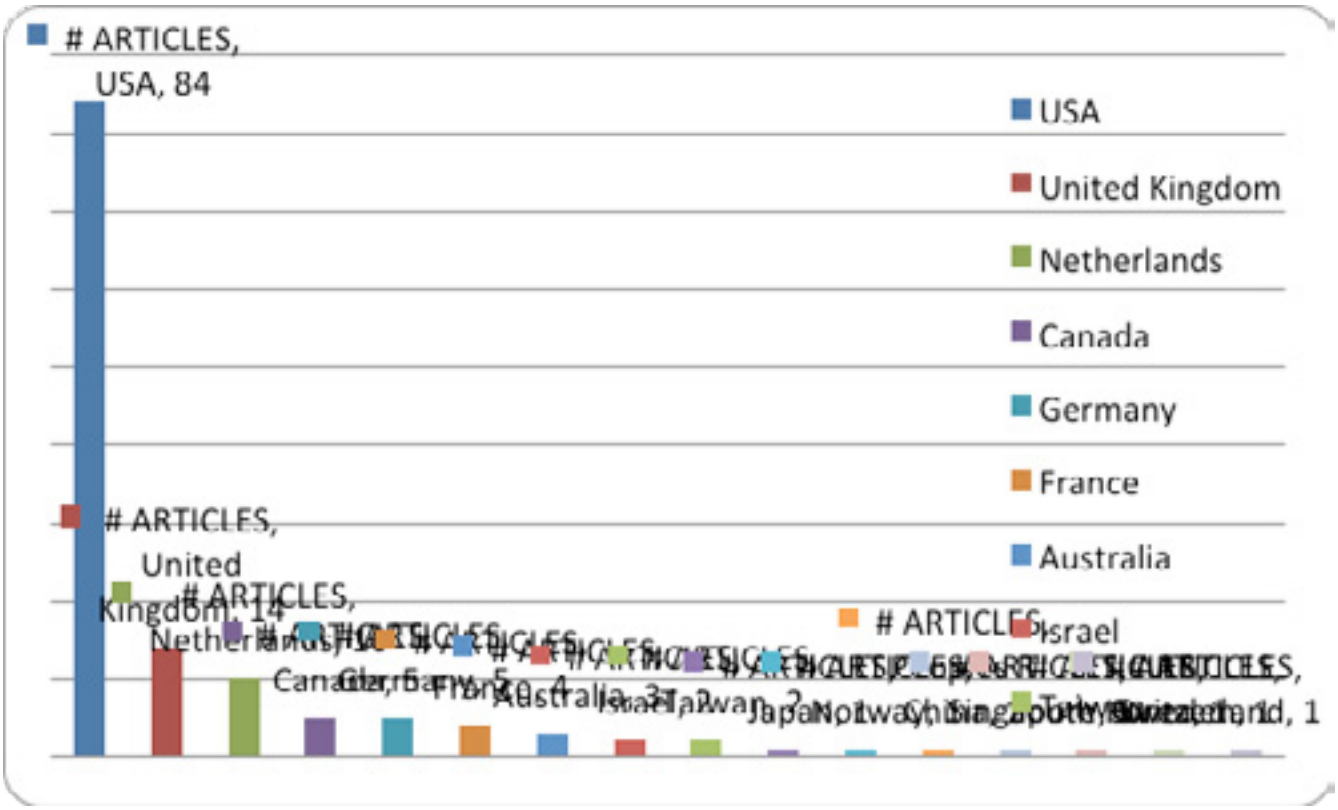


FIGURE 2. CREATIVITY LITERATURE BY COUNTRIES.

Figure 3 shows the relationship between authors, using their country of origin. As one can expect, dealing with the fact that USA is the most prolific country, it is too the country with the most complete network. In general, we found scarce collaboration in the research activity about creativity.

117 institutions contributed to the 136 articles. From them the most representative are the Rice University, Georgia Institute of Technology, and Harvard University (twelve, seven and six articles respectively), followed by Portland State University, and Texas A&M University (five articles each). The productivity at institutional level is more flat distributed, so, there is not a specific institution with a high share of the published articles as the USA case at the country level. We found 16 institutions with more than three records published, from which twelve are from USA, two are from Netherlands, and only one corresponds to the countries of France and UK. Some other prolific countries, showed in Figure 2, such as Canada and Germany do not have a prominent institution with a high productivity. Figure 4 shows that interaction between institutions are scarce, as well as we found in country analysis. The relationship between Portland State University and Wichita State University is the most prolific with four published papers, followed by the collaboration between Rice University and Texas A&M University, as well as, the union between Georgia Institute of Technology and University of Connecticut, with three publications each.

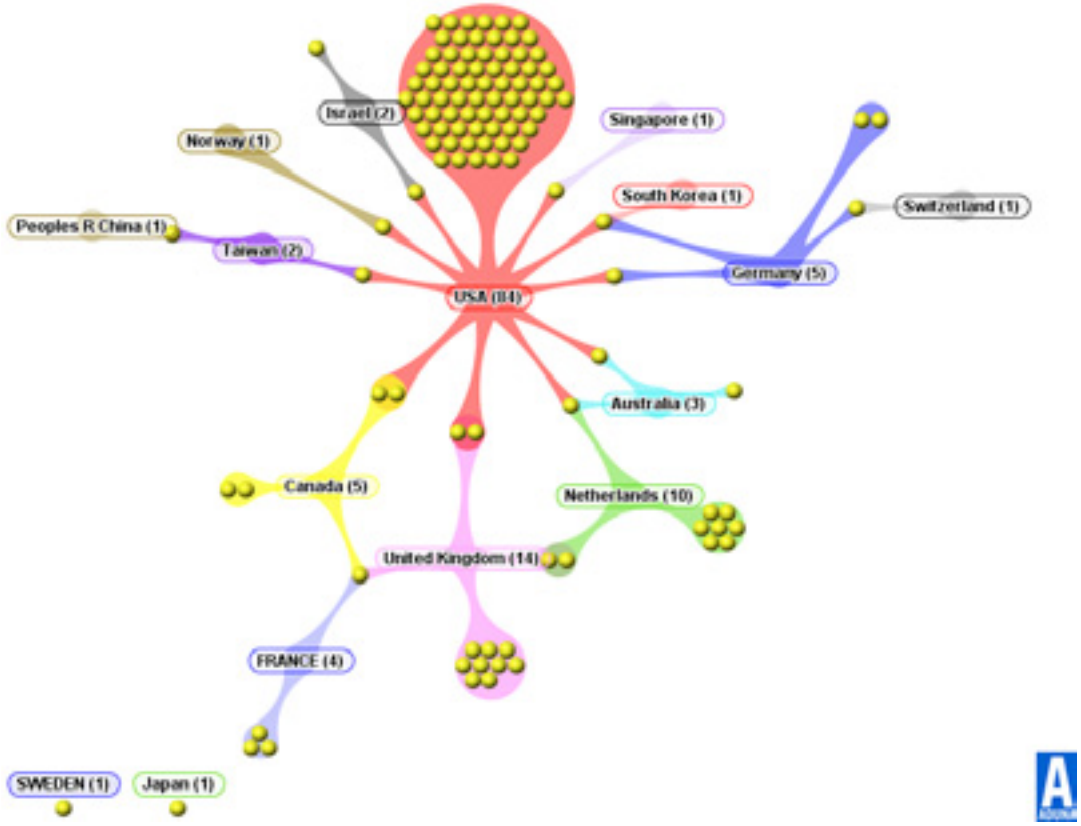
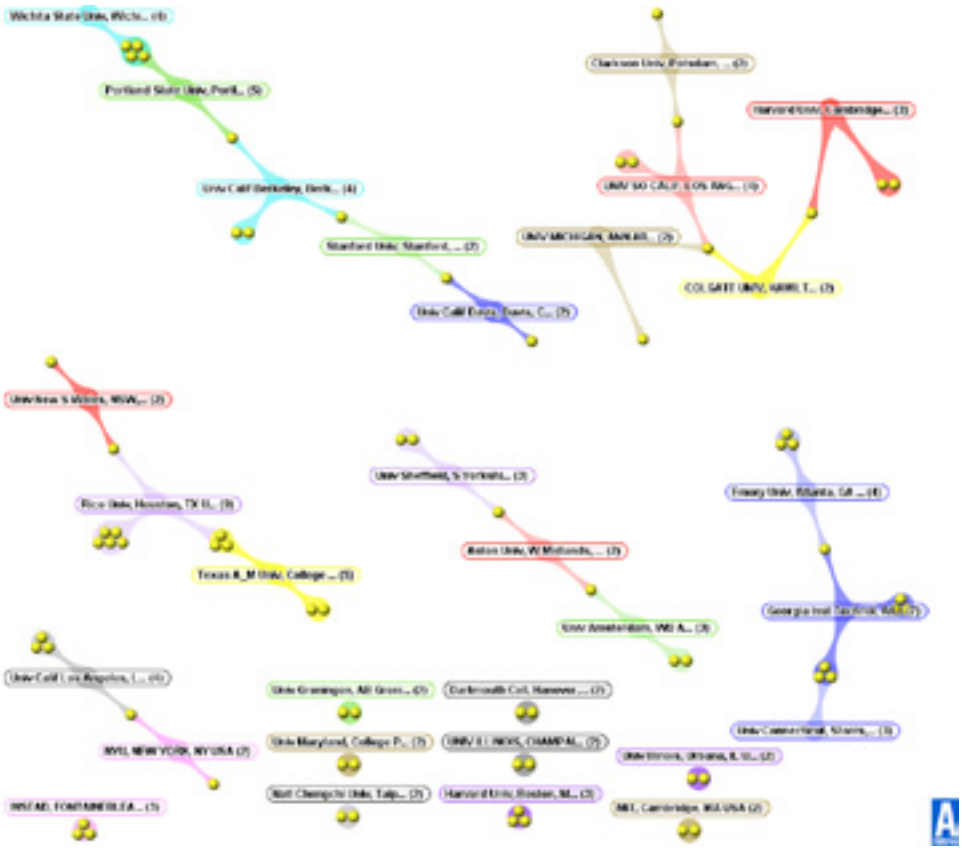


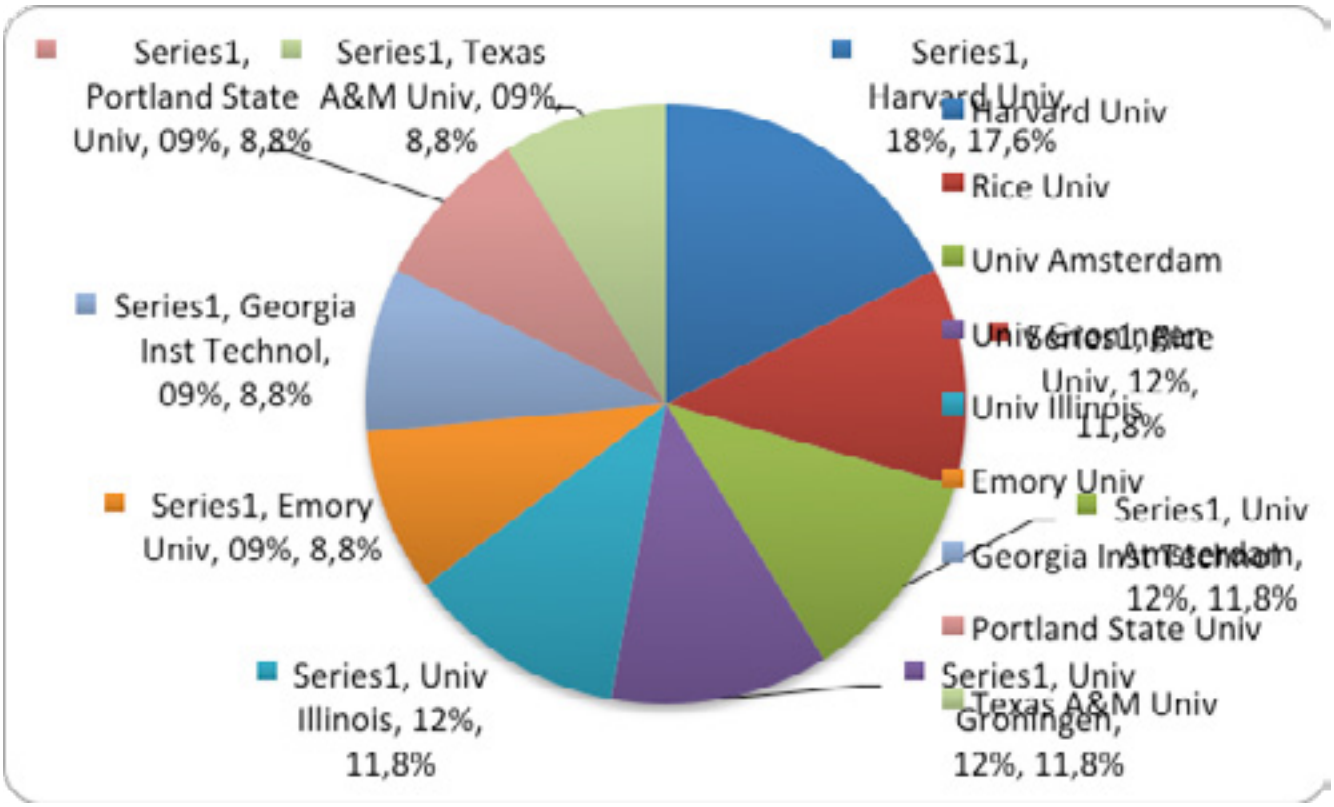
FIGURE 3. ADUNA OF PAPER PRODUCTION BY COUNTRIES

FIGURE 4. ADUNA OF PAPER PRODUCTION BY INSTITUTIONS.



The 117 articles have been written by 238 authors. From them, 215 participate in only one article; 11 and 5 are authors on two and three articles, respecively. Tierney P, Gilson LL and Farmer SM have four articles each, George SM have five, and seven papers were written by Zhou J and Amabile TM. The most prolific author in this topic is Shalley CE with eight publications. As one can noticed, there are not prominent authors with high gaps in productivity. Figure 5 shows the affiliation of first authors, excluding universities with less than three articles published; Harvard University is number one (17.6%, 6 articles), followed by Rice University, University of Amsterdam, University of Groningen, and University of Illinois (11.8%, 4 articles, each).

FIGURE 5. FIRST AUTHOR AFFILIATION.



The articles were published in 37 journals. In general terms, these journals are related to management and human behavior. Two of them represent about 28% of the total productivity in the research stream about creativity; they are the Academy of Management Journal (24 articles) and the Journal of Applied Psychology (14 articles). Harvard Business Review and Leadership Quarterly are next (8 articles, each), followed by Organization Science (6 articles).

Subject Category Analysis

The 136 articles are classified into the WoS category called business and economics. Additionally, 72 of them are classified in other nine different subject areas, being Psychology the most prolific (43 articles published). It is interesting to notice that we found unexpected related areas as Geography and Library Science (Table 1).

SUBJECT CATEGORY	# ARTICLES	JOURNALS
Psychology	43	J. of Applied Psychology (14), J. of Leadership Quarterly (8) , J. of Management (4), J. of Organizational Behavior (4), Organizational Behavior and Human Decision (4)
Computer Science	5	Mis Quarterly (4), J. of Management Information Systems (1)
Engineering	5	J. of Product Innovation Management (4), J. of Engineering and Technology Management (1)
Geography	5	Regional Studies (4), J. of Economic Geography (1)
Information Science & Library Science	5	Mis Quarterly (4), J. of Management Information Systems (1)
Environmental Sciences & Ecology	4	Regional Studies (4)
Operations Research & Management Science	2	Management Science (2)
Public Administration	2	Research Policy (1), Long Range Planning (1)
Social Sciences - Other Topics	1	Human Relations (1)

TABLE 1. PRODUCTIVITY BY SUBJECT CATEGORIES

Some subject category are related to each other, at the same time they are with with Business & Economics area. It is the case of Computer Science category with Information Science & Library Science category. Also, Environmental Sciences & Ecology Geography with Geography area.

Column 2 of Table 1 shows the top five of most prolific journals by subject area, excluding business & economics. The analysis offers interesting information because, without counting twice these articles from areas which are related, every category has a diferent journal leader.

Core Topic Analysis

In the 136 articles we found 409 author's keywords. Table 2 shows the top twelve of most used keywords in ten or more articles, giving information about the most studied concepts and ideas behind the researcher minds. It is interesting to notice that creativity is not the most used, even though it was the word used to filter the search. Performance, innovation, model and work are the most common keywords.

KEYWORD	# ARTICLES
Performance	44
Innovation	39
Model	30
Work	27
Creativity	25
Organizations	20
Behavior	17
Employee creativity	14
Perspective	13
Determinants	12
Management	11
Personality	10

TABLE 2. PRODUCTIVITY BY KEYWORDS

Figure 6 shows that there is an important interaction between keywords. Of course the more used seem to be the most connected ones. It could be noticed more clearly analyzing the aduna of top ten keywords (Figure 7).

FIGURE 6. ADUNA OF KEYWORDS.

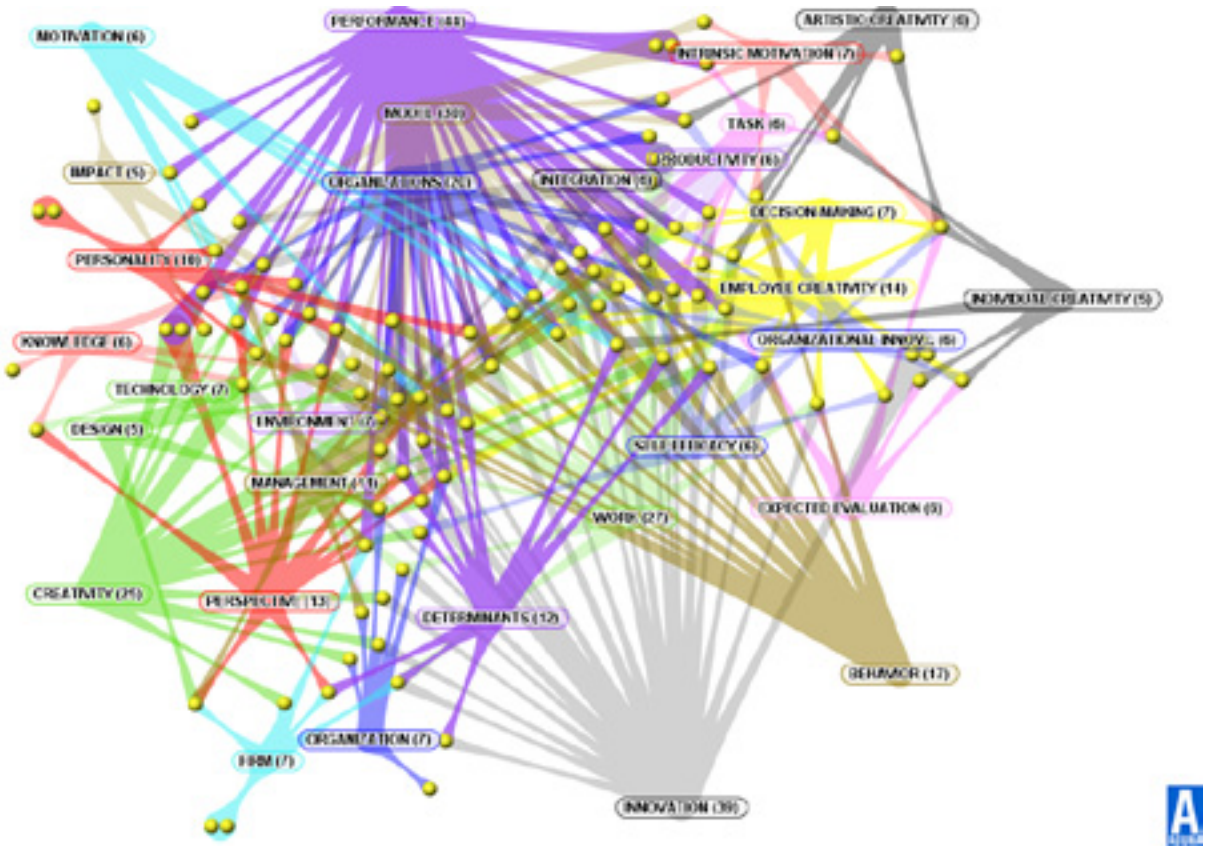
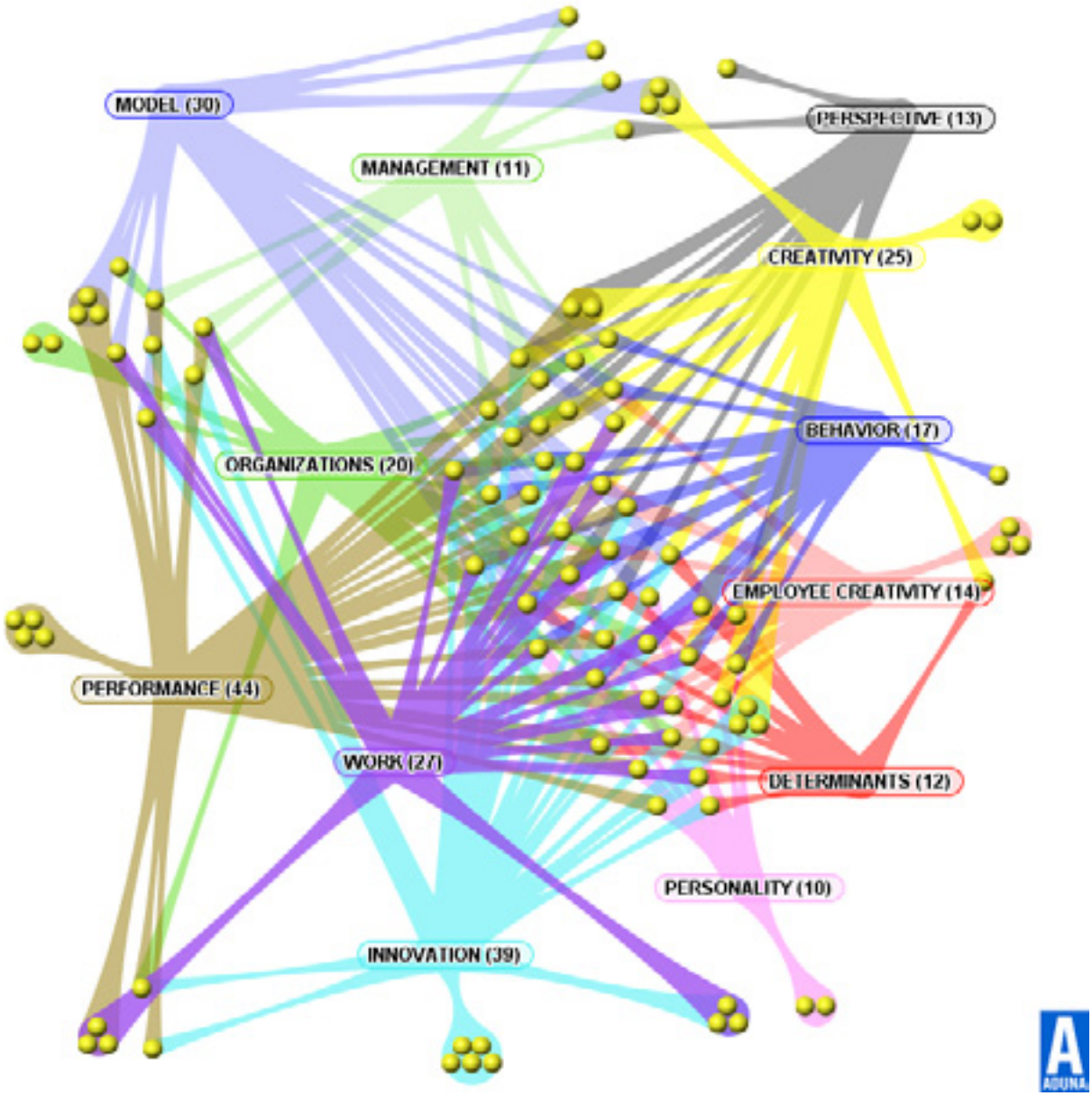


FIGURE 7. ADUNA OF TOP TEN KEYWORDS.



CONCLUSION

This work has profiled creativity using bibliometric techniques. The study is based on articles gather up from the ISI Web of Science database during the years 1960-2012, choosing 136 papers which belong to Business & Economic category. The analysis is performed using bibliometric technics at three phases: 1) Titles and abstract review; 2) bibliometric analysis; and 3) Content Analysis.
Literature about creativity were originated mainly in USA, with Rice University, Georgia Institute of Technology and Harvard University as the most prolific institutions. Furthermore, thee majority of them were published in Academy of Management Journal, Journal of Applied Psychology, Harvard Business Review and Leadership Quarterly.

The scientific productivity about creativity, represented by the number of published articles in the mention databases, has increased during the period 1996-2006, comparing to previous years. However, since 2007, it has decreased showing researchers has lost interest in the topic.
There is a large consensus among researchers on the positive role that creativity, experience, intuition, and problem solving capabilities plays in the creation of innovative artefacts. Researchers suggest a distinction between high creativity projects and low creativity projects. Creative projects are characterized by intrinsic motivation, rewards, integrative capacity, and information exchange, promotion of values, cross-functional teams, team trust, and knowledge networks, among others. Even though the relevance and the key studies made to understand creativity; is remarkable the lack of bibliometric analysis that permit the evaluation of the scientific field's research productivity in a structured way.

The findings of this work can proportionate orientation about future studies and the research agenda of individuals, research groups, institutions and countries.

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