IT OUTSOURCING MANAGEMENT: THE STATE OF THE ART RECOGNITION BY A CONSTRUCTIVIST RESEARCH PROCESS AND BIBLIOMETRICS

GESTÃO DA TERCEIRIZAÇÃO DE TI: IDENTIFICAÇÃO DO ESTADO DA ARTE POR MEIO DE UM PROCESSO CONSTRUTIVISTA DE INVESTIGAÇÃO E ANÁLISE BIBLIOMÉTRICA

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ABSTRACT

The objective of this paper is to improve the knowledge of researchers on the subject of Information Technology Outsourcing (ITO) Management, identifying their most relevant articles and their issues by the use of a constructivist process - Knowledge Development Process - Constructivist (ProKnow-C). For this purpose, publications were identified in the literature, aligned with the subject, resulting in a Bibliographic Portfolio with 23 articles. Using the Bibliographic Portfolio, it was shown that: i) the most present journal was The Journal of Strategic Information Systems; ii) the most cited article was Poppo, L. & Zenger, T. (2002); iii) the most present author was the J. Goo; iv) the most cited authors in general were L. P. Willcocks and M. C. Lacity; v) the most present keywords in the portfolio was "Outsourcing".

Keywords: Outsourcing; Information Technology; ProKnow-C; Performance Evaluation; Bibliometrics.

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RESUMO

Este trabalho tem como objetivo identificar e conhecer os mais relevantes artigos e seus parâmetros sobre o tema Gestão da Terceirização de Tecnologia da Informação por meio de um processo construtivista – *Knowledge Development Process – Constructivist* (ProKnow-C). Foram selecionados 23 artigos, compondo o Portfólio Bibliográfico (PB). A partir do PB evidenciou-se que: i) o periódico mais presente foi o The Journal of Strategic Information Systems; ii) o artigo mais citado foi Poppo, L. & Zenger, T. (2002); iii) o autor mais presente no PB foi o J. Goo; iv) os autores mais citados em geral foram L. P. Willcocks e M. C. Lacity; v) a palavra-chave mais presente no portfólio foi "*Outsourcing*".

Palavras-Chave: Terceirização; Tecnologia da Informação; ProKnow-C; Avaliação de Desempenho; Bibliometria.

1. INTRODUCTION

A literature review is a primary stage in developing a research project, and shows the baseline of the scientific knowledge development of a chosen topic. In addition, a literature review enables researchers to evaluate the proposed research project´s scientific relevance and the fact it is not redundant (De Macedo, 1995); it also defines the intellectual basis that supports the research being structured (Trentini & Paim, 1999). This stage seems to be essential and supported by Echer (2001), who states that only after a literature review is performed, researchers will be able to develop a scientific discourse that provides a point of view on their chosen topic and evaluate the relevance of the proposed research, avoiding the risk of searching for answers to already answered questions (de Macedo, 1995) or suggesting solutions to an already solved problem, or that presents better solutions in the existing literature (Afonso *et al.*, 2011).

Besides being vast, academic knowledge is disseminated through a variety of publications, editors, and databases, among other sources of research. This wide scope and dissemination of knowledge offer a great challenge to those who want to study a chosen topic. The need to develop a structured process for a literature review arises, with the purpose of, on one hand, increasing and bringing a focus and setting the boundaries of the researchers´ knowledge of their intended research topic, which makes it unique, and, on the other hand, for this unique topic, of selecting a bibliographic portfolio of articles academically relevant and aligned with the topic.

Taking this need into account, this paper presents the process of increasing and bringing a focus into the researchers´ knowledge of IT Outsourcing Management. This process makes it possible, at an initial stage, to select a bibliographic portfolio aligned with the topic and scientifically relevant, proven by the number of times the article has been cited. This bibliographic portfolio represents the "state of the art" in the topic, as understood by the authors, and for the boundaries set by them. After the bibliographic reference is defined, the next stage is the analysis and evidence of the parameters the researchers wish to know. This stage is called bibliometrics.

According to Guedes & Borschiver (2005), bibliometrics dates back to 1922 with the purpose of substantiating technological and scientific processes, by means of document count. Since then, bibliometrics has been increasingly interpreted, and, over the last few decades, researchers such as Pao (1922) have noticed that a portfolio of articles can be statistically studied. Among the parameters to be studied, the following

ones are found: journals, relevance of the articles, relevant authors, and key words, for instance. From this perspective, bibliometrics to do this research is then used with the purpose of showing the most visible parameters related to its topic in accordance with the researchers' own perspective.

In order to develop a robust and academically relevant theoretical framework, it is recommended the use of a process capable of consolidating information in an impartial and consistent manner. From this need, the following question is raised: How to conduct in a structured an unbiased manner the selection and analysis of an academically relevant theoretical framework, aligned with the unique topic of interest?

This paper searches for the answer to this question by adopting a process for the choice and analysis of the theoretical framework of IT Outsourcing Management. This process is composed of a search based on scientific articles available on the Capes website and on the bibliometrics of relevant articles, aligned with the topic of interest.

This paper is divided into five sections. The first section is an introduction to the researched topic and objectives of the paper. The second section presents the theoretical framework of IT Outsourcing Management. The third section presents the research methodology used according to the framing analysis of the research. The fourth section describes the detailed application of the methodology, showing all the stages used to define the bibliographic portfolio and the bibliometrics performed. The fifth section presents conclusions and final considerations, showing the research questions and objectives, and how they were achieved, as well as results and recommendations for future research.

2. IT OUTSOURCING MANAGEMENT

Information Technology, IT, has been increasingly present in a society´s everyday life, especially in the productive and support processes of organizations, whether they are for profit or non-profit. This connection of operations and strategies of organizations with IT refers to a consensus that future prosperity of organizations depends on the quality of their information system (Lee *et al.*, 2003). Consequently, this view of how essential IT is for organizations suggests the complexity of defining, implementing, changing and improving it; that is, addressing the whole life cycle of IT solutions.

Tight budgets and the growing demand for changes in complex organizational environments result in a pressure for results which is difficult to manage. This complexity, associated with increasing pressure for organizational efficiency, has led many managers to adopt IT Outsourcing, ITO, with the purpose of reducing costs of IT operations, and broadening the focus on business core competencies (Roy & Aubert, 2002). In this regard, ITO management has become a critical asset for organizations.

It is possible to define ITO as the contractual provision of services and goods to client organizations by an external organization (Alborz, Seddon & Scheepers, 2005; Gottschalk & Solli-Sæther, 2005). By considering the fact that the relationship between clients and suppliers is a critical connection, ITO can also be described as a development of an interorganizational relationship between clients and suppliers with the purpose of providing IT services (Lee, Miranda & Kim, 2004).

In organizations where ITO is adopted, the outsourcing strategy can be defined as the logic used in a set of IT-related decisions of an organization. Outsourcing choices

represent alternatives for organizations to increase, by means of IT, the potential for achieving their organizational objectives (Lee, Miranda & Kim, 2004). ITO has different angles of analysis. The study by Gottschalk and Solli-Sæther (2005) can be given as an example, in which 11 theories and their related critical success factors are identified. Based on this work, it is possible to see the complexity in the ITO process. According to Lee *et al.* (2003), an integrated view of ITO consists of three perspectives: economic, social and strategic.

By analyzing their scope, studies show that organizations outsource mainly their IT portfolio. When outsourcing practices are analyzed, formal contracts are predominant. Contracts are usually evaluated through the meeting of expectations, level of satisfaction and performance of the services provided (Lacity, Khan & Willcocks, 2009).

However, in the first instance, what seems to be a highly attractive solution to achieve organizational objectives implies risks and challenges for the managers. Past undesired results show that ITO entails special care in planning, implementation and maintenance, thus, each contract is dealt with in a singular manner (Cullen, Seddon & Willcocks, 2005). There is a considerable number of accounts about undesirable consequences by companies which opted for ITO. Improvement of IT service performance, reduction of costs and higher level of user satisfaction, which prompts IT outsourcing, are not always delivered. Some IT outsourcing cases present exactly the opposite (Bahli & Rivard, 2005).

Given the above-mentioned context, there is potential importance to the outsourcing of IT services so that it is possible to ensure that organizational objectives are achieved. Management recommends the adoption of means that enable the measurement of IT service performance, its evaluation and how to improve it. The idea of services must be used as a way to encapsulate, or to simplify the benefits of outsourcing for those who perform its hiring so that the focus is placed on the quality of what is delivered, that is, usefulness and guarantee of the services. In this regard, the concept of IT services by Cannon *et al.* (2011, p. 13) is used, who propose the following:

> *IT Service: A service provided by an IT service provider. An IT service is made up of a combination of information technology, people and processes. A customer-facing IT service directly supports the business processes of one or more customers and its service level targets should be defined in a service level agreement. Other IT services, called supporting services, are not directly used by the business but are required by the service provider to deliver customer-facing services.*

IT service outsourcing management distinguishes itself internally from the IT service production process, as it uses companies to this end. Notwithstanding the wide adoption of IT and ITO industry growth, according to Cullen, Seddon and Willcocks (2005), the generalization found in manufacturing for the production of goods and predominantly in modern administration teaching does not seem to be suitable to the ITO industry. Studies show that there are considerable challenges regarding the development of competencies and the organizational structure for IT service providers in order to meet the needs of the ITO market. These challenges translate into difficulties of measuring ITO performance, which must be evaluated considering many

aspects (Plugge, Buwman & Molina-Castillo, 2013).

As a distinctive factor in IT service outsourcing management, such topics as contract management and relationship management emerge. Poppo and Zenger (2002) suggest that contracts and relationships play complementary roles in the process of exchange between clients and suppliers, creating synergy and trying to maintain their mutual gains. The highlight of contract management and relationship management between organizations is also provided by Zollo, Reuer and Singh (2002), addressing the alliances and cooperation between organizations for the production of mutual results. There is also evidence that contracts and relationships complement one another to achieve the objectives of the service provision relation (Goo *et al.*, 2009).

Relationships can also be evaluated under the perspective of informal contracts, also called relational contracts. They are present in all organizations and in the relationships between organizations. Although they are not written contracts, they have a considerable level of influence on the agreements between parties, having private and common objectives achieved (Baker, Gibbons & Murphy, 2002). Poppo and Zenger (2002) present information that suggests that the quality of the relationship between clients and IT service providers is closely related to the success of IT service provision.

Give the complexity of the subjectivity of relationships, managers have a great challenge as they have to establish what needs to be evaluated and monitored in the relationships in order to ensure their health (Alborz, Seddon & Scheepers, 2005; Lee *et al.*, 2003). As the demand for outsourcing increases, as well as ITO costs in organizations, the alignment of business with ITO strategies becomes a critical question. This requires that senior business directors and executives are involved in setting objectives, implementation and management of the ITO relationship (Lacity, Khan & Willcocks, 2009).

According to Lacity, Khan and Willcocks (2009), ITO is a business meeting discussion item for managers of organizations, as it does not seem to exist a standard and solution to ITO; and that is the reason why this topic fascinates the scientific community.

3. RESEARCH METHODOLOGY

This section of the paper aims to present the methodological procedures used to define and conduct the research, with the intent of achieving objectives and final results

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3.1. THEORETICAL FRAMEWORK

The multiplicity of factors that guide the development of scientific knowledge hinders the setting of a universal standard for activities related to the Scientific Methodology topic. Thus, researchers' first step into this dimension of scientific work is to select the methodological structure or theoretical framework regarded as the most suitable to their purposes.

The proposed theoretical framework for this research was outlined considering: 1) the research objective, ii) the research logic, iii) the research process, iv) the research results, v) technical procedures and vi) instrument of intervention used in the research.

As for its objective, the nature of this research is exploratory and descriptive. Exploratory as it has the purpose of developing knowledge in the researchers and in the

scope of the topic. Knowledge is going to be developed during the process of selection and analysis of scientific articles published in journals, through the interaction with the search results (Vieira, 2002). Descriptive, as it enables the identification of the journals which publish the topic the most, with scientifically relevant articles, relevant authors, as well as the most frequently found key words (Gil, 1999).

As for its logic, the research is classified as inductive as it generates knowledge of an underdeveloped topic. (Iudícibus, 2004). The development of this knowledge takes place by the interaction and choices from the perspective that the researchers wish to provide to their topic regarding the selection of the related bibliographic portfolio.

In the research process, the approach to the research problem is classified as qualitative and quantitative. Qualitative in the process developed in order to identify the articles from the related bibliographic portfolio; quantitative in the analyses performed by counting the number of investigated variables (Richardson, 1999).

Regarding results, the research is classified as applied, as it enables the use of the types of knowledge generated by relevant articles, authors and journals in bibliometrics (Lakatos & Marconi, 2010).

As for technical procedures, the research is characterized as bibliographic, as it is done from the databases available by the Coordination for the Improvement of Higher Education Personnel - CAPES (Sá-Silva, Almeida & Guindani, 2009), including, however, the collection of secondary data (Richardson, 1999).

As for the instrument of intervention, the literature review process called Knowledge Development Process - Constructivist (ProKnow-C) was used, proposed by Ensslin *et al.* (2010). ProKnow-C, from a constructivist perspective, consists in a structure used to make researchers develop the necessary knowledge to initiate the research related to the topic they wish to study. ProKnow-C conducted the process of data collection and analysis, whose results are described in the next section.

4. RESULTS

In this section, the results of the studies developed using the research topic and chosen method are presented.

4.1 BIBLIOGRAPHIC PORTFOLIO SELECTION

The stage where the selection of the bibliographic portfolio is conducted enables the selection of the Bibliographic Portfolio (BP), composed of articles regarded as the most relevant in the academic disciplines of the related research topic. These articles were aligned and their boundaries set using the researchers´ knowledge of the research topic. This stage is developed into two parts:

  i. Selection of articles from databases, composing the Gross Library of articles.
  ii. Filtering the selected articles based on the alignment with the research topic.

The result of the stage of selection of articles consists in a set of articles regarded as relevant by the researchers and aligned with the research topic. This set of articles is called a Bibliographic Portfolio (Ensslin *et al.*, 2010; Afonso *et al.*, 2011; Bortoluzzi *et al.*, 2011; Lacerda, Ensslin and Ensslin, 2012).

4.1.1 SELECTION OF THE GROSS LIBRARY OF ARTICLES

The beginning of the selection of articles from the Gross Library of articles takes place based on the axes of the research; in other words, they are academic disciplines that the researchers regard, according to their own perceptions, as relevant to explain the topic which is the subject of the research project.

In order to apply the ProKnow-C, four research axes were defined. The first axis is associated with the need the researchers have to develop knowledge of the topic so that its monitoring and improvement can be accomplished. Therefore, the first axis addresses "Performance Measurement". Second, third and fourth axes are associated with the context of the research, which are "Information Technology", "Services" and "Outsourcing".

The stage where articles are selected from the Gross Library are composed of four singular parts: a) specifying keywords associated with each one of the axes of the research, b) specifying the article search database, c) search of the articles in the database using keywords, and d) tests performed in order to verify adherence of the keywords.

a) Specifying keywords associated with each one of the axes of the research.

Initially, keywords were specified for each one of the axes of the research, all of them in English in order to increase the number of articles. After the initial keywords were combined, a total of 40 research combinations were formed, used in the databases of the Capes website.

An iterative process using the keywords was developed evaluating search results, examining 50 articles in the search results for each combination of keywords and determining the need to change keywords forming a new configuration of keywords. After repeating the search three times and performing an inspection, a new configuration of keywords is obtained, presented in Table 1.

Table 1 – List of Axes and Final Keywords

	Performance Measurement	Information Technology	Services	Outsourcing
01	*Management*	*"Information System"*	*Service*	*Outsourcing*
02	*Evaluation*	*"Information Technology"*	*Provider*	*Contract*
03	*Assessment*	-	*Relationship*	*Offshoring*
04	*Performance*	-	*Partnership*	-
05	*Appraisal*	-	-	-
06	*Measurement*	-	-	-

Source: Developed by the authors (2014), using the ProKnow-C Process (Ensslin et al., 2010).

Having the keywords in Table 1 combined, a total of 144 search combinations were formed.

b) Specifying the article search database

After specifying the keywords, the databases aligned with the academic disciplines were searched for on the CAPES journal website, those regarded by the authors as relevant to the research; then, the databases of the Applied Social Sciences field of research were selected. 151 databases were identified, where 10 of them could be potentially used to contribute articles, after analysis of the number of articles presented and alignment with the topic of the research. The selected databases consisted of Boolean search tools, which enabled, by means of the composition in Figure 1, to search the articles.

Boolean Search Equation

(Management OR Evaluation OR Assessment OR Performance OR Appraisal OR Measurement) AND ("Information System" OR "Information Technology") AND (Service OR Provider OR Relationship OR Partnership) AND (Outsourcing OR

Figure 1 – Keywords and Boolean Search Equation used in the search of articles.

Source: Developed by the authors (2014), using the ProKnow-C Process (Ensslin et al., 2010).

The 10 databases selected to compose the research database were: SCOPUS, PROQUEST, INFORMS JOURNAL, WEB OF SCIENCE, ONEFILE, EBSCO, WILEY, ELSEVIER (SCIENCE DIRECT), EMERALD and HIGHWIRE.

a) Search of the articles in the databases using keywords.

In addition to the keywords (Boolean Search Equation), the following filters/fields of the article for the research were used: article title, abstract and keywords. The types of documents were also selected, which were restricted to journal articles and to the timeline of the documents as of the year 2000.

Time restriction for the articles as of the year 2000 are aimed to increase the focus on recent publications, evaluate contents reflected in the latest technological changes and to make the research project possible to be conducted in the available window of opportunity. From the identification of the databases for article searches and searches using the Boolean search equation, the searches in the 10 databases were performed and, considering the filters specified by the authors, 3.470 publications were found, which then composed the Gross Library of articles

d) tests performed in order to verify adherence of the keywords.

Once the selection of articles from the Gross Library of articles was concluded, a test was performed in order to ensure adherence of the keywords to the selected articles. The adherence test was performed by means of an inspection of two randomly selected articles out of the existing 3.470 articles. It was found that in the configuration of 15 keywords of the research, 6 of them were found in the articles inspected, ensuring that the configuration of the keywords was aligned for the selected databases and composition of the Gross Library of articles.

4.1.2 FILTERING OF THE GROSS LIBRARY OF ARTICLES

The Gross Library of articles, composed of 3.470 publications, was analyzed

considering the following aspects: i) whether the articles were not repeated, ii) whether the titles of the articles were aligned with the research topic, iii) whether the articles were scientifically relevant (number of citations in Google Scholar), iv) whether the abstracts of the articles were aligned with the research topic, and v) whether the full texts of the articles were aligned with the research topic.

The publications selected from the databases were imported into a virtual library, using the EndNote application software. Through EndNote and data evaluation by the researchers, it was found that from the 3.470 articles, 446 of them were repeated; therefore, 3.024 unrepeated articles were left for evaluation in the next stages.

As soon as the redundancy analysis stage is concluded, the next filter consists in analyzing adherence by title of the 3.024 articles related to the research topic. A sizeable number of articles were found, but from areas unrelated to information technology; therefore, they were rejected. At this stage, 2.264 articles were rejected, and a total of 760 non-redundant articles and aligned by their titles with the research topic were kept. The remaining 760 articles were subject to scientific relevance analysis and, in order to perform it, the number of citations of each article was used, provided by Google Scholar. For the next step, the researchers decided to keep, from the Gross Library of articles, publications indexed in a decreasing manner from the highest number of citations on Google Scholar, which composed up to 92% of all the citations. This process resulted in the selection of 174 articles from the Gross Library of articles, with publications containing from 22 to 872 citations. The 174 articles from the Gross Library of articles were subject to the analysis of their abstracts, aligned with their research topic. After analysis of the abstracts, 24 unrepeated articles were found, scientifically relevant, and titles and abstracts aligned with the research topic. From these 24 articles, an Author Database was composed, with 73 researchers used in the previous stages.

The other 586 articles, whose scientific relevance was not confirmed, were later analyzed. This analysis was performed as, though these articles still do not have scientific relevance based on the number of citations, they may belong to relevant authors. Through a reanalysis process, using the Author Database and an evaluation of recent articles (from years 2014, 2013 and 2012), 70 articles were considered as having potential future scientific relevance. It was also clear that among the 516 rejected articles, as they did not have scientific relevance and published more than two years before the analysis, 25 of them had been published by authors from the Author Database out of the 24 articles with scientific relevance, with titles and abstracts aligned with the research topic. The 70 articles which had been published recently, together with the 25 articles written by relevant authors in the context of the research, were subject to the analysis of the abstracts aligned with the research topic.

From this analysis, 10 articles were selected, containing such aligned abstracts, and added to the 24 articles, titles and abstracts aligned to the research topic. At this stage, it was possible to compose a Database of Non-Repeated Articles, with Titles and Abstracts Aligned with the Research Topic and with Scientific Relevance, containing 34 articles.

After the end of filtering of the Gross Library of articles, the 34 selected articles were analyzed as to the alignment of their full text with the research topic. All the 34 articles had full text access on the Capes website, not being possible to remove any of them from full text analysis. After full text analysis was performed, 20 articles were selected for the Primary Bibliographic Portfolio, and the remaining 14 articles were

rejected due to the lack of alignment with the content of the research topic. The filtering process resulted in a Primary Bibliographic Portfolio of 20 articles, presented in Table 2.

Table 2 –Primary Bibliographic Portfolio of the Articles

Primary Bibliographic Portfolio
Alborz, S., Seddon, P., & Scheepers, R. (2005). The quality-of-relationship construct in IT outsourcing. PACIS 2005 Proceedings, 93.
Argyres, N. S., Bercovitz, J., & Mayer, K. J. (2007). Complementarity and evolution of contractual provisions: An empirical study of IT services contracts. Organization Science, 18(1), 3-19.
Bahli, B., & Rivard, S. (2005). Validating measures of information technology outsourcing risk factors. Omega, 33(2), 175-187.
Cullen, S., Seddon, P. B., & Willcocks, L. P. (2005). IT outsourcing configuration: Research into defining and designing outsourcing arrangements. The Journal of Strategic Information Systems, 14(4), 357-387.
Domberger, S., Fernandez, P., & Fiebig, D. G. (2000). Modelling the price, performance and contract characteristics of IT outsourcing. Journal of Information Technology, 15(2), 107-118.
Ekanayaka, Y., Currie, W. L., & Seltsikas, P. (2003). Evaluating application service providers. Benchmarking: An International Journal, 10(4), 343-354.
Goo, J. (2010). Structure of service level agreements (SLA) in IT outsourcing: The construct and its measurement. Information Systems Frontiers, 12(2), 185-205.
Goo, J., Huang, C. D., & Hart, P. (2008). A Path to Successful IT Outsourcing: Interaction Between Service-Level Agreements and Commitment. Decision Sciences, 39(3), 469-506.
Goo, J., Kishore, R., Rao, H. R., & Nam, K. (2009). The role of service level agreements in relational management of information technology outsourcing: an empirical study. Management Information Systems Quarterly, 33(1), 8.
Gottschalk, P., & Solli-Sæther, H. (2005). Critical success factors from IT outsourcing theories: an empirical study. Industrial Management & Data Systems, 105(6), 685-702.
Huang, C.D., & Goo, J. (2009). Rescuing IT Outsourcing: Strategic Use of Service-Level Agreements. IT Professional, 11(1), 50-58.
Kishore, R., Rao, H. R., Nam, K., Rajagopalan, S., & Chaudhury, A. (2003). A relationship perspective on IT outsourcing. Communications of the ACM, 46(12), 86-92.

Primary Bibliographic Portfolio
Lacity, M. C., Khan, S. A., & Willcocks, L. P. (2009). A review of the IT outsourcing literature: Insights for practice. The Journal of Strategic Information Systems, 18(3), 130-146.
Lee, J. N., Huynh, M. Q., Kwok, R. C. W., & Pi, S. M. (2003). IT outsourcing evolution: past, present, and future. Communications of the ACM, 46(5), 84-89.
Lee, J. N., Miranda, S. M., & Kim, Y. M. (2004). IT outsourcing strategies: Universalistic, contingency, and configurational explanations of success. Information Systems Research, 15(2), 110-131.
Lin, C., Pervan, G., & McDermid, D. (2007). Issues and recommendations in evaluating and managing the benefits of public sector IS/IT outsourcing. Information Technology & People, 20(2), 161-183.
Pati, N., & Desai, M. S. (2005). Conceptualizing strategic issues in information technology outsourcing. Information Management & Computer Security, 13(4), 281-296.
Plugge, A., Bouwman, H., & Molina-Castillo, F. J. (2013). Outsourcing capabilities, organizational structure and performance quality monitoring: Toward a fit model. Information & Management, 50(6), 275-284.
Roy, V., & Aubert, B. A. (2002). A resource-based analysis of IT sourcing. ACM SIGMIS Database, 33(2), 29-40.
Whitten, D., & Wakefield, R. L. (2006). Measuring switching costs in IT outsourcing services. The Journal of Strategic Information Systems, 15(3), 219-248.

Source: Developed by the Authors (2014), using the ProKnow-C Process (Ensslin et al., 2010).

Based on the articles presented in Table 2, a Representativeness Test (exhaustive) was performed and described in the section below.

4.1.3 REPRESENTATIVENESS TEST OF THE BIBLIOGRAPHIC PORTFOLIO

This test is performed by computing the number of citations in the bibliographic references of the Primary Bibliographic Portfolio (Table 2), with the aid of Google Scholar. Publications containing 80% of the citations were searched. A total of 54 articles in 217 bibliographic references in the Primary Bibliographic Portfolio were retrieved. Three articles were found; that is, they were aligned with the research topic, according to the researchers´ perception. These three articles were then added to the Primary Bibliographic Portfolio, which, at this stage, is composed of 23 articles. The three additional articles are presented in Table 3.

Table 3 – Additional articles from the references in the Primary Bibliographic Portfolio

Baker, G., Gibbons, R., & Murphy, K. J. (2002). Relational Contracts and the Theory of the Firm. Quarterly Journal of Economics, 39-84.
Poppo, L., & Zenger, T. (2002). Do formal contracts and relational governance function as substitutes or complements? Strategic management journal, 23(8), 707-725.
Zollo, M., Reuer, J. J. & Singh, H. (2002). Interorganizational routines and performance in strategic alliances. Organization Science, 13(6), 701-713.

Source: Developed by the Authors (2014), using the ProKnow-C Process (Ensslin et al., 2010).

4.2 BIBLIOMETRICS

Once the stage of bibliographic portfolio section was concluded, the bibliometrics of the Bibliographic Portfolio, containing 23 articles (Table 2 and Table 3), took place. Bibliometrics is a type of analysis that consists in the application of statistical and mathematical methods (da Fonseca, 1973) on selected articles so that it is possible to quantify existing information and map the knowledge structure of a given scientific field. This analysis is used as an evaluation tool of researchers´ behavior in their decisions to develop knowledge (Pritchard, 1969; Caldas & Tinoco, 2004; Bufrem & Prates, 2005).
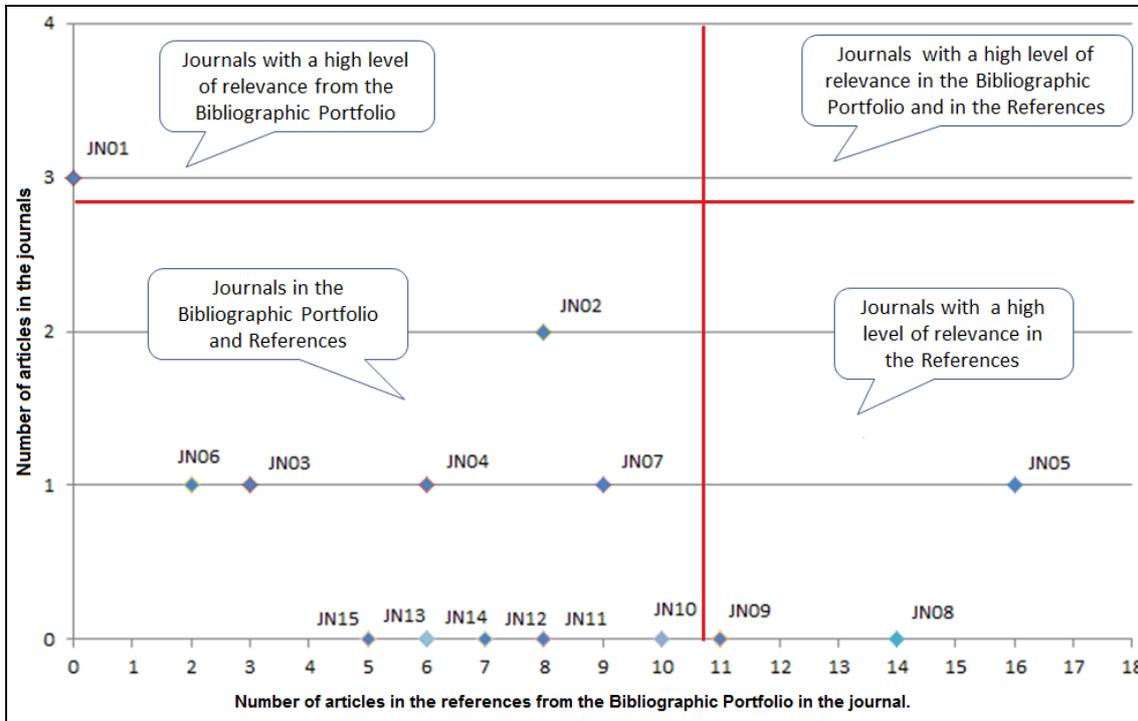
The Bibliometrics of the Bibliographic Portfolio composed for this research was compiled in four phases: i) measure of the scientific relevance of the journals, ii) measure of the relevance of the articles, ii) measure of the relevance of the authors, and v) measure of the most used keywords (Lacerda *et al.*, 2011; Afonso *et al.*, 2011; Azevedo *et al.*, 2011; da Rosa *et al.*, 2011; Lacerda *et al.*, 2012; da Rosa *et al.*, 2012).

The set of data to be analyzed by bibliometrics was composed of 23 articles from the Primary Bibliographic Portfolio and of the 217 articles from bibliographic references in the articles from the Primary Bibliographic Portfolio.

4.2.1 LEVEL OF RELEVANCE OF THE JOURNALS

The first analysis was performed in order to identify the journal, in the Bibliographic Portfolio, with the highest number of articles. The articles from the Bibliographic Portfolio were published in 19 different journals, and it was found that The Journal of Strategic Information Systems is the one with the highest level of relevance, containing three publications, followed by Communication of the ACM and Informs – Organization Science, both journals containing two publications. Next, the journal with the highest number of publications was analyzed, among the articles of the references in the Bibliographic Portfolio. The references in the Bibliographic Portfolio were published in 88 different journals, and the journals with the highest level of relevance were: Management Information Systems, MIS Quarterly: Executive an Information and Management, respectively with 16, 14 and 11 articles. The third analysis compares the relevance (number of articles) of the journals from the Bibliographic Portfolio and the relevance (number of articles) of the journals in the

references in the Bibliographic Portfolio, where it is evident that: i) none of the journals have simultaneously a high level of relevance in the Bibliographic Portfolio and in the references; ii) The Journal of Strategic Information Systems (JN01) is relevant with (number of articles) the Bibliographic Portfolio and iii) the MIS Quarterly journals: Management Information Systems (JN05), MIS Quarterly: Executive (JN08) and Information and Management (JN09) are relevant (number of articles) with the references from Bibliographic Portfolio.

Figure 2 –Relevance of the journals of the Bibliographic Portfolio and references of the research.

Source: Developed by the Authors (2014), using the ProKnow-C Process (Ensslin et al., 2010).

Description of the codes used in Figure 2, with the full titles of the journals is presented in Table 4 below.

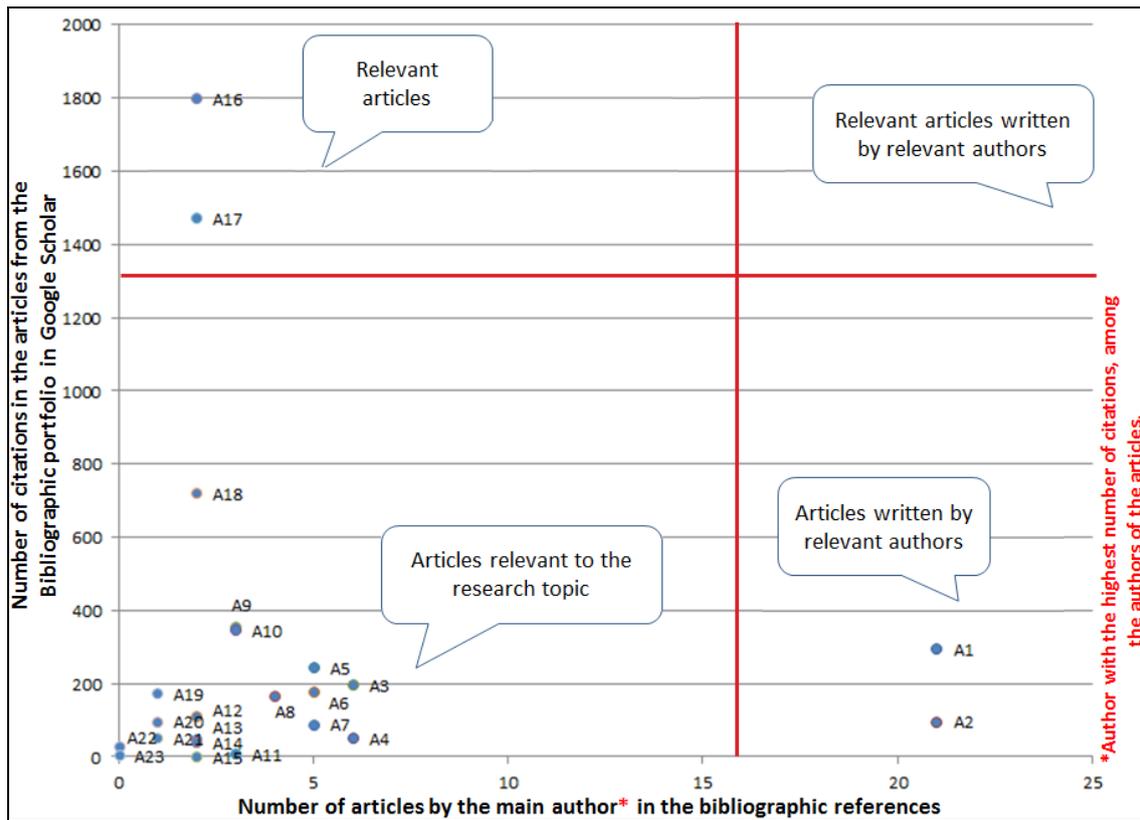**Table 4 – Table of the codes used in** Figure 2 **with the title of the journals**.

Code	Title Name of the Journal	Code	Full Title of the Journal
JN01	The Journal of Strategic Information Systems	JN09	Information and Management
JN02	Communications of the ACM	JN10	Journal of Strategic Information Systems
JN03	Decision Sciences	JN11	Information Systems Research
JN04	Information Technology & People	JN12	Journal of Information Technology
JN05	MIS Quarterly: Management Information Systems	JN13	Journal of Management Information Systems
JN06	Quarterly Journal of Economics	JN14	Organization Science
JN07	Strategic Management Journal	JN15	Industrial Management and Data Systems
JN08	MIS Quarterly Executive	-	-

Source: Developed by the Authors (2014), using the ProKnow-C Process (Ensslin et al., 2010).

4.2.2 LEVEL OF SCIENTIFIC RELEVANCE OF THE ARTICLES

Citation counts in an article were adopted to identify the scientific relevance of an article, through a search in Google Scholar, which is an open and widely used tool, and which constantly updates citations, through the Google search engines. Analyzing the articles from the Bibliographic Portfolio regarding scientific relevance, it is found that the article by Poppo and Zenger (2002) is the one with the highest level of relevance, with 1.799 citations. Next, it is analyzed the scientific relevance of the articles in the references of the articles that compose the Bibliographic Portfolio; in this analysis, it is highlighted the presence of Poppo and Zenger (2002), Kern and Willcocks (2002) and Choudhury and Sabherwal (2003), with six citations each one of them.

The third analysis compares the number of citations in the articles from the Bibliographic Portfolio and the number of citations by the most cited author of each of the articles in bibliographic references, based on Google Scholar. In this analysis, it is evident that: i) no article with a high number of citations was written by an author with a high number of articles in the references of the Bibliographic Portfolio, ii) the articles by Poppo and Zenger (2002) [A16] and Baker *et al.* (2002) [A17] have a high number of citations in the Bibliographic Portfolio and iii) articles by Lacity *et al.* (2009) [A1] and Cullen *et al.* (2005) [A2] are the ones with a high number of article authorship in the references of Bibliographic Portfolio. The results are described in Figure 3.

Figure 3 – Articles and their authors in the Bibliographic Portfolio

Source: Developed by the Authors (2014), using the ProKnow-C Process (Ensslin et al., 2010).

The description of the codes used in Figure 3 with the full title of the journals is presented in Table 5 below.

Table 5 – Codes used in **Figure 3** with a reference of the compared articles.

Code	Article	Code	Article
A1	M. C. Lacity *et al.* (2009)	A13	J. Goo (2010)
A2	S. Cullen *et al.* (2005)	A14	J. Goo *et al.* (2008)
A3	B. Bahli *et al.* (2005)	A15	C. D. Huang *et al.* (2009)
A4	C. Lin *et al.* (2007)	A16	L. Poppo *et al.* (2002)
A5	J. Goo *et al.* (2009)	A17	G. Baker *et al.* (2002)
A6	R. Kishore *et al.* (2003)	A18	M. Zollo *et al.* (2002)
A7	V. Roy *et al.* (2002)	A19	P. Gottschalk *et al.* (2005)
A8	N. S. Argyres *et al.* (2007)	A20	S. Domberger *et al.* (2000)
A9	J.-N. Lee *et al.* (2004)	A21	Y. Ekanayaka *et al.* (2003)
A10	L. Jae-Nam *et al.* (2003)	A22	N. Pati *et al.* (2005)
A11	S. Alborz *et al.* (2005)	A23	A. Plugge *et al.* (2013)
A12	D. Whitten *et al.* (2006)	-	-

Source: Developed by the Authors (2014), using the ProKnow-C Process (Ensslin et al., 2010).

4.2.3 LEVEL OF RELEVANCE OF THE AUTHORS

The purpose of the first analysis is to identify the most relevant authors among the 73 authors who compose the Author Database from the Bibliographic Portfolio. In this analysis, J. Goo is the most relevant author, with 4 articles in the Bibliographic Portfolio. Next, an analysis of the most relevant authors is performed, among the 400 authors in the articles in the references from the Bibliographic Portfolio. This analysis showed that the author with the highest number of articles was L. P. Willcocks (A1), with two publications in the Bibliographic Portfolio and 21 publications in the references of the Bibliographic Portfolio.
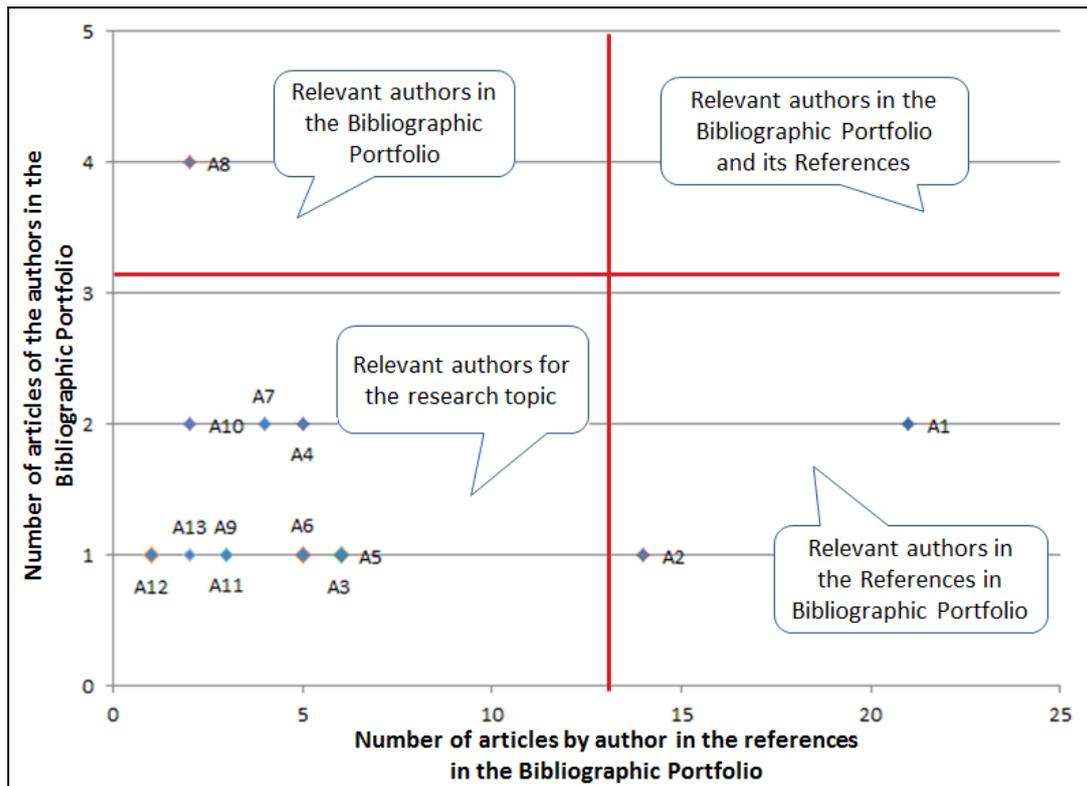
Figure 4 – Most relevant articles and authors in the Bibliographic Portfolio

Source: Developed by the Authors (2014), using the ProKnow-C Process (Ensslin et al., 2010).

Description of the codes used in Figure 4 with the full title of the journal is presented in Table 6 below.

Table 6 – Codes used in **Figure 4** with the names of the authors.

Code	Author	Code	Author	Code	Author
A1	L. P. Willcocks	A6	B. A. Aubert	A11	P. B. Seddon
A2	M. C. Lacity	A7	H. R. Rao	A12	S. M. Miranda
A3	C. Lin	A8	J. Goo	A13	D. Whitten
A4	R. Kishore	A9	K. J. Mayer	-	-
A5	S. Rivard	A10	K. Nam	-	-

Source: Developed by the Authors (2014), using the ProKnow-C Process (Ensslin et al.,

2010).

The third analysis compares the number of articles published by authors in the Bibliographic Portfolio and the number of articles by each author in the references in the Bibliographic Portfolio, making evident that: i) no relevant authors were found in the Bibliographic Portfolio or in its references at the same time, ii) relevant author in the Bibliographic Portfolio continues to be J. Goo (A8) and relevant authors in the references of the Bibliographic Portfolio continue to be L. P. Willcocks (A1) and M. C. Lacity (A2).

4.2.4 MOST USED KEYWORDS

The purpose of this analysis was to identify the most used keywords in the Bibliographic Portfolio and also their references. In the articles of the Bibliographic Portfolio, 74 keywords were found.

Among the keywords, the ones that appeared more frequently were "Outsourcing", which was used 8 times and the term "IT outsourcing", which was used five times. This standard is found in keywords of the references in the Bibliographic Portfolio, where "Outsourcing" comes up 40 times, and the term "IT Outsourcing" comes up 18 times. It is worth mentioning that in the references in the Bibliographic Portfolio, keywords "Information Technology" come up 14 times. It is important to highlight the fact that all relevant keywords are part of a set of words used to define the research topic.

4.2.6 RELEVANCE OF JOURNALS IN THE BIBLIOGRAPHIC PORTFOLIO

In order to verify the relevance of the journals in the Bibliographic Portfolio, an analysis of JCR[1] and JSR[2] indexes of the year 2013 was performed, with relevant journals in Figure 2, with articles in the Bibliographic Portfolio; that is, The Journal of Strategic Information Systems and the MIS Quarterly: Management Information Systems. In Figure 5, the collected data was the input to measure the relevance of such journals.
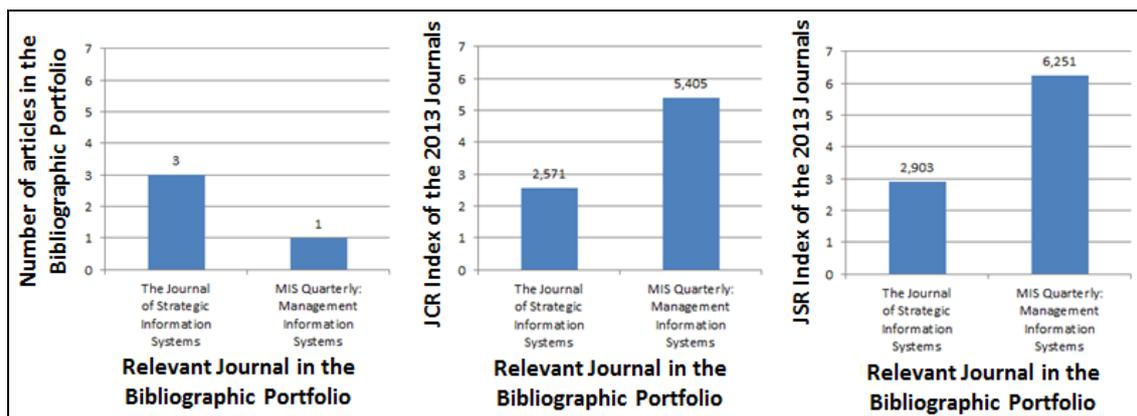
Figure 5 – Relevant journals with the number of articles in the Bibliographic portfolio and JCR and JSR indexes.
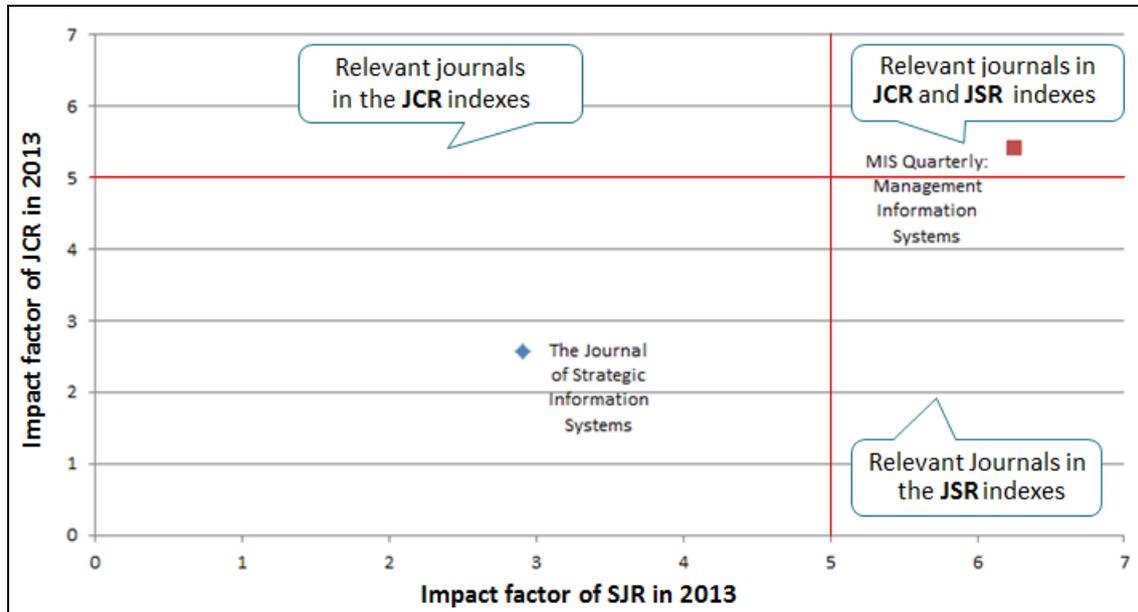
Source: Developed by the Authors (2014), using the ProKnow-C Process (Ensslin et al., 2010).

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[1] For further information on JCR, please refer to http://thomsonreuters.com/journal-citation-reports/
[2] For further information on JSR, please refer to http://www.scimagojr.com/index.php

It was found that although the Journal of Strategic Information Systems has more articles in the Bibliographic Portfolio than in the MIS Quarterly: Management Information Systems, it does have a higher JCR index and relative JS index; therefore, it can be used as a potential source of articles for the search of knowledge on the state of the art in IT Outsourcing Management.

The abovementioned finding is reaffirmed by the Table in Figure 6 when the indexes JCR and JSR were compared for the two analyzed journals.

Figure 6 – Analysis of JCR and JSR indexes for the two main journals in the Bibliographic Portfolio

Source: Developed by the Authors (2014), using the ProKnow-C Process (Ensslin et al., 2010).

The MIS Quarterly: Management Information Systems is a journal whose objective is the development and communication of knowledge of the development of IT-based services, management of IT resources, use, impact and economy related to IT and impact on the management of organizations, organizational and social implications regarding the use of IT. Professional problems related to the information systems are also addressed in this journal. The focus of the journal consolidates the indicators obtained, which have a strong connection with the research topic, whether by management, by IT, from the perspective of services or outsourcing, axes of the research topic in this paper.

Complementary, the SJR index of the 2013 journal is of 6.251 and among the journals dedicated to management, business and accounting, a total of 1.275, it ranks 13th place in scientific relevance. As to the evaluation of the JCR index of the journal, of 2013 as well, is of 5.405 and among the journals dedicated to computer science and information systems, in which the journal is classified, it ranks 4th place out of the 135 journals, highlighting the importance of the journal to the research. Despite the relevance of the MIS Quarterly: Management Information Systems, the Journal of Strategic Information Systems must be regarded as a source of information, as their JSR and JCR indexes of are, respectively, 2.903 and 2.571 and make them rank, respectively, 42th and 16th places in the same classification as the MIS Quarterly: Management Information Systems.

5. FINAL CONSIDERATIONS

With the development and density of the use of information technologies and communication in organizations, the interest in the adoption outsourcing IT services grows proportionally. Among the reasons for this interest, keeping focus on business, cost reduction and access to specialist resources are highlighted. Therefore, researchers believe that performance measurement, as an instrument of decision support to the analysis of the adoption of IT outsourcing and also in the management of IT may contribute in a positive manner to the topic. In this paper a process was used to select and analyze the theoretical framework on performance measurement and IT outsourcing management. In order for this objective to be achieved, different stages were presented together with the results in each one of them.

The composition of the Bibliographic Portfolio, one of the main results of this research, can be summarized in two parts: the first one with the selection of a gross library of articles, performed by means of article searches in the 10 databases available on the CAPES journal website. These searches, using a set of keywords refined by means of an iterative process, resulted in a set of refined 3.470 articles that were used as input. After filtering of the Gross Library of articles, the Bibliographic Portfolio was composed with 23 articles which, according to the researchers´ criteria and to the instrument of intervention, are aligned with the research topic.

In addition to the Bibliographic Portfolio, the parameters of this list emerged in relation to the authors, articles, journals and keywords, the researchers could realize that topics related to the research field of relationship management and contract management has been drawing researchers' attention over the last few years.

After this process was performed, it was identified that i) The Journal of Strategic Information Systems was the one with the highest level of relevance; ii) the article by Poppo and Zenger (2002) was the one with the highest number of citations; iii) the author most present in the Bibliographic Portfolio was J. Goo, and the most cited ones were L. P. Willcocks and M. C. Lacity; iv) the most used keyword were "Outsourcing" and the term "IT Outsourcing".

It is prudent to highlight that this paper was developed based on the relevance of the research topic, judged from the researcher's perspective, which is unique; therefore, the achieved results are applied to their own perspective. This perspective was also limited by the timeline of the articles, publications from the year 2000 on were analyzed, and also by the fact that only articles fully accessed by the CAPES journal website were used.

The process suggested by ProKnow-C is recommended as to its use, by other researchers, for its structured and exhaustive system for searching and analyzing of results. For future studies, it is recommended that a significant Bibliographic Portfolio of the state of art in the research topic, as per researcher´s perspective, be subject to analyses in order to provide the emerging aspects in its content, with benchmarking and opportunities to be used. New applications of the method of intervention are also recommended, with other researchers´ perspective of the research topic, so that highlighted information can be compared.

Finally, the continuation of this research study is also encouraged, with the development of two missing stages of the ProKnow-C: a) systemic analysis, that is, Bibliographic Portfolio content analysis; and b) identification of research scientific opportunities, suggesting research questions and objectives.

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ERRATA

No artigo: "IT outsourcing management: the state of the art recognition by a constructivist process and bibliometrics" publicado no periodic "JISTEM – Journal of Information Systems and Technology Management", volume 12, número 2 de 2015., no Abstract, onde se lia:

> "This paper underlines the task characteristics of the emergency management life cycle. Moreover, the characteristics of three ubiquitous technologies including RFID, handheld computers and GIS are discussed and further used as a criterion to evaluate their potential for emergency management tasks. Built on a rather loose interpretation of Task-technology Fit model, a conceptual model presented in this paper advocates that a technology that offers better features for task characteristics is more likely to be adopted in emergency management. Empirical findings presented in this paper reveal the significance of task characteristics and their role in evaluating the suitability of three ubiquitous technologies before their actual adoption in emergency management.
>
> **Keywords:** Emergency management; RFID; Task-technology Fit Model; Ubiquitous Technologies"

Leia-se:

> "The objective of this paper is to improve the knowledge of researchers on the subject of Information Technology Outsourcing (ITO) Management, identifying their most relevant articles and their issues by the use of a constructivist process - Knowledge Development Process - Constructivist (ProKnow-C). For this purpose, publications were identified in the literature, aligned with the subject, resulting in a Bibliographic Portfolio with 23 articles. Using the Bibliographic Portfolio, it was shown that: i) the most present journal was The Journal of Strategic Information Systems; ii) the most cited article was Poppo, L. & Zenger, T. (2002); iii) the most present author was the J. Goo; iv) the most cited authors in general were L. P. Willcocks and M. C. Lacity; v) the most present keywords in the portfolio was "Outsourcing".
>
> **Keywords:** Outsourcing; Information Technology; ProKnow-C; Performance Evaluation; Bibliometrics."