

A TREND ANALYSIS OF INFORMATION SYSTEMS SOURCING

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ABSTRACT

Drawing from previous analyses made in the discipline of information systems sourcing, this study focuses on the examination of relevant construct relationships found within 1,883 articles in the literature published within the last twenty years. Network examination tools are used to conduct content-analysis based on 22,858 keyword dyads. Descriptive results display a growing trend in the study of hypothetical concepts that may be explained by several referents related to the behaviors, attitudes, outcomes, processes, experiences, manifestations and indicators connected with an organizational decision process to procure a supply of resources needed by an information systems process, otherwise known as Information Systems Sourcing constructs. The network analysis results also reveal that the most predominant Information Systems Sourcing construct dyads are: strategy & performance, strategy & planning, contracts & outsourcing, strategy & management, strategy & industry, and strategy & international settings.

Keywords: Information Systems Sourcing, Constructs Content-Analysis, Trend Analysis

INTRODUCTION

Since Kodak's revolutionary decision to change the sourcing of its information systems in 1989, corporations and small-businesses alike have been forced to evaluate the most effective way to deliver results from internal functions of their business. The driving forces behind this trend have normally been to reduce and control operating costs, improve host company focus, gain access to globally competitive resources, share risks across partnerships and free resources for other purposes (Hirschheim et al., 2009; Huang & Goo, 2009) These changes in the information age have been characterized by the emergence of the internet, the outsourcing of employees, the replacement of hierarchies in favor of contracts, the rise of electronic social networks and virtual teams as well as strong environmental forces such as security threats and economic turmoil (Leung et al., 2005). The spring of different types of sourcing decisions has resulted in the massive diffusion of sourcing contracts reaching trillions of dollars collectively (Clott, 2004). Consequently, the literature has placed particular attention to several constructs that affect the

sourcing decision making process; however, scholars suggest that the discipline is limited in scope because it has not taken a broader approach to social exchange issues (Koong et al., 2007). Thus, a global analysis of the actual *relationships* between those sourcing constructs rather than aggregated themes would provide a closer insight to the dimensions of this expanding business modus operandi. Cronbach and Meehl (1955) define a hypothetical construct as a “concept for which there is not a single observable referent, which cannot be directly observed, and for which there exist multiple referents, but none all-inclusive”. Thus, we define *information systems sourcing constructs* as those variables that are not directly observable, but hypothetical concepts that may be explained by several referents related to the behaviors, attitudes, outcomes, processes, experiences, manifestations and indicators connected with an organizational decision process to procure a supply of resources needed by a business information systems process. Rather than focusing on specific indicators or constructs, this paper aims to focus on the most salient interactions between IS sourcing constructs.

Borrowing from previous accomplishments, we aim to provide a taxonomy of trends of sourcing *construct relationships, or construct dyads*, over the last twenty years thereby offering an alternative methodology that is intended to advance the insight on the direction of this stream of research as well as assist practitioners to easily identify relevant expertise drawn from applied science. The rest of this paper is organized into the following sections: first we propose a series of research questions that will guide our analysis of the literature; we then conduct a literature review of trend analyses in the area of Information Systems Sourcing; we describe the methodology followed to collect, catalogue and analyze our data; we provide the results of network analysis of literature construct relationships; we provide a discussion of the most salient relationships highlighted by the network analysis, including a review of important seminal papers on those areas; and, finally we conclude with suggestions of future direction of research in this field.

DEVELOPMENT OF RESEARCH QUESTIONS

As we review a substantial part of the literature in Information Systems Sourcing, we pay special focus on the following research questions:

- *Has the importance of IS sourcing increased?*
- *What is trending in IS sourcing research?*
- *What are the fluctuations in IS sourcing research over time?*
- *What are the trends in authorship collaboration in IS sourcing research?*
- *How international is the scope of IS sourcing research?*
- *What sourcing dyads have garnered attention?*
- *Where are the gaps in this discipline?*
- *What are the construct relationships associated with:*
 - *Success/outcome factors?*
 - *Economic value?*
 - *Sourcing decisions?*

- *Risk management?*
- *ICT?*
- *Strategy?*
- *Global Information System?*
- *Economic Decline?*
- *Political/Institutional Forces?*
- *Culture?*

LITERATURE REVIEW

Renowned scholars have compiled the best research that has been conducted in different areas of sourcing and shoring (Dibbern et al., 2004; Dedrick & Kraemer, 2009; King et al., 2009) providing comprehensive and descriptive summaries of research trends. The literature has explored some of the areas affecting sourcing decisions including the special invitations for scholarly research on social, managerial, and knowledge-related aspects of IS sourcing, and how these aspects affect engineering, technology, and innovation management (Sabherwal, 2010). While these findings are extremely valuable to the literature, recent drastic economic changes and institutional instability around the world might raise questions that might have not been addressed in the past. As more components are included by scholars in the stream of research, a comprehensive thematic approach which examines the trends in this field would assist both scholars and practitioners in understanding new directions and new relationships while highlighting those previously established sourcing dynamics. A broader picture of the literature is often necessary to further the advance of a field (e.g. Parra et al., 2012). Even though previous contributions have successfully explained certain aspects of sourcing decisions through the application of transaction cost, agency, and resource dependence theories (e.g. Koong et al., 2007), most research has been limited to one type of sourcing. Previous trend analyses, while exceptionally indispensable, have not looked at all interactions of the constructs affecting sourcing and have relied on coding methodologies that use a “best fit” categorization approach which forces manuscripts to be coded to only one theme, ignoring the possibility that manuscripts may be relevant to multiple themes.

METHODOLOGY

Valuable alternative approaches in discovering interesting patterns on text documents have been offered by information systems scholars (Feldman & Dagan, 1995; Lent et al., 1997), such cataloguing, may be expanded by focusing on the relationships between constructs, rather than individual constructs. Kenny, Kashy and Cook (2006) provide specific guidelines for dyadic data analysis, proposing the Actor-Partner Interdependence Model as the main method to analyze dyadic relationships. Both members of a dyadic relationship are assumed to have actor and partner effects. In undistinguishable models such as the case of constructs in this study, the partner and actor effects are assumed to be equal. Based on this premise, we propose to explain deeper phenomena patterns in previous literature by analyzing the prevailing relationships in the form of ties (relationships) of nodes (constructs) rather than the individual constructs themselves. However, we adopt only a portion of Kenny et al.’s (2003) methodology in order to conduct the analysis based on the lack of measurable variables that may predict partner and actors effects.

The following major steps were conducted to address our research questions: (1) a systematic selection of articles that study information systems sourcing; (2) an extraction of keywords provided by authors at the time of publication; (3) the creation of a taxonomy of keywords into conglomerations of information systems sourcing constructs; (4) systemic identification of relationships between constructs for each article; (5) we highlight relevant trending patterns through descriptive statistics (6) and, we provide measurements of centrality based on network analysis.

Data Collection and Coding Process

The target pool of articles included 40 information systems, management and international journals. The selection process was primarily based on Dibbern et al.'s (2004) selection of journals. In order to expand our reach, we combined and averaged the suggested ranking of several information systems to generate the top 30 journals; specifically, we merged the ranked journals suggested by Rainer and Miller (2005), Lowry, Karuga and Richardson (2007), Katerattanakul, Han, and Hong (2003), Peffers & Tang (2003), Mylonopoulos & Theoharakis (2001), Whitman, Hendrickson and Townsend (1999), Hardgrave and Walstrom (1997) and Walstrom, Hardgrave and Wilson (1995). In addition, we included Dibbern et al.'s (2004) list along with a few other international journals with relevancy to information systems or global sourcing. Only those journals that were indexed by either: Academic Search Complete, Psychology and Behavioral Sciences Collection, Business Source Complete or Inspec remained on our merged list; all others were excluded. Table 1 provides a list and our suggested ranking of all the journals ultimately used in the selection process. IEEE Transactions on Knowledge and Data Engineering and IEEE Transactions on Parallel & Distributed Systems were considered to have the same ranking; as such, both journals were given the 12th place in our rank.

The initial selection yielded 2,500 unique articles with more than 30,000 keywords. Upon extraction, all abstracts were examined manually by the authors to determine whether an IS sourcing theme was addressed by the study. Upon completion, both databases were merged and all those classifications resulting in conflict were reexamined and jointly classified after discussion. This process excluded several articles on the basis of relevance. 1,883 articles with 20,875 keywords were rendered from the initial filtering process; however, some of these keywords were not subsequently associated with any particular IS construct. Every keyword in an article was extracted, normalized and imported into a Microsoft Access 2010 database, keeping the unique article id to establish its origin. All blanks were eliminated. Table 2 provides a schema of the relevant fields used in the database. These fields were designed to capture descriptive information about the articles.

Short, Broberg, Cogliser and Brigham (2009) highlight deficiencies in text-based content analysis studies that lack content validity and recommends that a researcher should use deductive content validity. Among the steps to avoid this issue and validate the use of content-analysis methodology, the authors suggest the following steps to conduct this type of analysis: (1) Researchers should create a working definition of the constructs of interest using a priori theory when possible. (2) An initial assessment of construct dimensionalities to properly relate constructs should be conducted. (3) An exhaustive list of keywords should be developed, considering the proper terminology to relate constructs. (4) Word lists should be validated using

content experts to assess rater reliability, suggesting Holsti's (1969) method for assessing inter-rater reliabilities. (5) Commonly used words from narrative texts should be identified as synonyms of constructs using available software packages and the previous steps should be repeated to validate them. (6) Finally, the authors suggest the assessment of the terms' ability to predict theoretically related variables not captured via content analysis using regression or structural equation modeling.

TABLE 1. SELECTED JOURNALS

| Journal Name | Rank |
|---|-------------|
| MIS Quarterly | 1 |
| Information Systems Research | 2 |
| Communications of The ACM | 3 |
| Management Science | 4 |
| Journal of Management Information Systems | 5 |
| Decision Sciences | 6 |
| Harvard Business Review | 7 |
| Decision Support Systems | 8 |
| Information & Management | 9 |
| European Journal of Information Systems | 10 |
| IEEE Transactions on Software Engineering | 11 |
| IEEE Transactions on Knowledge & Data Engineering | 12 |
| IEEE Transactions on Parallel & Distributed Systems | 12 |
| Sloan Management Review | 13 |
| ACM Computing Surveys | 14 |
| ACM Transactions on Database Systems | 15 |
| Information Systems Journal | 16 |
| Data Base for Advances in Information Systems | 17 |
| IEEE Transactions on Computers | 18 |
| Journal of Strategic Information Systems | 19 |
| International Journal of Business & Management | 20 |
| Academy of Management Journal | 21 |
| International Journal of Social And Organizational Dynamics In Information Technology | 22 |
| Journal of Computer Information Systems | 23 |
| Organization Science | 24 |
| Academy of Management Review | 25 |
| Journal of the ACM | 26 |
| Journal of the Association for Information Systems | 27 |
| Administrative Science Quarterly | 28 |
| Journal of Global Information Management | 29 |
| International Journal of Information Management | 30 |

| | |
|---|----|
| International Journal of Human-Computer Studies | 31 |
| International Journal of Electronic Commerce | 32 |
| International Journal of Technology Management | 33 |
| Journal of Information Systems | 34 |
| Strategic Management Journal | 35 |
| Information & Organization | 36 |
| Journal of Information Technology | 37 |
| International Journal of Human-Computer Interaction | 38 |
| International Journal of Management Reviews | 39 |
| California Management Review | 40 |

TABLE 2. DATABASE SCHEMA

| Table | Fields |
|---------------|---|
| Articles | ArticleID, Authors, Title, Periodical, PublicationYear, Volume, Issue, StartPage, OtherPages, Abstract, AccessionNumber, Links, Description, Limitation, Methodology, Companies, Findings, Theories, GlobalIssues |
| Categories | CategoryID, Category, Tag, Subject |
| Keywords | ArticleID, Keywords |
| Authorship | ArticleID, Author |
| Relationships | ArticleID, Construct1, Construct2 |

Based on the recommendations of Short and colleagues (2009), we created an authoritative taxonomy of constructs by matching keywords as referents of specific construct dimensions found in the IS sourcing literature trend-analyses (Dibbern et al., 2004; Dedrick & Kraemer, 2009; King et al., 2009) along with the prominent textbook by Hirschheim et al. (2009) *a priori*. 20,875 keywords were analyzed for association with a particular construct. Specifically, keywords were examined to determine whether they matched a dimension of any IS sourcing construct, as defined earlier in this paper, as referents related to the behaviors, attitudes, outcomes, processes, experiences, manifestations and indicators connected with an organizational decision process to procure a supply of resources needed by an information systems process. As different constructs emerged in the analysis of keywords, the list was revised with the collaboration and approval of the authors; for disagreement in coding, a discussion was held to arrive to a consensus. A total of 142 constructs were used as the ultimate authoritative taxonomy list to which 11,991 from the 20,875 keywords were aligned. A few set of keywords that could refer to more than one construct were submitted for group discussion and the most relevant construct was used. Table 3 provides a sample of keywords that were determined to be referents related to certain IS sourcing constructs.

TABLE 3: CONSTRUCT REFERENTS

| Construct | Keyword/Referents |
|------------------|--------------------------|
| Contracts | Consulting contracts |
| Contracts | Contract Design |
| Contracts | Contract Duration |
| Ethics | Whistle-Blowing |
| Negotiations | Bargaining |
| Procurement | Web-based procurement |
| Procurement | Asset Acquisitions |
| Risk | Financial risk |
| Risk | IS risk management |

Relationships were subsequently created by establishing nodes with the constructs of each manuscript and creating relationship ties based on the common manuscript that tied them together. Database views were generated to examine the interrelationships between constructs, identifying a total of 22,858 dyads within the network of 1,883 articles. This number excludes those relationships that pointed back to the same construct such as keywords “IS risk management” and “financial risk”, which were both associated with “risk”, and thus one was eliminated.

Table 4 provides a sample of those relationship dyads discovered in the literature. It is important to note that relationships are symmetric; as such, relationships dyad duplicates were also eliminated.

TABLE 4. CONSTRUCT DYADS

| Construct1 | Construct2 | Count | PubYear |
|-------------------|-------------------|--------------|----------------|
| Outsourcing | Contracts | 26 | 2008 |
| Performance | Strategy | 15 | 2008 |
| Management | Contracts | 15 | 2008 |
| Offshoring | Contracts | 14 | 2008 |
| Contracts | Offshoring | 14 | 2008 |
| Industry | International | 14 | 2006 |
| Resources | Knowledge | 15 | 2005 |
| Strategy | Management | 14 | 2005 |
| Operations | Supply Chain | 14 | 2004 |

DESCRIPTIVE RESULTS

Trend Publication by Journal Tier

A descriptive analysis displays a growing trend in the number research studies conducted per year as well as a slight increment in the average number of authors per manuscript as time progresses. Figure 1 summarizes this trend; and, it displays the proportional contribution of articles based on their tier. The trend suggests a cumulative growth in publications over the last 20 years, as well as an increase in all the tiers for the exception of the second tier. This describes the significant growth in the interest surrounding sourcing issues.

FIGURE 1. TRENDS IN PUBLICATIONS BY JOURNAL TIER

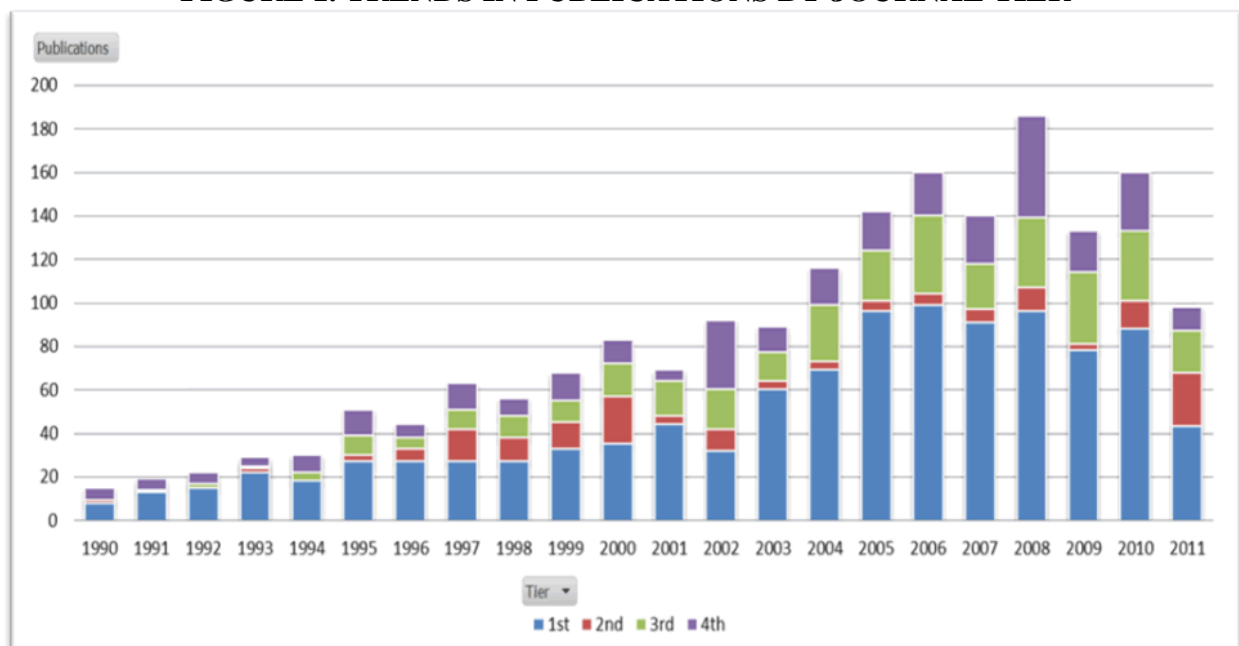


Table 5 provides a detailed summary of the IS sourcing studies published in each one of the journals grouped by their respective tier. This summary displays that Communications of the ACM, Journal of Management Information Systems, Harvard Business Review and MIS Quarterly are the top four journals in number of publications relating to IS sourcing. However, the journals with the highest slope of rising number of publications over time are Communications of the ACM ($\beta_{CACM} = 1.68$), Decision Sciences ($\beta_{DS} = 1.31$), Journal of Computer Information Systems ($\beta_{JCIS} = 0.77$), Journal of Management Information Systems ($\beta_{JMIS} = 0.70$). Sloan Management Review, on the other hand, shows a significant decline in its publication of IS sourcing related studies.

TABLE 5. TRENDS IN PUBLICATIONS BY JOURNAL AND TIER

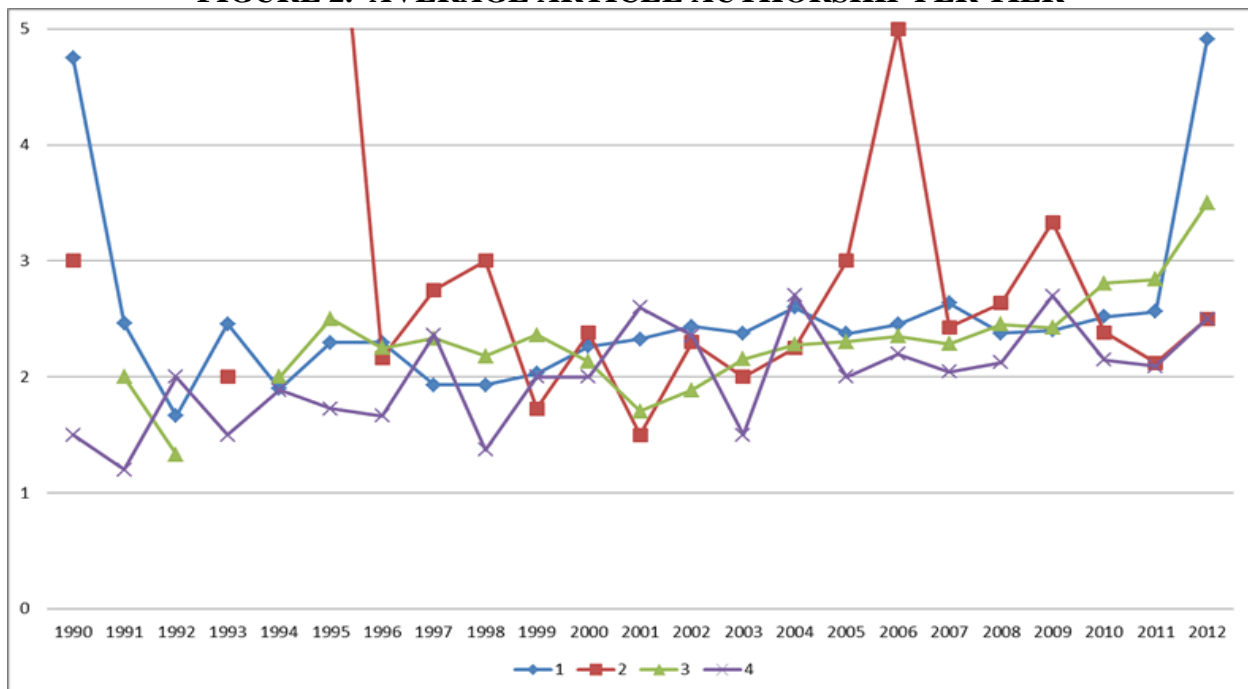
| Tier/Journal | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | Grand Total | |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|------------|------------|-----------|-----------|-------------|----|
| 1st Tier | 8 | 13 | 15 | 22 | 18 | 27 | 27 | 27 | 27 | 33 | 35 | 44 | 32 | 60 | 69 | 96 | 99 | 91 | 96 | 78 | 88 | 43 | 11 | 1059 | |
| MIS Quarterly | 2 | 4 | 1 | 5 | 4 | 3 | 4 | 8 | 7 | 5 | 5 | 4 | 6 | 9 | 6 | 14 | 14 | 11 | 20 | 10 | 9 | 5 | 7 | 163 | |
| Information Systems Research | | | 2 | | | 1 | | 2 | 4 | 1 | 2 | 2 | 4 | 3 | 7 | 4 | 9 | 2 | 3 | 5 | 2 | | | 54 | |
| Communications of The ACM | | | | | | | 5 | 1 | 3 | 8 | 7 | 9 | 5 | 17 | 23 | 14 | 25 | 27 | 17 | 19 | 24 | 6 | 2 | 212 | |
| Management Science | | | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 4 | 8 | 3 | 12 | 8 | 13 | 8 | 3 | 11 | 1 | 1 | 2 | | 87 | |
| Journal of Management Information Systems | 2 | 2 | 6 | 2 | 7 | 4 | 8 | 6 | 4 | 4 | 8 | 10 | 5 | 6 | 7 | 17 | 16 | 17 | 9 | 14 | 20 | 17 | | 191 | |
| Decision Sciences | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2 | 4 | 12 | 11 | 20 | 15 | 16 | 2 | | 91 | |
| Harvard Business Review | 4 | 7 | 2 | 14 | 5 | 16 | 7 | 7 | 6 | 9 | 8 | 7 | 7 | 6 | 16 | 18 | 11 | 8 | 12 | 7 | 5 | 7 | 2 | 191 | |
| Decision Support Systems | | | 1 | | | | | | | | | | | | 1 | 2 | 1 | 3 | 2 | 2 | 1 | 1 | | 15 | |
| Information & Management | | | | | | | | 1 | | 1 | 1 | 1 | 3 | 3 | 2 | 6 | 2 | 6 | 2 | 4 | 2 | 3 | | 25 | |
| European Journal of Information Systems | | | | | 1 | | 2 | 1 | 2 | 1 | 3 | 3 | 1 | 3 | 5 | 2 | 2 | 2 | 1 | 3 | 4 | | | 30 | |
| 2nd Tier | 1 | 2 | 2 | 3 | 3 | 6 | 15 | 11 | 12 | 22 | 22 | 4 | 10 | 4 | 4 | 5 | 5 | 6 | 11 | 3 | 13 | 25 | 4 | 166 | |
| IEEE Transactions on Software Engineering | | | | | | | | | | | | | | | | | | | | | | 1 | | 1 | |
| IEEE Transactions on Knowledge & Data Engineering | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 | |
| Sloan Management Review | 1 | | 1 | | 3 | 5 | 13 | 10 | 6 | 14 | | | | | | | | 1 | | | | | | 53 | |
| ACM Computing Surveys | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | |
| ACM Transactions on Database Systems | | | | | | | | | | | | | | | | 2 | | | | | | | | 4 | |
| Information Systems Journal | | | | | | | 1 | 1 | 4 | 7 | 4 | 6 | 3 | 3 | 3 | 2 | 5 | 11 | 2 | 2 | 2 | 2 | | 56 | |
| Data Base for Advances in Information Systems | | | | | | | | | | | | 2 | 1 | 1 | | | | | | | | | | 7 | |
| Journal of Strategic Information Systems | | | 1 | | | | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | | | | | | | | | | 14 | |
| International Journal of Business & Management | | | | | | | | | | | | | | | | 2 | 1 | | | | | | | 28 | |
| 3rd Tier | 1 | 2 | 1 | 4 | 9 | 5 | 9 | 10 | 10 | 15 | 16 | 13 | 18 | 13 | 26 | 23 | 36 | 21 | 32 | 33 | 32 | 19 | 1 | 336 | |
| Academy of Management Journal | | | 1 | | 1 | 1 | 2 | 1 | 3 | 6 | 1 | 2 | 3 | 4 | 5 | 3 | 4 | 5 | 3 | 4 | 6 | 4 | 5 | | 52 |
| Journal of Computer Information Systems | | | | | | 1 | | | 5 | 3 | 5 | 7 | 5 | 10 | 8 | 11 | 13 | 10 | 4 | | | | | 85 | |
| Organization Science | | | | | 1 | 3 | 1 | 2 | 5 | 8 | | 7 | 1 | 4 | 5 | 4 | 3 | | | | | | | 45 | |
| Academy of Management Review | 1 | | | | 1 | | 2 | 1 | 3 | 1 | 4 | 5 | 2 | 1 | 1 | 1 | 1 | 5 | 3 | 1 | 2 | | | 34 | |
| Journal of the Association for Information Systems | | | | | | | | | | | | | | | 3 | 9 | 5 | 10 | 4 | 8 | 6 | 13 | | 63 | |
| Administrative Science Quarterly | | | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 4 | 2 | | | | | | | | | | | | | 17 | |
| Journal of Global Information Management | | | | | | | | 3 | | | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 3 | 1 | 3 | 1 | | 20 | |
| International Journal of Information Management | | | | | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 2 | 3 | | | | | | | | | 20 | |
| 4th Tier | 6 | 5 | 5 | 4 | 8 | 12 | 6 | 12 | 8 | 13 | 11 | 5 | 32 | 12 | 17 | 18 | 20 | 22 | 47 | 19 | 27 | 11 | 2 | 322 | |
| International Journal of Electronic Commerce | | | | | | | | 2 | | 1 | 1 | 9 | 4 | 6 | 2 | 1 | 1 | 4 | 3 | 6 | | | | 40 | |
| International Journal of Technology Management | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | 9 | |
| Journal of Information Systems | 1 | 1 | | | | | | 2 | 1 | 4 | 1 | 7 | 1 | 1 | 3 | 7 | 7 | 7 | 4 | 3 | 1 | 2 | | 32 | |
| Strategic Management Journal | 1 | 3 | 2 | 2 | 3 | 5 | 5 | 1 | 2 | 2 | 2 | 2 | 1 | 3 | 7 | 7 | 7 | 14 | 7 | 9 | 2 | | | 85 | |
| Information & Organization | | | | | | | | | | | | | | | 1 | | | | | | | | | 1 | |
| Journal of Information Technology | | | | | | 4 | | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 8 | | | | | 28 | |
| International Journal of Human-Computer Interaction | | | | | | | | | | | | | | | 1 | 1 | 2 | | | | | | | 5 | |
| International Journal of Management Reviews | | | | | | | | | | 3 | 1 | 4 | 2 | 1 | 1 | 1 | 4 | 3 | 2 | 1 | | | | 22 | |
| California Management Review | 5 | 1 | 2 | 2 | 4 | 3 | 1 | 5 | 5 | 7 | 1 | 2 | 8 | 4 | 4 | 6 | 6 | 5 | 9 | 4 | 10 | 4 | 2 | 100 | |
| Grand Total | 15 | 19 | 22 | 29 | 30 | 51 | 44 | 63 | 56 | 68 | 83 | 69 | 92 | 89 | 116 | 142 | 160 | 140 | 186 | 133 | 160 | 98 | 18 | 1883 | |

It is important to highlight that certain journals did not show any relevant publications in connection with IS sourcing and were not displayed in the table. Finally, certain newly created publications, such as the International Journal of Business & Management, display a high slope in their focus of IS sourcing studies.

Average Authorship per Article by Journal Tier

An analysis of the collaboration among IS sourcing authors reveals that there has been an overall increase in the average authorship per article. A simple linear regression reveals a slight positive change across time ($\beta_{\text{authorship}} = 0.0223$, $R^2 = 0.4914$), moving from a 1.9 authors per article to 2.5 article. However, such collaboration trend does not hold for different journal tiers. While tiers 1, 3 and 4 have similar slopes, (.024 - .036), tier 2 has a negative and more erratic trend line suggesting a moderation effect based on the journal tier ($y = -2E^{-05}x^6 + .0018x^5 - .0595x^4 + .9756x^3 - 8.3395x^2 + 34.139x - 47.103$, $R^2 = 0.50$).

FIGURE 2. AVERAGE ARTICLE AUTHORSHIP PER TIER



New Authorship over Time

A descriptive analysis displays a growing trend in the number of research studies conducted per year by previously published authors on the subject; as well as a slight decrease in the percentage of new authors in this field. Figure 3 summarizes this trend which ignores the first 5 years of IS sourcing publications to establish a pattern. This 5 year window was suggested to provide sufficient time to establish prior history of publications in the field. This general trend follows the same patterns across tiers. Even though the IS sourcing research has increased over the last 25 years, new authorship has decreased consistently over this period.

FIGURE 3. NEW AUTHORSHIP OVER TIME

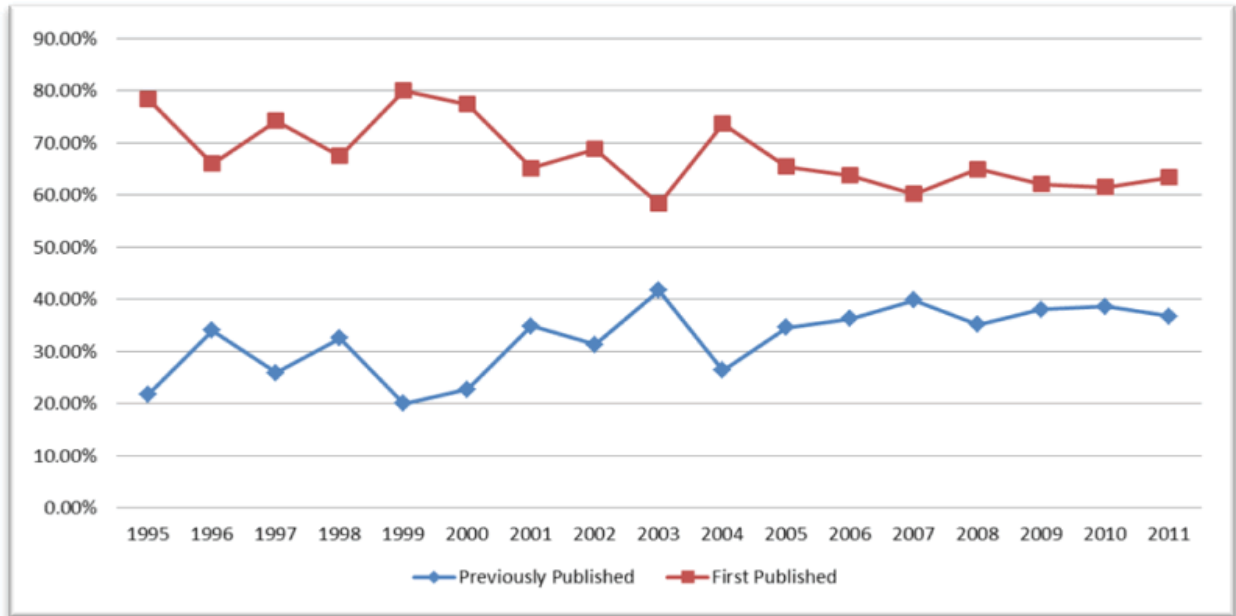


Table 6 lists the 25 most prolific authors in IS sourcing which have authored almost 20% percent of all the literature in the last 20 years. These authors are also the most active writers in the 2 top tiers attesting to the depth and scope of their contribution to the field of IS sourcing.

TABLE 6. MOST PROLIFIC AUTHORS IN IS SOURCING

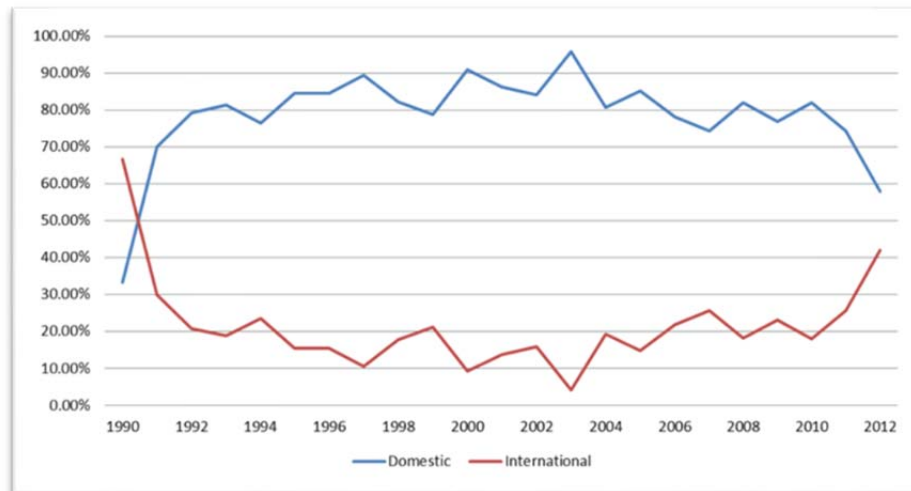
| Author | Contributions |
|---------------------|----------------------|
| Kauffman,Robert J. | 1.7% |
| Clemons,Eric K. | 1.6% |
| Willcocks,Leslie P. | 1.5% |
| Zwass,Vladimir | 1.2% |
| Grover,Varun | 1.0% |
| Lacity,Mary C. | 0.9% |
| Hirschheim,Rudy | 0.8% |
| Kraemer,Kenneth L. | 0.8% |
| Straub,Detmar W. | 0.8% |
| Fitzgerald,Guy | 0.7% |
| Keil,Mark | 0.7% |
| Rai,Arun | 0.7% |
| Rao,H. R. | 0.6% |
| Ang,Soon | 0.6% |
| Tiwana,Amrit | 0.6% |
| Kern,Thomas | 0.5% |

| | |
|---------------------|------|
| Lee, Jae-Nam | 0.5% |
| Markus, M. L. | 0.5% |
| Whinston, Andrew B. | 0.5% |
| Hitt, Lorin M. | 0.5% |
| Levina, Natalia | 0.5% |
| Porter, Michael E. | 0.5% |
| Sarker, Suprateek | 0.5% |
| Saunders, Carol S. | 0.5% |
| Zmud, Robert W. | 0.5% |

International vs. Domestic Scope in IS Sourcing Articles

A descriptive analysis of the domestic versus international scope of research in IS sourcing studies reveals a 6-power polynomial trend. Original studies in IS sourcing placed most attention in international research settings; this international trend receded over the years, but it is once gaining proportion, especially during the last 4 years. While only 20% of the studies had an international research setting in 2008, more than 40% used international settings in 2012. Figure 4 displays this trend over the last 20 years.

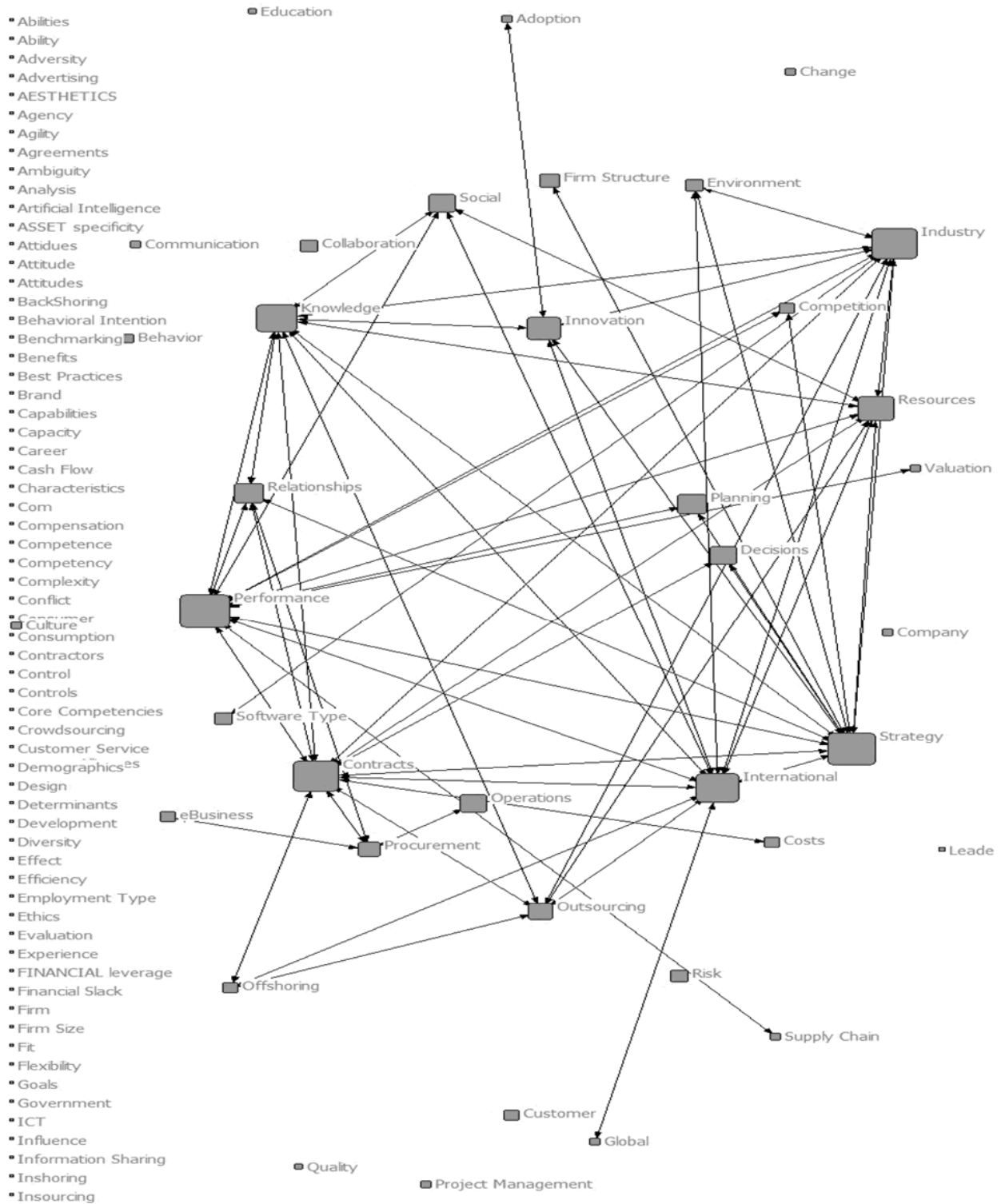
FIGURE 4. SCOPE OF INFORMATION SYSTEMS SOURCING ARTICLES



NETWORK ANALYSIS RESULTS

Given the network relationship approach of this study, we borrowed the methodology used by Parra, Han, Peters and Vidyarthi (2012) and constructed a matrix of the IS sourcing construct dyads that were most salient over the last twenty years or research (Figure 5). We further borrowed from this methodology and used UCINET 6.0 as a method of analyzing construct relationships in order to obtain evaluation of power centrality and adjacency measures. The most predominant relationships and the most recent trends are highlighted in the next section.

FIGURE 6. IS SOURCING CONSTRUCT RELATIONSHIPS: NETWORK DIAGRAM (STRONGEST NODES)



The literature has focused on capturing relevant components of planning, contractual agreements and effects of international settings in IS sourcing decisions that will be further explained in the following section. Figure 6 provides a map of relevant and powerful network nodes that influence other constructs in Information Systems sourcing. Specifically, figure 6 displays constructs (nodes) that have at least 20 different connections (vectors) with other constructs in the literature across the period of time that was observed by this study, suggesting constructs with stronger network influences in IS sourcing studies.

Salient Contributions in the Literature

Based on previous analysis, seminal papers will be highlighted to explain the most important IS sourcing dynamics that were examined in the literature over the last 20 years.

- Strategy & Performance
- Strategy & Planning
- Contracts & Outsourcing
- Strategy & Management
- Strategy & Industry
- Strategy & International Settings

DISCUSSION

The current study provides valuable information on the growing importance of the study of hypothetical concepts connected with an organizational decision process to procure a supply of resources needed by an information systems process, otherwise known as Information Systems Sourcing constructs. The increased attention is particularly relevant for the top tier of journals described in this study. This suggests that the issues surrounding the decision process and outcomes related to IS sourcing is far from settled. The network analysis of IS sourcing construct dyads found in the literature revealed that a company's strategy is the most salient construct, particularly its interaction with performance, planning, management, industry and international settings. The analysis also provides the critical value of different dimensions of contract issues in outsourcing scenarios. However, the literature has focused greatly on justifying the economic value and performance outcomes of sourcing decisions, in concurrence with other trend analyses done in this field.

One of the main research question that this study aims to answer is the effect of culture on IS sourcing decisions. The study reveals that less than 1% of the studies explored culture and its effects, focusing mainly—and just recently—on the relationship between culture and other constructs such as knowledge, management, behavior, contracts and behavior. This reveals a significant gap in the literature that deserves special attention. Another major gap in the literature that has recently caught more attention is the role of social, economic and environmental institutions in international settings.

The study also serves to show that certain venues are most fertile in the area of IS sourcing, revealing Communications of the ACM, Journal of Management Information Systems, Harvard Business Review and MIS Quarterly as the top four journals in number of publications.

Interestingly, these four journals are all part of the top tier, further validating its relevance with competing subjects. The analysis also showed one significant journal declining its interest in the field which merits feedback from the senior editors. In addition, this study suggests a slightly growing trend in the average number of collaborating authors in this field. In our opinion, the complexity of the issues merits such collaboration to attain publication in increasingly competitive venues. Our analysis highlights that while the scope of research in this field originated mostly in international settings, such scope changed drastically over time to focus on domestic settings only to refocus on international settings. This is particularly the case in the last four years, which underscores the importance of international events and their effects on otherwise “settled” assumptions.

LIMITATIONS

This study is based mainly on the accuracy of keywords provided by authors as referents of construct dimensions. As such, it is possible that the keywords listed on each one of the articles used for this study might not accurately or sufficiently reflect all the constructs discussed in them due to space limitations or frugality. In addition, as with any content-analysis study, the accuracy of the alignment of keywords with dimensions of constructs found in the literature. We aimed to minimize this error by using strong literature grounding to align keywords. In addition, this study uses indistinguishable dyad relationships assuming a homogenous nature of the construct members. However, dyadic relationships of constructs in the literature are mostly suggested to be formed of antecedent-outcome pairs; thus, this study ignores distinguishability and the implications of their nature. We suggest that given that is common to find the direction of such relationships solidly established in the literature, it is possible to establish the dyads first and then reflect their causality *a posteriori*. Finally, the nature of information systems is intertwined with business strategies; as such, it is possible that this study captures literature that addresses general issues that include information systems.

CONCLUSION

The main purpose of this study was to provide an examination of the relationships prevailing in the Information Systems Sourcing literature published within the last twenty years and to build on previous trend analyses in the field. Our overall results provide an extensive mining database that may be dissected and aggregated in multiple dimensions to provide further insight of this global phenomenon. The second stage of this study will include a literature review of those salient relationships and the intricacies identified through this analysis, which will be included by the time of the conference. Given the recent contributions to these areas, it would be prudent to organize such knowledge for practitioners and scholars alike. The trends identified through this study will emphasize the critical influence of certain constructs. We believe that our results expand on previous research by displaying the interaction of constructs presented in our dyads. This will provide further understanding of the interactions that are relevant to applied global information systems sourcing.

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