Behavioral issues in project management: a bibliometric analysis (1988-2014)

Aspectos comportamentais na gestão de projetos: uma análise bibliométrica (1988-2014)

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Abstract: Due to the growing demand for project managers, one of the main factors that impact their performance is related to behavioral aspects, namely that in which relationships and understanding between individuals in a group are key. Faced with this problem, we aim to perform a literature review on the behavioral aspects topic in project management in order to identify the relationship between behavioral aspects and project management. Therefore, we used the bibliometric methodology, and the database composing the sample was collected from the Web of Science - ISI and Scopus, since Scopus articles were also the main base in the Web of Science. Analyses suggest based on the behavioral aspects that the "human side" is an essential factor for increasing success in project management.

Keywords: Project management; Behavioral aspects; Bibliometrics.

Resumo: *A demanda por gerentes de projetos é crescente. Um dos principais fatores que impactam no desempenho desse profissional relaciona-se ao aspecto comportamental, ou seja, àquele em que as relações e o entendimento entre os indivíduos de um grupo são fundamentais. Ante essa problemática, o objetivo deste trabalho foi realizar uma análise bibliométrica sobre aspectos comportamentais na gestão de projetos, buscando identificar as relações entre aspectos comportamentais e o gerenciamento de projetos. Para tanto, utilizou-se a metodologia bibliométrica: as bases de dados que compõem a amostra foram coletadas em ISI Web of Science e Scopus, desde que os artigos da Scopus também estivessem na base principal da ISI Web of Science. As análises sugerem ou evidenciam que os aspectos comportamentais, o "lado humano", se apresenta como fator essencial para o sucesso na gestão de projetos.*

Palavras-chave: *Gestão de projetos; Aspectos comportamentais; Bibliometria.*

1 Introduction

The widespread focus of Project Management reference guides on "hard skills" (techniques and management tools) has created asymmetry regarding the adoption of research on the "soft skills" of project management (Söderlund & Maylor, 2012). Recent researches have pointed to the significant and relevant impact of those "soft skills" on project success (Carvalho & Rabechini, 2014). The use of the terms "hard" and "soft" represents opposite ends of a continuum rather than a true dichotomization or opposition itself (Gustavsson & Hallin, 2014). Indeed, significant and positive relations between hard and

soft skills in project risk management have been uncovered (Carvalho & Rabechini, 2014).

However, using this dichotomy as a categorizing method for projects, Crawford & Pollack (2004) point out that the soft side represents objectives ambiguously defined in which appreciation of relationships, culture and meaning are managed through negotiation and discussion, allowing success to be qualitatively assessed. Analogously, projects on the hard side aim to prioritize technical performance with control and monitoring; success can thus be assessed in quantitative ways.

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The use of the "hard" and "soft" dichotomization in Project Management as well as their negative implications for the development of field research has been pointed out as relevant research gaps (Gustavsson & Hallin, 2014). Concerning the abovementioned differences in management styles, behavioral aspects are not exclusive to a specific method since they are inherent to individuals who are members of a project team regardless which management style is employed. Behavioral aspects can be understood as a set of concepts related to values, attitudes, perceptions and learning that enable a possible analysis of collective and individual behaviors (Stepanski & Costa, 2012). The framing of behavioral aspects would be more robust on the soft side of Project Management defined by Liu et al. (2011) as the "human side". In many ways, behavioral aspects influence the form in which team members communicate, interact and engage with others, carry out their activities, report themselves as well as perceive their objectives and project success. Moreover, these aspects impact individuals' perception of adaptation or not to culture and organizational aspects as well as how individuals perceive leadership roles. Thus, distinct behavioral aspects not only affect how activities are executed, but are inhibitors or facilitators of such activities. Consequently, behavioral aspects are necessary elements in projects when well assessed, recognized, processed and driven by management teams throughout the project life cycle. Therefore, behavioral aspects are the ways in which individuals opt to deploy energy in order to generate their behavioral characteristics.

Kasapoğlu (2014) points out the importance of behavioral aspects in many sectors and highlights that the development of different kinds of leadership is necessary depending on the industry and on the organizational culture involved. Chapman & Hyland (2004) define leadership as a way of determining important aspects for operations in order to address a specific behavior an organization may be interested in. Eweje et al. (2012) understand that project managers have significant impact on the strategic value of the asset being delivered along with decisions made upon receiving information which provides their base. The capacity of these project managers to influence the strategic directions of organizations must not be underestimated as the costs of mismanagement can be high. In this leadership realm, Lloyd-Walker & Walker (2011) developed a model to visualize the performance of authentic leadership so that interested groups and individuals can value which factors and behaviors are important and developed by leadership.

Kissi et al. (2013) address the transformational leadership of portfolio managers in project performance as this leadership is the mediator of certain behaviors directed to success and innovation environments. Wiewiora et al. (2013) discusses how cultural differences act as drivers for knowledge exchange within projects in project-based organizations while Zangiski et al. (2013) punctuates that knowledge management is a critical success factor for organizations operating on a global scale.

Ojiako et al. (2014) understand that the impact of diverse factors such as the Iron Triangle on project assessment and professional decisions on project management contributes to a more efficient managerial decision-making. Beringer et al. (2013) write about the behavior of interested parts, stakeholder management and the impact of their behaviors on the success of project portfolio.

The impact of behavior aspects on project management is extensive by encompassing a diverse range of sectors. Lai et al. (2011) compare human resources practices adopted by safety management in construction projects in the United States and in Singapore. The authors investigate the relation between those practices and the results for safety management in construction. Wang & Yuan (2011) investigate critical factors affecting risk attitudes and behaviors of contractors in construction projects. However, within the product development fields, Norrgren & Schaller (1999) report the multidisciplinarity of product development and how leadership styles affect this multidisciplinary aspect. The authors punctuate that the leader must create an environment of positive work, develop skills of team members as well as encourage corporate competitiveness.

Regarding the relation between behavioral aspects and the development of skills, Gomar et al. (2002) point out that multiple skills are a workforce strategy aimed to reduce indirect costs from work, to enhance productivity and to reduce turnover in organizations. Fong & Chu (2006) utilize practices of sharing to improve the effectiveness of knowledge sharing in which assertiveness lies in the efficiency of sharing practices of tacit knowledge with information and communication technology, mentoring, coaching or learning programs. Litchfield & Javernick-Will (2014) investigate the international organization "Engineer Without Borders (EWB)" to learn the perceptions about knowledge an engineer must have, the gaps of which exist in member's experiences as well as advantages for the professional and personal development of engineers during the membership process in the organization.

In this scenario, the hard and soft dichotomization are relevant research gaps (Gustavsson & Hallin, 2014) and behavioral aspects have great importance in the development of work in organizations either as facilitators or inhibitors. The goal of this work is to carry out a literature review about behavioral issues in project management. With this analysis, the aim is to identify research trends and gaps, theoretical pillars as well as the most relevant and common

themes addressed by authors in this field. Moreover, an attempt was also made to understand this theme, since there are numerous publications making it difficult to establish a pattern to it. The study of the evolution of this theme throughout the years was executed using a bibliometric analysis in order to contribute with a better understanding of this field. Based on this, there is an attempt to answer how the academic evolution of the behavioral aspects in project management evolved throughout the years since its first publication.

This article is structured into five sections. The first section is the introduction to the subject to be developed. The second section delimits the research methods used. The third section explores the results of publication and networks while the fourth and fifth sections respectively present discussions and conclusions of this work.

2 Research methods

The research method adopted was bibliometrics along with a descriptive analysis of publications and networks. With these methods, it was possible do analyze the evolution of the research theme throughout the years in order to identify the main publications to better understand and distinguish them.

According to Araújo (2006), the central element of bibliometrics is the use of quantitative methods to objectively assess the scientific production. Initiated with the measurement of books, it gradually incorporated the study of other publication formats. Currently, it addresses the productivity of authors and the analysis of citations. As for this current article, publications in the form of articles are going to be analyzed.

The research was carried out using the *ISI Web of Science* and *Scopus* databases based on their relevance to the academic community since both databases hold the largest amounts of publications, have filters for document types and solely articles as well as including

only journals with double blind peer review during the submission processes (Carvalho et al., 2013; Lopes & Carvalho, 2012; Watanuki et al., 2014). A synthesis of the research process and filters adopted by both databases are shown in Table 1.

For the data collection of the initial sample, the terms "*project management*" AND "*behavio**" OR "*person**" were utilized for search in both databases.

In the *ISI Web of Science*, the filter in which the research terms would appear as subject, abstract and keyword fields was applied. As a result, 874 publications were found and then submitted to the application of other filters as per the descriptions in Table 1. These filters are related to areas of interest to the researchers including business, engineering and psychology. Only journals of impact in those areas were selected to ensure relevant sources for this research.

The application of filters to the ISI Web of Science resulted in 173 articles for detailed analysis from the analysis of their abstracts. Out of these, 87 articles were relevant to the proposed study and were selected to compose the final sample.

Regarding the search in Scopus, the same filters were applied. The filter for the search terms were applied solely to title, abstract and keywords, totaling 10452 publications. The subsequent filters are shown in Table 1. Out of 774 articles identified in Scopus, only those also indexed in the ISI Web of Science were analyzed, totaling 545 articles. Out of these 545 articles, 70 were duplicated with ISI Web of Science, resulting in 475 articles to have the abstracts analyzed. Based on relevance to the theme, 82 were eligible to compose the final sample. After all these search processes, 169 articles from both ISI Web of Science and Scopus were in accordance with the subject of this study.

Having the final sample composed, the scientific knowledge dispersion law by Bradford from 1934

Table 1. Filters used in the search process in the databases.

Databases	Filters Field	Filters Applied	Results
	Document type	Only articles	495 articles
ISI Web of Science	Categories of Web of Science	Management, Engineering Industrial, Operations Research Management Science, Engineering Civil, Engineering Mechanical, Computer Science Software Engineering, Engineering Environmental, Business, Engineering Manufacturing, Metallurgy, Metallurgical Engineering, Engineering Multidisciplinary, Engineering Electrical Electronic, Engineering Biomedical, Engineering Chemical, Engineering Aerospace, Management, Psychology Social, Engineering Industrial, Psychology, Operations Research Management Science, Engineering Civil, Psychology, Applied Business, Ethics, Engineering Manufacturing, Ergonomic e Engineering Multidisciplinary.	303 articles

Table 1. Continued...

Databases	Filters Field	Filters Applied	Results
ISI Web of Science	Source title	International Journal of Project Management, Scandinavian Journal of Management, Project Management Journal, European Journal of Operational Research, IEEE Transactions on Engineering Management, Management Decisions, MIS Quarterly, Journal of Management in Engineering, Journal of Industrial and Management Optimization, International Journal of Production Economics, Journal of Construction Engineering and Management, Industrial Management and Data Systems, Journal of Engineering and Technology Management, Management Science, International Journal of Operations Production Management, African Journal of Business Management, International Journal of Management Reviews, EMJ Engineering Management Journal, International Journal of Human Resources Management, Technovation, Production and Operations Management, Journal of Operations Management, South African Journal of Business Management, Journal of Management Information Systems, International Journal of Production Research, Research Technology Management, Supply Chain Management an International Journal, R&D Management, Project based Organizing and Strategic Management, Journal of Product Innovation Management, International Journal of Technology Management, Information Systems Research, Operations Management Research, Advances in Strategic Management a Research Annual and Omega International Journal of Management Science.	173 articles
Scopus	Document type	Only articles	3.671 articles
	Subject area	Engineering, Chemical Engineering, Psychology e Business, Management and Accounting.	2.722 articles
	Source title	International Journal Of Project Management; Journal Of Construction Engineering And Management; Journal Of Management In Engineering; Ieee Transactions On Engineering Management; Journal Of Product Innovation Management; Engineering Management Journal; International Journal Of Technology Management; Project Management Journal; International Journal Of Production Economics; Technovation; International Journal Of Production Research; Management Science E Research Technology Management.In addition to ISI Web Of Science: Journal Of Professional Issues In Engineering Education And Practice; IEEE Engineering Management Review; EMJ Engineering Management Journal.	792 articles
	Source type	Only journals	774 journals

was applied which focuses, according to Araújo (2006), on the relation between the set of journals, organizing them into a decreasing manner as per the productivity of the subject to distinguish the central journals by subject, zones and groups. From this perspective, the 20 most cited articles were identified, representing 58.03% of all citations.

As the foundation for the analysis of the articles, articles from journals with JCR (Journal Citation Reports) impact factor higher than 1.5 and published between 2011 and 2014 were considered. The impact factor is the number of citations an author had divided by the number of works cited at least once (Araújo, 2006). With this filter, 16 articles were considered for analysis.

With the selection of the sample, metadata of the articles were imported with the software *Sitkis 2.0* (Schildt, 2002); centrality and betweenness degrees were generated using the software *Ucinet for Windows – Version 6.289* (Borgatti et al., 2002) as well as the networks generated using the software *Netdraw.*

3 Results

In this section, the results of this research are presented. Firstly, descriptive information of the sample is presented followed by networks and the impact of the works using citation information and other correlated indexes.

3.1 Characterization of the sample

A first analysis of the publications aimed to map their tendencies throughout the period analyzed and which publications most contributed consolidate the field. The first article relevant to the subject was written by Badiru (1988), and published in the journal *IEEE Transactions on Engineering Management*, in which the author presents a guide to initiate software development projects using the Triple C. The goal of the author was to emphasize communication, cooperation and coordination efforts as managerial challenges.

Between 1988 and 2000, the peak of publications was in 1993 with 5 articles. However, the number of publications increased considerably since 2001. During the period from 1988 to 2014, the years with the highest number of publications were 2009, with articles (11.24% of the total), 2014 with 15 articles (8.88% of the total), 2011 and 2013 with 13 articles each (7.69% of the total each). In the period from 2007 to 2014 alone, there are 103 articles published, representing 60.95% of the total of 169 articles analyzed in this research.

In addition to the analysis of publications per year, Table 2 shows the expansion of these data by crossing information on publications and by including analysis of journals. There were 33 journals identified with relevant publications in which 5 (*International Journal of Project Management, Journal of Construction Engineering and Management - ASCE, Project Management Journal, Journal of Management in Engineering* e *IEEE Transactions on Engineering Management*) comprising 97 articles, corresponding to 57.4% of the entire sample of articles.

- **International Journal of Project Management**: with 31 articles, it covers all the facets of project management as it is focused on global expertise of techniques, practices and fields of research in Project Management.

- **Journal of Construction Engineering and Management - ASCE:** with 28 articles, it focuses on the science of construction engineering as well as standardizing practices employing theory and, consequently, progress with research and education of construction management and engineering.

- **Project Management Journal:** with 14 articles, it addresses research methods, techniques, theories and applications in projects that are state of the art. This is a journal from the Project Management Institute.

- **Journal of Management in Engineering:** with 13 articles, it seeks to present questions associated with management and leadership, having the civil engineer as a central point.

- **IEEE Transactions on Engineering Management**: with 13 articles, if offers an approach to the management of technical functions, such as research, development and engineering so as to collaborate with decision-making and with formulating policies in industry, government and university.

3.2 Citations and networks analysis

As per the presentation of the evolution and quantitative overview of publications regarding behavior issues in project management, it is important to present the results from networks and their connections. Network analysis aims to understand the patterns of relationships among works published concerning behavior issues in project management. Network analysis can be applied to any empiric subject with special attention to the effects of centrality behavior of authors in the network, the origins of the relationship between individuals and organizations as well as their strategic behavior and objective (Mizruchi, 2006).

The 35 most cited articles were identified and presented in decreasing order in Appendix A at the end of this article. These articles represent 20.71% out of 169 publications in the sample. Out of 1951 citations in the entire sample, these most cited articles had 1398 citations or 71.65% of the total citations.

Based on this data, relationship networks and networks between articles and their references were elaborated in order to identify patterns of behavior and the inter-relationship among authors who approach behavior issues in project management.

The generation of the articles to references network was based on the 35 most cited articles of the sample and their references. This network is shown in Figure 1 and shows the relationship among these articles.

Analyzing Figure 1, it can be observed that Söderlund (2011) and Scott-Young & Samson (2009) are the authors with the highest number of references from co-cited articles. As regards Söderlund (2011), this article elaborates a literature review about project management for the last 50 years. Therefore, this article is expected to cite a large number of articles in the co-citation network.

Table 2. Distribution of number of articles of the sample by publication year and *journal*.

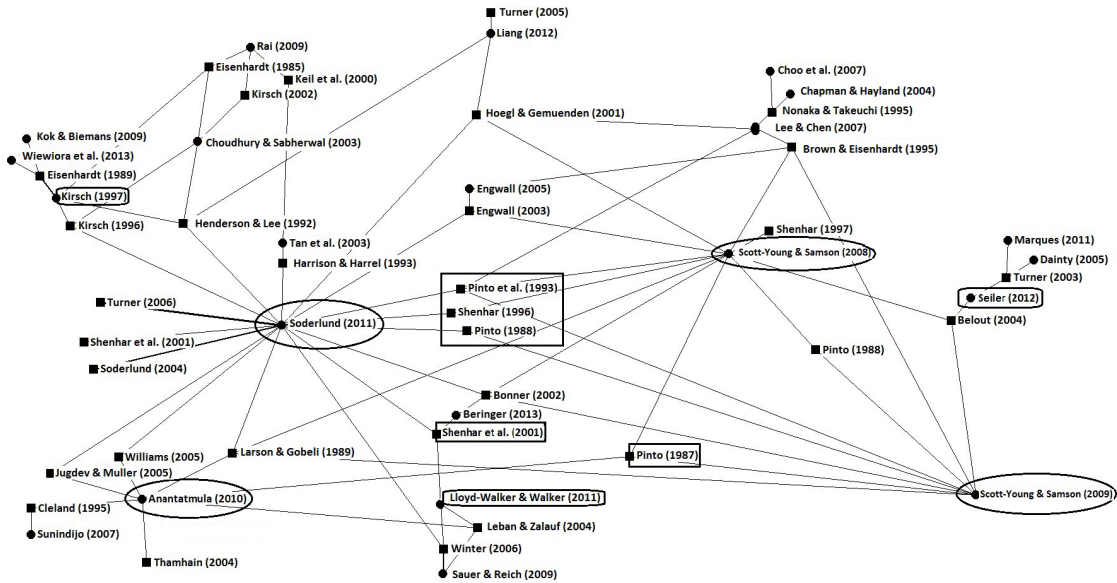| Journals	1988	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
International Journal Of Project Management																				6	3	6	6	5	5	**31**
Journal Of Construction Engineering And Management-Asce		1			2										1	5	2	2	5	4	1	2	2			**28**
Project Management Journal																		1	2	2	2	1	2	2	2	**14**
Journal Of Management In Engineering					1		1	1	1		1	2	2	1		1	2									**13**
Ieee Transactions On Engineering Management	1			3	1							1			2			1						1	1	**11**
Journal Of Professional Issues In Engineering Education And Practice												1	2		2			1								**6**
International Journal Of Technology Management										1	1	1			1						1					**5**
Mis Quarterly										1		1								2			1			**5**
Technovation																1		2		1	1					**5**
Emj-Engineering Management Journal																				1	1	2				**4**
European Journal Of Operational Research				2								1		1												**4**
International Journal Of Operations & Production Management																		1		2					1	**4**
Production And Operations Management																								1	3	**4**
Information Systems Research								1						1											1	**3**
International Journal Of Production Research																		2	1							**3**
Journal Of Operations Management																		1	1	1						**3**
Management Science		1	1															1								**3**
R & D Management									1						1	1										**3**
Industrial Management & Data Systems													1			1										**2**
International Journal Of Production Economics																								2		**2**
Journal Of Construction Engineering And Management																								1	1	**2**
Journal Of Product Innovation Management									1	1																**2**
Proceedings of IRNOP VII Project Research Conference																	2									**2**
African Journal Of Business Management																					1					**1**
International Journal Of Human Resource Management																								1		**1**
International Journal Of Management Reviews																						1				**1**
Journal Of Engineering And Technology Management													1													**1**
Journal Of Management Information Systems						1																				**1**
Omega-International Journal Of Management Science																								1		**1**
Project-Based Organizing And Strategic Management																						1				**1**
Research-Technology Management													1													**1**
Scandinavian Journal Of Management																							1			**1**
South African Journal Of Business Management																			1							**1**
Total	1	2	1	5	4	1	1	2	3	3	2	7	8	3	7	9	7	12	10	19	9	13	12	13	15	**169**

Figure 1. Network of relationships between articles of the sample and their references. Note: The circles refer to the articles of the sample whereas the squares are their references cited at least 4 times.

The article by Anantatmula (2010) is also a literature review which covers the development of project managers and how they influence the challenges proposed to their work team. The author affirms that the manager's role of leadership is of great importance for motivating individuals and for creating an effective work environment for the project team to meet greater challenges. Anantatmula (2010) considers that leadership is essential to a good evaluation of projects as well for influencing their critical success factors. This reasoning complements Müller & Turner (2006) as the author states that good leaders must assign adequate importance to relationships and communicate their values; at the same time, they must emphasize the importance of processes.

It is evident that Anantatmula (2010) corroborates Müller & Turner (2006) as well as emphasizes the leadership factor. While Müller & Turner (2006) shows the importance of relationships, Anantatmula (2010) adds that a good leader must have good relationships besides the influence on those being led so that the project can obtain the success desired. According to Lloyd-Walker & Walker (2011), such factors are hard to identify since they are associated with team expectations and with leadership. However, both authors agree with the role of leadership and its essentiality to project success.

Nevertheless, researches into project management give minor importance to how project teams influence three important factors: costs, schedule and operability (Scott-Young & Samson, 2008). In this sense, projects involving higher investments, multifunctional teams

and rigor in tracking schedules also face from this issue. For this reason, performance and the behavior of project team members are directly related (Lee & Chen, 2007), which proves the relation between these important nodes in the network. The articles by Lee & Chen (2007) and Scott-Young & Samson (2008) are complementary. While the first article shows how multidisciplinarity influences the behavior of teams and the positive evaluation of projects, Scott-Young & Samson (2008) assess project success and the influence that project teams, leadership, processes and the results have on project success.

Seiler et al. (2012) assess motivational factors in project management and complement that interpersonal interaction, delivery of duties, general conditions of work, entrepreneurship, personal development and bonuses are also important in work teams since it demands while encouraging.

Pinto & Slevin (1988), Pinto et al. (1993) and Shenhar & Dvir (1996) are authors whose articles are cited in one of the main clusters in the network. For this reason, they are references and have significant relevance to the subject. Besides, Pinto & Slevin (1987) also connect the work by Anantatmula (2010) with Scott-Young & Samson (2008, 2009). For this reason, as regards the articles in the co-citation network shown in the articles to references network, there is dispersion and a great inter-relation with the articles in the database.

Pinto (2014) assesses the organizational behavior of companies by associating it to the productivity throughout the project. Therefore, this relates directly to the impacts generated in project results and with the

project management itself. Lloyd-Walker & Walker (2011) remark the importance of different attributes, knowledge and competencies of project managers and define leadership as a key factor to results. The authors affirm that authentic leadership can be seen as an extension of transformational leadership.

Lee & Chen (2007) point out that the effects of attitudes and behaviors of employees in new product development are stronger than the effects of functional diversity. This indicates that senior managers and team leaders should manage communication effectively in order to recognize and to reconcile different perspectives. In addition, they must understand one another so that a commitment sense and cooperative behavior aiming a better group evaluation can be generated.

Co-citation network analysis aims to identify the references most cited by the articles in the sample. This network contributes with the identification of theoretical pillars within the behavioral issues in project management. In order to generate co-citation networks, references cited at least four times by the articles in the sample were considered. The co-citation network is presented in Figure 2.

Centrality and betweenness degrees were generated for the co-citation network. Centrality degree deals with the total number of authors of a network that published jointly with another author (Bordin et al., 2014). An author with a high centrality degree demonstrates a significant number of direct or indirect partnerships in the network analyzed. For Leem & Chun (2014), the centrality degree of an article suggests that the more connections a node has, the more central this

article is or, in other words, centrality is defined as the number of interactions a node has with others (Ting & Tsang, 2013). Betweenness degree is the degree of an article as enabler of the intermediation between other articles (Lopes & Carvalho, 2012). According to Bordin et al. (2014), betweenness degree is understood as how connected an author is with other authors in the network attributing the importance an author has when the information flux that goes through it is considered, in the interconnection between two other authors in the same network, always characterizing the shortest path possible.

The normalization of both centrality and betweenness degrees shows how the average number of co-citations divided by the average of the average of co-citations takes a position inside a pre-defined universe considering the standardization of the behavior of co-citations of an individual by relating the impact of its co-citations in relation to the frequency of co-citation expected, supposing a global tendency observed in the group (Oliveira & Grácio, 2012).

Centrality and betweenness degrees are shown in Table 3 where the centrality of Hoegl & Gemuenden (2001) and the betweenness of Larson & Gobeli (1989) are highlighted. Therefore, it can be concluded that the article by Hoegl & Gemuenden (2001) has the highest number of partnerships within the network while Larson & Gobeli (1989) have a high information flow being the shortest path when the interconnection between different authors within the network is considered.

The article by Hoegl & Gemuenden (2001) shows the importance of team work to innovative
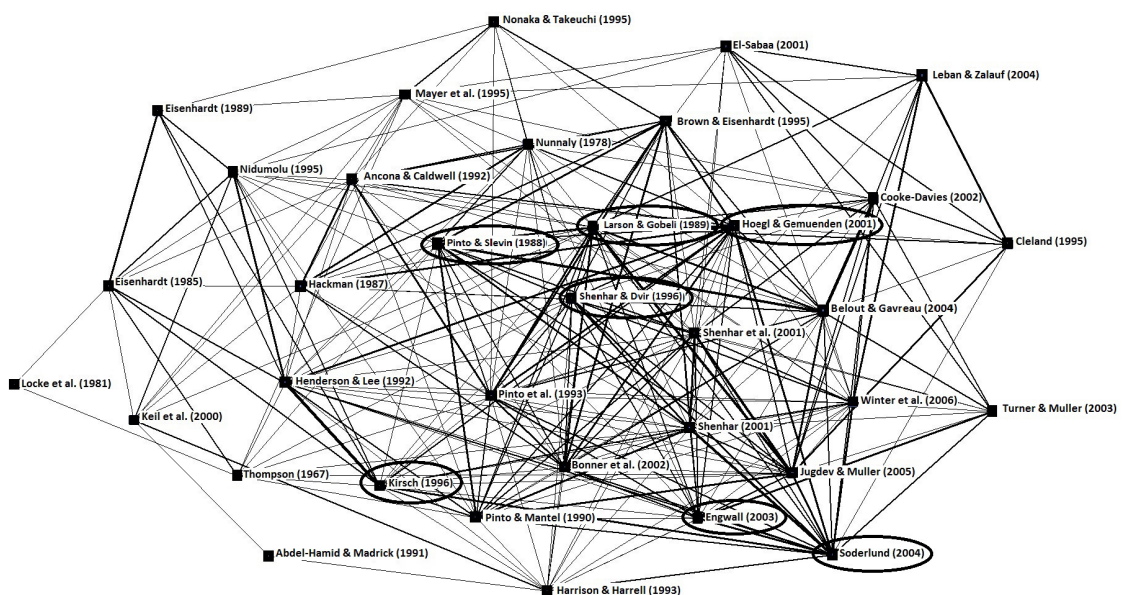

Figura 2. Co-citation network. The squares represent the references of the articles of the sample that were cited jointly at least four times.

Table 3. Centrality and Betweenness degrees for the co-citation network.

Authors	Centrality Degree	Normalized Centrality Degree	Authors	Betweenness Degree	Normalized Betweenness Degree
Hoegl & Gemuenden (2001)	46,000	26,286	Larson & Gobeli (1989)	27,998	4,706
Larson & Gobeli (1989)	43,000	24,571	Harrison & Harrell (1993)	26,393	4,436
Söderlund (2004)	43,000	24,571	Mayer et al. (1995)	25,528	4,291
Jugdev & Muller (2005)	42,000	24,000	Thompson (1967)	22,209	3,733
Shenhar & Dvir (1996)	39,000	22,286	Henderson & Lee (1992)	20,103	3,379
Pinto & Slevin (1988)	38,000	21,714	Shenhar et al. (2001)	17,818	2,995
Pinto et al. (1993)	37,000	21,143	Hoegl & Gemuenden (2001)	17,401	2,924
Belout & Gauvreau (2004)	37,000	21,143	Shenhar & Dvir (1996)	16,674	2,802
Shenhar (2001)	36,000	20,571	Eisenhardt (1985)	15,895	2,671
Bonner et al. (2002)	35,000	20,000	Jugdev & Muller (2005)	15,138	2,544
Shenhar et al. (2001)	35,000	20,000	Kirsch (1996)	15,125	2,542
Henderson & Lee (1992)	34,000	19,429	Shenhar (2001)	13,843	2,325
Pinto & Mantel (1990)	33,000	18,857	Keil et al. (2000)	11,482	1,930
Engwall (2003)	32,000	18,286	Ancona & Caldwell (1988)	11,422	1,920
Kirsch (1996)	31,000	17,714	Crawford et al. (2006)	11,370	1,911
Brown & Eisenhardt (1995)	29,000	16,571	Nidumolu (1995)	10,742	1,805
Crawford et al. (2006)	28,000	16,000	Hackman (1987)	10,065	1,692
Cooke-Davies (2002)	28,000	16,000	Belout & Gauvreau (2004)	8,928	1,501
Hackman (1987)	24,000	13,714	Pinto et al. (1993)	7,969	1,339
Ancona & Caldwell (1988)	23,000	13,143	Pinto & Slevin (1988)	7,908	1,329
Nunnally (1978)	20,000	11,429	Cooke-Davies (2002)	7,544	1,268
Nidumolu (1995)	20,000	11,429	Engwall (2003)	5,752	0.967
Harrison & Harrell (1993)	18,000	10,286	Pinto & Mantel (1990)	5,608	0.942
Eisenhardt (1985)	16,000	9,143	Söderlund (2004)	5,568	0.936
Leban & Zulauf (2004)	16,000	9,143	Nunnally (1978)	4,452	0.748
Turner & Müller (2003)	16,000	9,143	Bonner et al. (2002)	4,372	0.735
Cleland (1995)	15,000	8,571	El-Sabaa (2001)	4,136	0.695
Mayer et al. (1995)	15,000	8,571	Nonaka & Takeuchi (1995)	3,410	0.573
El-Sabaa (2001)	14,000	8,000	Brown & Eisenhardt (1995)	2,306	0.387
Thompson (1967)	12,000	6,857	Eisenhardt (1989)	1,478	0.248
Eisenhardt (1989)	11,000	6,286	Leban & Zulauf (2004)	1,226	0.206
Nonaka & Takeuchi (1995)	10,000	5,714	Cleland (1995)	1,188	0.200
Keil et al. (2000)	10,000	5,714	Turner & Müller (2003)	0.959	0.161
Abdel-Hamid & Madnick (1989)	2,000	1,143	Abdel-Hamid & Madnick (1989)	0.000	0.000
Locke et al. (1981)	2,000	1,143	Locke et al. (1981)	0.000	0.000

project success besides making a strong association with personal and team members successes, that is, work satisfaction associated to learning. The authors consider six factors: communication, coordination, balance and contribution of members, mutual support, effort and cohesion. Note that this node has a high centrality degree within the network meaning that it has a high degree of connections with other articles. A proof of that is the connection with Shenhar & Dvir (1996) who define different project management styles, management and leadership variables that are critical to project success. Nevertheless, there is a direction to project management in new product development without ruling out the importance of soft styles in project management. Pinto & Slevin (1988) highlight how to determine critical success factors in project management and the influence of project managers in this determination. The authors stress that managers dedicated full time to projects had better results in their experiences in which the critical success factors were generated for the success of the project.

In the extreme bottom of Figure 2, there are the authors who address models for project management. Engwall et al. (2005) state that product development occurs more efficiently when specific models of project

management are used. Kirsch (1996) affirms that an individual or a group in an organization can ensure that others can work to reach a set of organizational goals. The author emphasizes four modes of control in management: behavioral, evolving, by teams and individual. Söderlund (2004) discusses the emerging perspectives within the project field in which the author highlights that great efforts have been put to clarify reasons for success and failure while other important factors are minimized, raising a variety of questions that must be addressed in order to promote knowledge about project management. In sum, all of them examine project management from the control of established functions.

The article by Larson & Gobeli (1989) has the highest betweenness degree among the possible peers in the co-citation network. For this reason, it is centralized in the network in Figure 2 with a high number of connections.

The last network analysis encompasses the occurrence of keywords in the articles of the sample. The criterion for cut-off was to consider the keyword networks of the articles of the sample cited at least four times. Keywords with generic meaning as well as words used during the search in the *ISI Web of Science* and *Scopus* were excluded from the network. Hence, the keywords excluded from the network were: "*Project Management*", "*Management*" and "*Work*". An item in the network had a null meaning since it represented no keywords and, therefore, *NO KW2* was excluded. The keyword network is shown in Figure 3. The clusters encompassing different subjects are verified to have relations with the subject of behavioral issues in project management.

Among the keyword network in Figure 3, the clusters per subject were identified and are shown as follows:

- **Types of Project:** this cluster presents the types of project in which behavioral issues in project management were highly addressed.

- **Behavioral and personal issues:** this cluster refers to the issues addressed within the subject of behavioral issues, such as trust, commitment and leadership.
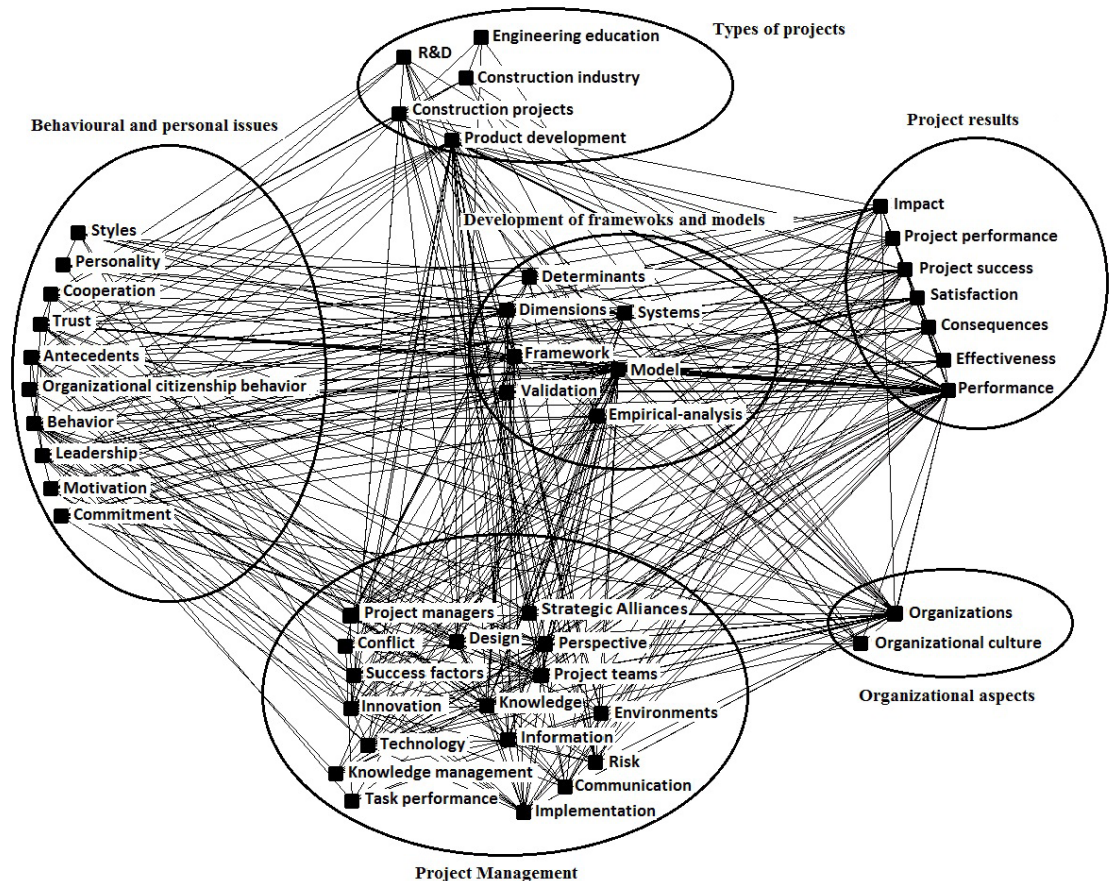

Figure 3. Keywords network. The squares represent the keywords identified in the articles of the sample and that were cited jointly at least four times. They were grouped according to the theme.

- **Development of frameworks and models:** this cluster is related to the terms that indicate the creation of models, methods and frameworks for empirical application.

- **Project Management:** this cluster evidences the relationship of terms that indicate the project management field of research.

- **Organizational aspects:** this cluster incorporates the relationship of words related to organizational culture and its relation with other terms within behavioral issues in project management.

- **Project results:** this cluster encompasses the relationship of terms connected to the final process of project management.

Behavioral issues in project management are essential for assessing success in projects since the role of leadership influences the behavior of teams and, consequently, project evaluation, with a special focus on multidisciplinary teams necessary for innovative projects. This corroborates the work by Scott-Young & Samson (2009) that demonstrates through case studies that, with the use of integrated multifunctional teams, a stable leadership and bonus to project managers contribute to the pace in project execution and influences the performance of team members. Besides, the experience of project managers and their low turnover rate is also an influence on the final result of projects.

The keyword "performance" has strong connections with a diverse range of components of the keyword network in Figure 3, showing relations with all the clusters developed. This keyword is observed to appear at the top of Table 4 with the highest centrality and betweenness degrees and is a term that deserves mention due to its high number of peers within the network, as well as for being the shortest path when dealing with the interconnections of peers. Considering the subject of behavioral issues in project management, this keyword is possibly an indication of behavioral issues as an essential factor to performance and project success.

Lloyd-Walker & Walker (2011) state that greater communication is necessary for project leadership generating a better relationship between team members since this relationship has become one of the most important behavioral issues in project management. Desired work environment is one in which team members communicate openly and honestly within an ethical framework that can be modified by the members. The authors emphasize that the main needs of a leader are the values, which means adding values to work, to the good work environment, to commitment, to trust and to integrity.

The relation between performance, outlined in the keyword network along with keywords in the behavioral issues segment in the network, is presented in Table 4 in which the words "*behavior*", "*trust*", "*leadership*", "*cooperation*", "*organizational citizenship behavior*", "*motivation*" and "*commitment*" are highlighted.

Table 4. Centrality and Betweenness Degrees for the keyword network.

Keywords	Centrality Degree	Normalized Centrality Degree	Keywords	Betweenness Degree	Normalized Betweenness Degree
PERFORMANCE	167,00	17,234	PERFORMANCE	228,866	14,340
MODEL	132,000	13,622	MODEL	214,660	13,450
PRODUCT DEVELOPMENT	54,000	5,573	PRODUCT DEVELOPMENT	45,657	2,861
KNOWLEDGE	48,000	4,954	PERSPECTIVE	41,166	2,579
INNOVATION	43,000	4,438	ORGANIZATIONS	41,047	2,572
BEHAVIOR	41,000	4,231	KNOWLEDGE	38,896	2,437
PERSPECTIVE	39,000	4,025	DESIGN	38,390	2,405
TRUST	37,000	3,818	BEHAVIOR	36,628	2,295
ORGANIZATIONS	32,000	3,302	INNOVATION	19,158	1,827
FRAMEWORK	32,000	3,302	DIMENSIONS	25,411	1,592
DESIGN	31,000	3,199	FRAMEWORK	22,191	1,390
IMPLEMENTATION	29,000	2,993	PROJECT SUCCESS	17,236	1,080
ANTECEDENTS	27,000	2,786	SYSTEMS	14,573	0.913
TECHNOLOGY	27,000	2,786	LEADERSHIP	13,839	0.867
PROJECT SUCCESS	27,000	2,786	TRUST	12,485	0.782
DIMENSIONS	26,000	2,683	IMPLEMENTATION	12,368	0.775
LEADERSHIP	26,000	2,683	IMPACT	11,803	0.740

Table 4. Continuação...

Keywords	Centrality Degree	Normalized Centrality Degree	Keywords	Betweenness Degree	Normalized Betweenness Degree
COOPERATION	26,000	2,683	INFORMATION	9,590	0.601
SATISFACTION	23,000	2,374	RISK	8,371	0.525
RISK	22,000	2,270	ANTECEDENTS	8,072	0.506
INFORMATION	21,000	2,167	SATISFACTION	7,981	0.500
ORGANIZATIONAL CITIZENSHIP BEHAVIOR	20,000	21,064	CONSTRUCTION PROJECTS	6,962	0.436
VALIDATION	20,000	21,064	PROJECT SUCCESS	6,545	0.410
IMPACT	20,000	21,064	SUCCESS FACTORS	6,420	0.402
PROJECT SUCCESS	19,000	1,961	TECHNOLOGY	6,239	0.391
SYSTEMS	19,000	1,961	COOPERATION	5,678	0.356
SUCCESS FACTORS	18,000	1,858	CONSTRUCTION PROJECTS	5,541	0.347
PROJECT TEAMS	18,000	1,858	PROJECT MANAGERS	5,330	0.334
COMMUNICATION	17,000	1,754	CONSTRUCTION INDUSTRY	4,872	0.305
PROJECT MANAGERS	17,000	1,754	COMMUNICATION	4,867	0.305
STRATEGIC ALLIANCES	16,000	1,651	STRATEGIC ALLIANCES	4,418	0.277
EMPIRICAL ANALYSIS	16,000	1,651	R&D	4,132	0.259
CONSEQUENCES	15,000	1,548	ORGANIZATIONAL CITIZENSHIP BEHAVIOR	4,101	0.257
MOTIVATION	15,000	1,548	ORGANIZATIONAL CULTURE	4,048	0.254
KNOWLEDGE MANAGEMENT	15,000	1,548	ENVIRONMENTS	3,800	0.238
PROJECT MANAGERS	14,000	1,445	MOTIVATION	3,704	0.232
ORGANIZATIONS	14,000	1,445	ORGANIZATIONS	3,676	0.230
EFFECTIVENESS	14,000	1,445	PROJECT MANAGERS	3,444	0.216
R&D	14,000	1,445	CONSEQUENCES	3,247	0.203
ENVIRONMENTS	13,000	1,342	VALIDATION	3,126	0.196
PROJECT PERFORMANCE	13,000	1,342	PROJECT TEAMS	2,937	0.184
COMMITMENT	12,000	1,238	EMPIRICAL ANALYSIS	2,907	0.182
CONFLICT	11,000	1,135	CONFLICT	2,635	0.165
ORGANIZATIONAL CULTURE	11,000	1,135	PROJECT PERFORMANCE	2,569	0.161
PROJECT TEAMS	11,000	1,135	EFFECETIVENESS	2,053	0.129
CONSTRUCTION PROJECTS	10,000	1,032	PROJECT TEAMS	1,855	0.116
STYLES	9,000	0.929	COMMITMENT	1,502	0.094
CONSTRUCTION PROJECTS	9,000	0.929	DETERMINANTS	1,476	0.092
DETERMINANTS	9,000	0.929	STYLES	1,443	0.090
CONSTRUCTION INDUSTRY	8,000	0.826	KNOWLEDGE MANAGEMENT	1,295	0.081
PERSONALITY	7,000	0.722	PERSONALITY	0.708	0.044
TASK PERFORMANCE	6,000	0.619	ENGINEERING EDUCATION	0.593	0.037
ENGINEERING EDUCATION	4,000	0.413	TASK PERFORMANCE	0.492	0.031

Culture of a specific region also influences the leadership behavior and organizational culture since different relations direct perceptions and preferences of diverse leadership styles. Moreover, project quality also depends on project team performance where efficient leadership is necessary since it enables an efficient team management. Various case studies highlight the relation between project management and behavioral and personal issues in order to attain better results in projects which, in other words, makes evident that these aspects does not bring excellent results singly (Kasapoğlu, 2014).

Other authors also relate behavioral issues with performance. They consider that leadership is essential to a good team performance strengthening the bonds of trust and cooperation among team members (Anantatmula, 2010; Kissi et al., 2013; Müller & Turner, 2006), treat cultural differences in the work environment as an influence to the individual and organizational behavior as well as in the relationships

between individuals (Beringer et al., 2013; Lee & Chen, 2007; Mizruchi, 2006; Pinto, 2014; Wiewiora et al., 2013); assess the importance of multidisciplinary and team work accentuating commitment and motivation (Hoegl & Gemuenden, 2001; Norrgren & Schaller, 1999; Seiler et al., 2012).

4 Discussion

The term "soft", presented by Crawford & Pollack (2004) defines that valuation of relationships, hereby defined as behavioral issues, must be measured qualitatively since it characterizes the human side of interpersonal relations in project management.

Based on graphs and tables presented in this study, it is possible to verify that the peak of publications was in 2009 when compared to previous years as this year had a higher number of publications related to the subject as well as 11.2% in relation to all publications. It is relevant that 2014 had 8.9% out of all publications and being the second highest peak since this subject has been addressed within the field of interest in 1988.

In the analysis of journals, the highest number of publications are in *International Journal of Project Management* with 18.3% of all publications as the *Journal of Construction Engineering and Management – ASCE* is in second place with 16.6%, followed by *Project Management Journal* with 8.3%. In fourth, the *Journal of Management in Engineering* represents 7.7% and in fifth, the *IEEE Transactionson Engeneering Management* with 6.5%. Based on that, the theme of behavioral issues represents an important role to be developed by these journals since it can be inferred that behavioral issues in project management has taken its path so that the research agenda in project management can spread knowledge about this theme.

Out of all 1951 citations, 14 publications represent 50.4% of citations. The journal *Management Science* represents 249 citations and 25.3% when considered on the 14 highly cited and 12.8% when all are considered. The journal *Information Systems Research* with 269 citations represent 27.4% and 13.8% respectively.

The networks have an important function to visualize the relationships between authors and their works, their references, cocitation relations among references and the inter-relation among keywords. It is important to note that, along with the presentation of networks, a deeper analysis was done jointly and previously with the presentation of each social network.

Furthermore, in regards to the appendix of this work, it incorporates de 35 most cited articles of the sample and, hence, it is relevant to map the subject of the first five of them. The first is the article by Henderson & Lee (1992) which explores the centrality of control relationships between project management and the members during the work of information systems

design teams. In this way, Henderson & Lee (1992) explores control behaviors affecting team performance which is also similar to Engwall et al. (2005), Kirsch (1996) and Söderlund (2004). The second article is by Kirsch (1997) that addresses systems development management in the light of control function since this function aims to ensure that individuals act consistently in order to attain strategic objectives and results to the organization. The article by Choudhury & Sabherwal (2003) examines the evolution of control portfolios through the duration of outsourced information systems development projects. Barki & Hartwick (2001) aim to test a model to assess how members of information systems development perceive interpersonal conflict. In this way, the authors aim to relate interpersonal conflict, conflict management and the results of development projects. Lastly, Boutellier et al. (1998) present a discussion about the application of project management methods and the use of technology as a way to reduce the disadvantages of using research and development teams dispersed globally.

For the keyword network, it is evident the density of relationships among terms and among clusters. Essentially, behavioral issues in project management is a subject marked by the subjectivity of more complex and unpredictable elements as well as the difficulty in their measurement when compared to other more objective criteria of project management. However, the cluster for models and frameworks infers that there is a tendency of developing tools for a more precise analysis in order to contribute to the development of projects. By verifying the centrality and betweenness degrees, it is important to note that a third term with the highest degree – after performance and model – is product development. Product development incorporates all activities necessary to deliver a product to market and it is an area where there is a great dependency of multifunctional teamwork that integrates dispersed knowledge in an environment with recurring interaction where effective leadership is an important factor to project progress. In this way, product development area is a fertile ground to behavioral issues approach as it is evident the relations between the product development cluster and the behavioral and personal issues clusters with project success.

This is substantiated in the work by Kasapoğlu (2014) that appoints to the importance of behavioral issues and different styles of leadership. The author stresses that the democratic style is recognized as the one that allows subordinates to show their ideas and take part in decision-making processes. Being participative is a form to support workers by allowing them to participate in project and decision-making processes in order to contribute to their personal development and enhance their performance. This interaction increases quality and reduces the error rate in projects. Kasapoğlu (2014) affirms that,

although certain behaviors are preferred in relation to others, organizations may have all styles of leadership and the importance of behavior is what motivates workers which make preferences for leadership a contextual determination of the leader that makes a broad evaluation of the work performed.

Analogously, Anantatmula (2010) ensures that diverse factors impact project management among which clear communication with management, the establishment of bonds of trust and result management are highlighted. The author considers that a solid communication practice would collaborate with the project manager to communicate in accordance to expectations from the beginning of a project. However, if the project manager does not communicate clearly, it is unlikely he will be able to achieve the expected results. Transparency in communication can act as facilitator or a barrier. Other authors corroborate this assumptions such as Lloyd-Walker & Walker (2011) and Pinto & Slevin (1987).

Norrgren & Schaller (1999) relates leadership styles, work environment and learning strategies in work group with organizational environment and trust where emotional involvement and work relations are essential in the development of new ideas. According to Figure 3, organizational environment and trust personified in the leaders have strong relation to performance.

In four case studies, Kirsch (1997) emphasizes how behavior influences during the phases of a project such as task execution, project knowledge and the development of skills, results achieved, expectations and skills of the project leader as well as the bonds of trust among team members.

These authors show the direct relation between behavioral issues and different characteristics that are essential in project managers emphasizing the relations presented in Table 4. Broadly speaking, project management cannot be untied from organizational aspects. Since project management is an organizational concept (Shenhar & Dvir, 1996), these aspects are broadly presented in keywords network under the terms "organizations" and "organizational culture". It is relevant to draw a parallel between organizational aspects and behavioral issues that may have arisen in the five articles with the highest centrality degrees in the cocitation network. The importance is that this network shows the theoretical and conceptual pillars most utilized by the articles in the sample. Conceptual works with empirical application (Hoegl & Gemuenden, 2001), *survey* with multivariate analysis about project management structure and success in development projects (Larson & Gobeli, 1989), literature and research review about projects along with the construction of a classification model (Söderlund, 2004), literature review and evolution of the concept of success in projects (Jugdev & Muller,

2005) and creation of typologies to classify modes of project management (Shenhar & Dvir, 1996) are themes addressed in the five articles with highest centrality degrees in this network.

Hoegl & Gemuenden (2001), though the construction of the concept of TeamWork Quality, are based on constructs such as communication, coordination, balance of member contributions, mutual support, effort and cohesion. The empirical application of this concept extracts certain results that present the interlocution between behavioral issues and organizational aspects. Hoegl & Gemuenden (2001) stress that the assessment of team performance is different in the perspective of team members, project leaders and managers. However, this difference in assessment is linked to questions from the organizational level such as vertical and horizontal differences as well as aspects related to career development and bonus that invariably influence on how results are perceived.

Larson & Gobeli (1989) and Shenhar & Dvir (1996) emphasize questions related to types of project management structure and organizational aspects and less emphasis on behavioral aspects. While Shenhar & Dvir (1996) discuss theoretical questions suggesting taxonomies for projects and management types, Larson & Gobeli (1989) address the significance of three management structures for the success in development projects. The management structures addressed by Larson & Gobeli (1989) incorporates behavioral issues in the influence project managers and functional managers have as well as utilize five variables of analysis such as project complexity, novelty of technology, clarity of project objectives, project priority and sufficient resources. Results appointed by Larson & Gobeli (1989) show that success in development project varies according to the project structure selected as the variable of clarity of objectives is the strongest with project success. However, the authors stress that the choice of project structure is a contingent decision where there must be the consideration of project nature and the requirements of the organization.

Shenhar & Dvir (1996) develop a two-dimension model – technological uncertainty and system scope – to classify projects and their characteristics and suggest that projects have variations between them and, consequently, management must be different for each. Therefore, Shenhar & Dvir (1996) suggest that a clear definition of the type of project at the outset must be the basis for selecting the type of management. Such clarity in this definition contributes to project success and organizational effectiveness whereas it contributes so that members of organizations can have management capabilities in a diverse range of projects.

The articles by Söderlund (2004) and by Jugdev & Muller (2005) are both literature reviews. Söderlund

(2004) addresses a literature review of project-related research published in major management and organizational journals as well as in the *International Journal of Project Management* between 1993 and 2002. The author proposes the term "project research" as a better way of capturing the current state of the field instead of a focus on project management. The author develops a framework to classify the project research in project management, inter-firm projects, multi-project firms and project ecologies. However, Söderlund (2004) stresses that a great effort has been applied in order to expand the interpretations of project management within organizational theory as this research leans towards behavioral dimensions of projects and is less interested in activities of planning or critical success factors.

The article by Jugdev & Muller (2005), through an analysis of the last 40 years about the evolution of the concept of success in projects, stresses that projects refer to management of expectations and are related to perceptions of success. Jugdev & Muller (2005) points out that success in projects is an ambiguous and interchangeable concept throughout the project. For this reason, behavioral issues as effective communication with stakeholders and with project supporters are essential for project success. This differentiated perception of project success is in line with the difference also observed by Hoegl & Gemuenden (2001).

In light of this, behavioral issues, including interaction and communication with individuals, constitute the most relevant difficulties with respect to technical and planning aspects of projects. Organizational environment have specific and variable circumstances which influences directly behavioral issues. Leadership needs to achieve an appropriate level of team work, communication and performance for success in project management.

5 Conclusions

The aim was to analyze the literature on behavioral issues in project management as from a bibliometric approach. At the same time, it sought to identify the main elements as aspects that are around this theme. The descriptive analysis of publications meant to elaborate an overview of the development of the theme throughout the years. The networks aimed to identify the most relevant theoretical pillars and the main themes relevant to behavioral issues in project management.

In the research on project management, it is evident that the terms "hard" and "soft" represent two opposite nodes in a continuum. Behavioral issues lean towards the "soft" side of project management in which relationships, cultures and meanings are valued, i.e., elements that correspond to the "human side" of project management (Liu et al., 2011). Within

this theme, leadership and the role of the leader are relevant for achieving results in projects. The leader has an essential role in relations, communication and team work.

Keywords network shows that, within the "types of project" cluster, those interrelated appear with higher predominance since product development has the third highest centrality degree. Product development projects depend on multifunctional team work by incorporating dispersed knowledge and constant interactions. For this reason, this sort of project evidences the need of assertive leadership and the role of leaders as essential in the conduction of teams throughout the project.

In regards to the identified themes, there is a concern with performance, success and project results in which leadership aspects are essential to achieve these results. Performance hence arises as the keyword with the highest centrality degree of the network. However, it is suggested that project success is also variable depending on the evaluation of different team members that are influenced by organizational aspects and human resources. Teams play an important role in planning and executing projects, developing behaviors and contributing to skills that match the type of project involved. However, Scott-Young & Samson (2008) stress that research on project management gives minor importance to how a project team influences three important factors such as cost, schedule and operability. In light of this, results achieved in this study can be expanded in future works about the relation between performance and the behavior of team members and the project (Lee & Chen, 2007).

As project management is an organizational concept (Shenhar & Dvir, 1996), the organizational theory is more concerned with behavioral aspects of project management than with types of management (Söderlund, 2004). However, the main articles representing the theoretical pillars of the articles in the sample lean towards project management structures, creation of taxonomies for classifying projects and their management styles, the relation between management structure and project success or literature reviews in which behavioral issues in project management are not addressed with relevance. Future research can learn from the need of incorporating behavioral issues more assertively into project management structures and how these structures can collaborate with the development of high performance teams and members to achieve project success.

However, this work has limitations. The results cannot be generalized since the final sample was generated using publications identified in the *ISI Web of Science* database even though the publication search was also executed using the *Scopus* database. This limitation is a result of using the software *Sitkis* to generate the

files for the networks since it reads only files from the *ISI Web of Science* database. The identification of articles relevant to the theme, responsible for the final study, was made by reading the abstracts of each article and, in certain cases, the abstract does not reflect the true content of the entire article. The absence of words such as quality of life, creativity and entrepreneurship reflect that behavioral aspects are treated as instruments for project performance and client satisfaction, but not as a form to generate an alternative and more creative solution to problems, therefore, massifying project management structures.

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Appendix A. 35 most cited articles.

Authors	Article	Journal	Citations	% individual	% accumulated
Henderson & Lee (1992)	*Managing I/S design teams - a control theories perspective*	*Management Science*	175	8.97	8.97
Kirsch (1997)	*Portfolios of Control modes and IS project management*	*Information Systems Research*	136	6.97	15.94
Choudhury & Sabherwal (2003)	*Portfolios of control in outsourced software development projects*	*Information Systems Research*	133	6.82	22.7
Barki & Hartwick (2001)	*Interpersonal conflict and its management in information system development*	*Mis Quartely*	103	5.28	28.04
Boutellier et al. (1998)	*Management of dispersed product development teams: the role of information technologies*	*R&D Management*	75	3.84	31.88
Markham (1998)	*A longitudinal examination of how champions influence others to support their projects*	*Journal of Product Innovation Management*	60	3.08	34.96
Tan et al. (2003)	*Reporting bad news about software projects: Impact of organizational climate and information asymmetry in an individualistic and a collectivistic culture*	*IEEE Transactions on Engineering Management*	46	2.36	37.31
Rai et al. (2009)	*Offshore Information Systems Project Success: The Role of Social Embeddedness and Cultural Characteristics*	*Mis Quartely*	45	2.31	39.62
Choo et al. (2007)	*Method and psychological effects on learning behaviors and knowledge creation in quality improvement projects*	*Management Science*	43	2.20	41.82
Bendoly & Swink (2007)	*Moderating effects of information access on project management behavior, performance and perceptions*	*Journal of Operations Management*	36	1.85	43.67
Von Zedtwitz (2002)	*Organizational learning through post-project reviews in R&D*	*R&D Management*	34	1.74	45.41
Abdel-Hamid et al. (1999)	*The impact of goals on software project management: An experimental investigation*	*Mis Quartely*	33	1.69	47.10

Appendix A. Continued...

Authors	Article	Journal	Citations	% individual	% accumulated
Baccarini et al. (2004)	*Management of risks in information technology projects*	*Industrial Management & Data Systems*	33	1.69	48.80
Gutierrez & Kouvelis (1991)	*Parkinson Law and its Implications for Project - Management*	*Management Science*	31	1.59	50.38
Scott-Young & Samson (2008)	*Project Success and Project Team Management: Evidence from Capital Projects in the Process Industries*	*JournalofOperations Management*	29	1.49	51.87
Chapman & Hyland (2004)	*Complexity and Learning Behaviors in Product Innovation*	*Technovation*	27	1.38	53.25
Gomar et al. (2002)	*Assignment and Allocation Optimization of Partially Multiskilled Workforce*	*Journal of Construction Engineering and Management - ASCE*	25	1.28	54.54
Norrgren & Schaller (1999)	*Leadership Style: Its Impact on Cross-Functional Product Development*	*Journal of Product Innovation Management*	25	1.28	55.82
Fong & Chu (2006)	*Exploratory Study of Knowledge Sharing in Contracting Companies: A Sociotechnical Perspective*	*Journal of Construction Engineering and Management*	22	1.13	56.95
Larichev (2001)	*Ranking Multicriteria Alternatives: The method ZAPROS III*	*European Journal of Operational Research*	22	1.13	58.07
Söderlund (2011)	*Pluralism in Project Management: Navigating the Crossroads of Specialization and Fragmentation*	*International Journal of Management Reviews*	21	1.08	59.15
Han et al. (2005)	*Contractor's risk Attitudes in the Selection of International Construction Projects*	*Journal of Construction Engineering and Management - ASCE*	21	1.08	60.23
Hanna et al. (2005)	*Impact of Extended Overtime on Construction Labor Productivity*	*Journal of Construction Engineering and Management - ASCE*	20	1.03	61.25
Anantatmula (2008)	*The Role of Technology in the Project Manager Performance Model*	*Project Management Journal*	18	0.92	62.17
Lee & Chen (2007)	*Cross-functionality and Charged Behavior of the new Product Development Teams in Taiwan's Information Technology Industries*	*Technovation*	18	0.92	63.10
De Korvin et al. (2002)	*Utilizing Fuzzy Compatibility of Skill Sets for Team Selection in Multi-Phase Projects*	*Journal of Engineering and Technology Management*	18	0.92	64.02

Appendix A. Continued...

Authors	Article	Journal	Citations	% individual	% accumulated
Pinto (2002)	*Project Management 2002*	*Research Technology Management*	18	0.92	64.94
Fong & Kwok (2009)	*Organizational Culture and Knowledge Management Success at Project and Organizational Levels in Contracting Firms*	*Journal of Construction Engineering and Management - ASCE*	17	0.87	65.81
Kok & Biemans (2009)	*Creating a Market-Oriented Product Innovation Process: A Contingency Approach*	*Technovation*	17	0.87	66.68
Shim & Lee (2001)	*Upward Influence Styles of R&D Project Leaders*	*IEEE Transactions on Engineering Management*	17	0.87	67.56
Albanese (1994)	*Team-Building Process - Key to Better Project Results*	*Journal of Management in Engineering*	17	0.87	68.43
Love et al. (2011)	*Risk/Reward Compensation Model for Civil Engineering Infrastructure Alliance Projects*	*Journal of Construction Engineering and Management – ASCE*	16	0.82	69.25
Akgün et al. (2007)	*Team Stressors, Management Support, and Project and Process Outcomes in New Product Development Projects*	*Technovation*	16	0.82	70.07
Fong & Lung (2007)	*Interorganizational Teamwork in the Construction Industry*	*Journal of Construction Engineering and Management - ASCE*	16	0.82	70.89
Sauer & Reich (2009)	*Rethinking IT Project Management: Evidence of a New Mindset and its Implications*	*International Journal of Project Management*	15	0.77	71.66