Communications of the Association for Information Systems

Volume 8 Article 27

May 2002

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Recommended Citation

Chua, Cecil; Cao, Lan; Cousins, Karlene; Mohan, Kannan; Straub, Detmar; and Vaishnavi, Vijay (2002) "IS Bibliographic Repository (ISBIB): A Central Repository of Research Information for the IS Community," Communications of the Association for Information Systems: Vol. 8, Article 27.

DOI: 10.17705/1CAIS.00827

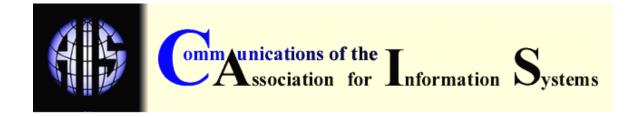
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IS Bibliographic Repository (ISBIB): A Central Repository of Research Information for the IS Community

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IS BIBLIOGRAPHIC REPOSITORY (ISBIB): A CENTRAL REPOSITORY OF RESEARCH INFORMATION FOR THE IS COMMUNITY

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ABSTRACT

The IS Bibliographic Repository (ISBIB), a central repository of Information Systems citations and author information, is a shared resource for research and researcher assessment that can support multiple streams of research. The goal of the repository is to capture research citations and other valuable information from all sub-cultures and disciplines within the international IS community, thereby providing a balanced perspective on the state of art in IS research. This repository should lead to a better understanding on the scope and objectives of IS research in general.

The repository also aims to be an unbiased data source for bibliometric research, and studies on IS research methods and processes. It currently holds systematic information about 92 journals. In the spirit of community development, the repository is available to the entire IS community, free of charge. This article describes the current state of the repository and invites readers to use it both for their own research and for bibliometric analysis. Because the repository is intended to be a reflection of the global IS community, the authors, who are also its maintainers, encourage IS researchers and journal editors to provide bibliographic information to extend the repository's usefulness

KEYWORDS: bibliometrics, IS research, gathering bibliographic data, IS research productivity, citation analysis, IS communities

I. INTRODUCTION

The Information Systems (IS) research community was characterized as a fragmented adhocracy by Banville and Landry [1989]. Researchers in the discipline can be distinguished not only by their geographic locale [Avgerou et al., 1999] and institutional characteristics [Lending and Wetherbe, 1992], but also by their personal preferences for specific methodologies, topics, and reference disciplines [Culnan, 1986, Culnan, 1987, Teng and Galletta, 1991].

Fragmentation creates at least two abiding problems for the profession:

- Fewer opportunities for diverse IS research groups to appreciate knowledge generated by each other [Eom et al., 1993].
- Difficulty in evaluating the state and progress of IS research objectively [Athey and Plotnicki, 2000].

To overcome these problems, researchers at Georgia State University (GSU) developed the IS Bibliographic Repository (ISBIB), a central repository of information systems bibliographic information open and available free of charge to all IS researchers. The repository is intended to serve community building by capturing the diversity of research perspectives in the field. Besides serving as an aid in literature reviews, the repository is intended to assist in bibliometric analysis, i.e., the quantitative analysis of bibliographic information, co-citation analysis, and studies on research productivity [Athey and Plotnicki, 2000, Bradbard and Niebuhr, 1987, Ellis et al., 1999, Im et al., 1998, Jackson and Nath, 1989, Lending and Wetherbe, 1992, Remus, 1991, Shim and English, 1987, Shim et al., 1991, Trieschmann et al., 2000, Trower, 1995, Van Over and Nelson, 1986, Vogel and Wetherbe, 1984]. The frequent publication of such research in scholarly IS journals is testimony of its value to the IS community.

The repository is also intended to serve as a living document to track the evolution of IS as a research discipline. As the repository captures the emergence of new journals, methodologies, and topics in the IS literature, future researchers can examine the repository to understand cultural and other factors that influence how the discipline grows. Such an understanding is especially important to ward off criticism from outside the IS community [Phelan, 2000]. In essence, we should be able to defend our own research perspectives better through understanding who we are.

The essential infrastructure of the repository, including architecture development, initial data capture, and system development is complete. The repository itself can be found at http://readable.eci.gsu.edu:8080/examples/servlet/isbib. Researchers are invited to test the repository and provide feedback so that the tool can be enhanced to meet the research needs of the entire community.

The remainder of this paper is organized as follows. In Section II, we motivate the need for a repository of IS bibliographic information through a review of the present state of the IS discipline and existing repositories. Section III presents the evolution of ISBIB and highlights some of its notable features. Section IV shows how the repository alleviates many of the problems identified. Section V presents work that is still outstanding and suggests how various stakeholders in the IS community can participate.

II. STATE OF THE IS DISCIPLINE

DIVERSITY IN IS RESEARCH

Not only is research in the information systems discipline characterized as fragmented and diverse, it is also accused of suffering from an identity crisis [Banville and Landry, 1989, Benbasat and Weber, 1996, Khazanchi and Munkvold, 2000, Robey, 1996]. This fragmentation in the discipline occurs at multiple levels:

- 1. regional,
- 2. institutional and
- 3. personal.

Regional

IS academics adopt distinct attitudes towards research across countries and geographical regions. For example, European IS researchers lean toward interpretivist work, while North American IS researchers tend to prefer positivist research [Avgerou et al., 1999, Benbasat and Weber, 1996, Evaristo et al., 1992, Straub et al., 1994]. Relevance is of greater interest to Europeans while rigor resonates with the North American research tradition [Benbasat and Weber, 1996]. As a result of these distinguishing characteristics, European researchers

target different premier quality journals than North Americans [Avgerou et al., 1999, Mylonopoulos and Theoharakis, 2001].

Institutional

This divergence of attitudes towards research, however, is not explained solely by geographical factors. Institutions within the same country or region often adopt separate standards for research evaluation. Institutions weight the importance of knowledge creation and knowledge dissemination differently [Trieschmann et al., 2000]. Institutions that regard knowledge creation highly also disagree on the relative merits of various knowledge contribution outlets (e.g., compare [Avgerou et al., 1999, Bradbard and Niebuhr, 1987, Clarke, 1995, Dutch Royal Society, 1996, GSU CIS Department, 1996, Hardgrave and Walstrom, 1997, Houston, Undated, Robey, 1995, Shim, 2001, Shim and English, 1987]).

Each IS institution favors particular research methodologies. Teng and Galleta [1991] discovered, for example, that most IS academic institutions focus exclusively on at most two of the eight most popular methodologies (surveys, case studies, subjective/argumentative, lab experiments, field experiments, engineering, empirical work, and theorem proof).

Personal

Besides the diversity resulting from geographic and institutional factors, IS researchers themselves exhibit professional diversity in their choice of methods. IS researchers employ at least eight distinct research methodologies (detailed above) [Teng and Galletta, 1991, Vaishnavi, 1999, Vogel and Wetherbe, 1984], draw knowledge from at least seven separate reference disciplines (organizational science, psychology, management science, economics, architecture, anthropology, and computer science) [Bakos and Kemerer, 1992, Baskerville and Myers, 2002, Benbasat and Weber, 1996, Cohen, 1999, Teng and Galletta, 1991], and conduct research in at least nine¹ research streams [Culnan, 1986]². In that a universally accepted definition of IS that unambiguously distinguishes IS research from its contributing disciplines has not yet emerged, it is likely that the number of methodologies, reference disciplines, and research streams is underestimated.

This picture of fragmentation suggests two outstanding issues for IS research. First, most IS researchers are unaware of related research in other paradigms. Schmidt et al. [2001] discovered, for instance, that while software project management and IS implementation research streams both dealt with project risk, little carries over from one sub-field to the other. Second, IS research conducted by small teams tends to be biased by the team's own methodological, geographic, reference discipline, and intellectual-historical sub-cultures. Gopal and Prasad [2000] argue, for example, that existing GDSS researchers tends to over-rely on quantitative methodologies and focus excessively on technology as the primary independent variable of interest.

EXISTING REPOSITORIES

None of the existing repositories, subscription-based or otherwise, focuses on the IS discipline, and thus addresses these concerns. In addition, most of these repositories only index the more established, premier journals, and do not index the smaller, emerging journals, or the highly topic specific ones. Table 1 lists some of the existing repositories, and their areas of coverage.

¹ These numbers were found 10 to 15 years ago. Ample evidence exists that they increased since then [Benbasat and Weber, 1996].

² The research streams in Culnan [1986] were identified through a cluster analysis of existing research. Thus, not all research streams were given names. The ones with names were Foundations/Management Theory, Systems Science, Computing Impacts/Local Government, MIS/DSS Implementation, Individual Differences, Human Factors, and Computer Conferencing. Two factors were not given names.

Table 1. Representative Existing Repositories

Repository	Coverage
CARL Uncover [CARL Corporation, 2001]	Captures a number of prominent European journals such as the European Journal of Information Systems, but does not capture such journals as MISQ, or ISR.
Collection of Computer Science Bibliographies [Achilles, 2001]	Stores computer science bibliographies contributed by volunteers. The information in this repository is collected as BibTeX files organized by topic. As a result, non-technical topics are not represented.
Database and Logic Programming Bibliography (DBLP) [Ley, 2001]	Addresses research of relevance to the database community. While major technical IS journals such as most ACM and IEEE Transactions are represented, other major journals such as ISR, and MISQ are not.
EBSCOHost [EBSCOHost, 2001]	Commercial repository that addresses research of relevance to the business research community. Most journals in this repository are focused on behavioral and organizational issues. Most of the technical journals are not represented here.
HCI Bibliographic Repository [Perlman, 2001]	Only captures research relevant to human-computer interaction. Example journals include the International Journal of Human-Computer Studies, the International Journal of Human-Computer Interaction, and ACM Transactions on Human Computer Interactions.
Felix Tan's EndNote Resources [Tan, 2001]	A public-domain, topic specific repository. This repository tends to be focused towards the behavioral and organizational topics.
Nelson H. F. Beebe's Bibliographies [Beebe, 2001]	A public access repository captures information on many of the premier technical journals. However, all data is presented in raw ASCII (actually BibTeX) format by journal, making it difficult to query.
Proquest [Bell and Howell Inc., 2001]	A commercial repository whose profile is similar to EBSCOHost
Publisher Digital Libraries	These libraries include the ACM and IEEE Digital Libraries, Elsevier Science Direct, the Springer-Verlag Digital Library, and others. The journals represented in these libraries tend to be from a single publisher.

ADDRESSING IS BIBLIOGRAPHIC CONCERNS

The ISBIB is proposed as a means for addressing some of the issues raised in Table 1. Specifically, the ISBIB is intended to:

- Facilitate examination of the entire range of IS literature. The repository is intended to be a resource for IS literature reviews. Specifically, it can facilitate literature reviews for:
 - (1) generic IS research,
 - (2) bibliometric IS research, and
 - (3) research on IS research.
- Improve understanding of Information Systems as a research discipline, and
- Record work that any subcommunity of the IS discipline considers to be research.

By exposing the body of our work to other IS subcommunities, the repository is designed to assist our subcommunities in understanding and appreciating one another. Knowledge sharing, in turn, will better inform discourse concerning the discipline. With greater

understanding, the IS community can better equip itself to understand and define its overall scope.

The repository also exposes IS research to other research communities. By making IS research more transparent, other research communities should be able to appreciate our work better.

These goals imply that the ultimate success of the repository hinges upon the active participation of all members of the IS community. While most of the work on the repository thus far involved a small group of doctoral students and faculty at Georgia State University, it is hoped that other members of the broader IS community will contribute, at least in updating the entries related to their own work.

III. ISBIB EVOLUTION AND FEATURES

The IS Bibliographic Repository is an operational reality. It can be found at http://readable.eci.gsu.edu:8080/examples/servlet/isbib. In this section, we describe how the repository evolved, and then present some of its notable features. More technical aspects of the repository design, including the database schema, are presented in Appendix II.

REPOSITORY EVOLUTION

The repository began as a way to improve understanding of the methodological diversity of the information systems community within Georgia State University (GSU). The GSU CIS department is unique in two ways:

- it is one of the largest CIS departments in the United States.
- it actively encourages methodological diversity both in its doctoral program [Vaishnavi et al., 1991], and in its faculty [Robey, 1995].

To understand and appreciate the plurality of topics and methodologies of interest to the department better, one of the authors (Chua) systematically collected data from most of the journals in the GSU target journal list [Robey, 1995]. This coauthor quickly realized that the collected data could possibly be useful to others. A request was broadcast on the CIS department's internal e-mail system, and a meeting of interested parties, including faculty and doctoral students was arranged.

At the organizational meeting, it was decided that the main goal of the project would be to develop a repository of bibliographic information that would be publicly available to the IS community and not proprietary to the GSU CIS department. The phases of the project were then mapped out, as shown in Figure 1. The architecture of the repository's database was specified, and bibliographic information was obtained from several sources including

- Proquest [Bell and Howell Inc., 2001],
- EBSCOHost [EBSCOHost, 2001],
- CARL Uncover [CARL Corporation, 2001],
- the Computer Science Bibliographies [Achilles, 2001],
- Nelson Beebe's bibliographies [Beebe, 2001],
- DBLP bibliographies [Ley, 2001],
- HCI Bibliographies [Perlman, 2001],
- Journal websites, and
- Journal announcements on ISWorld.

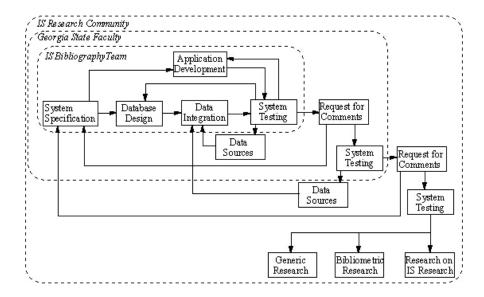


Figure 1. Project Workflow

Subsequent to the planning stage, applications were developed to leverage data within the repository, and to semi-automate the data gathering process. Because no budget was allocated to the project, tools for system development were selected from available, or public domain resources. Microsoft Access was chosen as the DBMS for the database, and Java and HTML were selected as the programming languages for web development. Tools built for other research projects were used to structure the initial prototype. When the initial data gathering, and application development processes were completed, the repository was opened for peer review within Georgia State University. Revisions obtained from the peer review process were incorporated into the repository.

At the same time, a team of doctoral students and one graduate assistant were assigned to clean the data. Data cleaning primarily centered on identifying whether authors identified in the repository as distinct were, in fact the same person. For example, Jay F. Nunamaker Jr., a highly prolific author, appeared separately as J. F. Nunamaker, J. Nunamaker, and J. Nunamaker Jr. The first round of data cleaning was completed in June 2001.

Since then, the authors worked to keep the repository current and useful. One of the authors (Chua) reviews the journals in the repository every six months to identify new journal issues to include. Whenever the authors can, they return to the repository to perform additional cleaning.

FEATURES

The repository supports features designed to serve the needs of the Information Systems researcher, and are, therefore, unique to the ISBIB.

Figure 2 presents the home page of the repository.

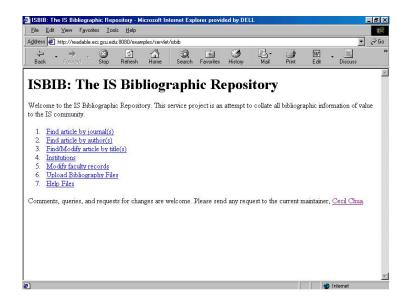


Figure 2. The IS Bibliographic Repository Home Page

The repository supports:

- **1. Complete Data -** The repository includes a diverse set of IS journals and articles not commonly included in other repositories, commercial or otherwise.
- **2. Common IS Research Activities -** The repository includes facilities to support online literature reviews. The repository can be queried by journal, author, title, abstract and keyword. In addition, if an article is available online (e.g., because it is on an author's web page, or in a digital library), the repository can be linked to the online article. Unlike most other repositories, ISBIB recognizes the varying compositional needs of IS researchers by allowing authors to export queries either to the EndNote or BibTeX bibliographic database formats.
- **3. Input from the IS Community** ISBIB enables users to recommend corrections to existing entries, or to identify articles not captured in the repository. This capability is in keeping with the viewpoint that the repository is a community project. Thus, the community should be allowed to contribute.
- **4. Administrative Functions** As an acknowledgement of administrator and contributor time constraints, facilities were developed to enable the administrator to add or modify existing data, both in batch mode and through an interactive screen. These import facilities are flexible enough to incorporate many import formats, making it easier for journal editors to provide such information to the administrator.

Database Features

Bibliographic information systematically gathered from 92 journals is already included in the repository. While the maintainers only perform two major updates a year, they also perform frequent minor updates. For example, information from new journal issue announcements on IS World are normally posted to the repository within 24 hours. As an illustration of how quickly the repository expands, by May 12, 2002 the repository stored information on 52,381 articles and 50,316 authors. Compare these figures with those of January 18, 2002 when the repository held information on 49,861 articles, 47,326 authors, and 412 institutions from 82 journals. Appendix I presents the 92 journals maintained in the ISBIB as of May 2002.

COMMON IS RESEARCH FACILITIES

The repository supports a standard set of bibliographic search features, including:

- queries by journal,
- · queries by author, and

queries by title, abstract, and keyword.

The querying by journal facility allows users to view bibliographic records as if they were browsing journals in a library. To perform a query, the user simply selects the journals to browse, and the date range of interest (Figure 3).



Figure 3. Query by Journal

Queries by author enable a user to identify all recorded works by one or more authors. To perform this query, the user selects the author's name (see Figure 4). If more than one author matches the user's query, the list of matching authors is displayed for the user to select among (Figure 5). A user may select more than one author.

Find Article by Author

Author	
First Name:	
Last Name: Grove	
Submit Query	

Figure 4: Query by Author

Select	Last	First	Change Data
	Grove	Adam J.	Change data
	Grove	Edward F.	Change data
	Grover	S. L.	Change data
	Grover	Varun	Change data
	Grover	Wayne D.	Change data
	Groves-Philips	S	Change data
П	Grovez	Adam J.	Change data

Figure 5: Selecting Authors

Finally, the query by title, abstract and keyword facility provides the user with a powerful flexible search facility to identify a specific article of interest. Figure 6 presents the query by title, abstract and keyword screen.

Irrespective of the query method employed, all ISBIB bibliographic output appears in an identical format (Figure 7). This output contains many options to enable further querying. For example, the user can click on the author's name. This generates a query of all of that author's journal publications. The user can also click on the title of an article, on the journal name, or on icons presented to the right of the article. These inquiries respectively generate the full bibliographic information on the article, query the journal, or download the article from the respective digital library. In the snapshot presented in Figure 7, the author could download the

Find Article by Title

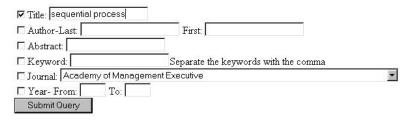


Figure 6: Querying by Title, Abstract and Keyword

M. Elizabeth C. Hull, R. M. McKeag, Communicating Sequential Processes for Centralized and Distributed Operating System Design.

ACM Transactions on Programming Languages and Systems. 6(2) April 1984. pp. 175-191

Abha Moitra, Technical Correspondence: On Apt, Francez, and de Roevers "A Proof System for Communicating Sequential Processes.

ACM Transactions on Programming Languages and Systems. 5(3) July 1983. pp. 500-501

Figure 7: Results of a query

article from the ACM digital library. Figure 8 presents an example of the full bibliographic information on an article

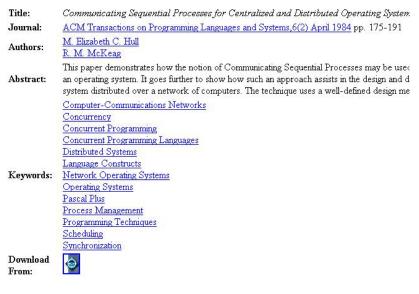


Figure 8. Full Bibliographic Information on an Article

Data in the IS Bibliographic Repository can be copied to a user's personal bibliographic databases. As researchers in the discipline use distinct authoring tools, the repository supports two of the bibliographic formats most commonly used by IS Researchers: EndNote, and BibTeX. Such data can be exported by selecting the relevant articles and export function in the query results screen (Figure 9). Authors that use other tools can request the creation of additional bibliographic export filters.



Figure 9. Export Functions in the IS Bibliographic Repository

Once the user selects an export option, the system generates a file on screen. Users should save the import file in text format, and then import it using their bibliographic database's import utility. For EndNote users, the Refer/BibIX import function should be used. BibTeX users can simply concatenate the export file with their existing database.

INPUT FROM THE IS COMMUNITY

Inasmuch as the database contains a large number of articles and authors, it is inevitable that much of the data in the database contains errors or is missing information. For example, in many cases, bibliographic information such as page numbers is missing. As discussed previously, the same author is often referred to in multiple ways. In addition, many important reference works are not captured, either because the team could not identify a convenient way to capture the journal's bibliographic information electronically, or because the team was unfamiliar with the journal.

The repository provides a feature for users to input corrections to the repository. For example, users can change data about author affiliation, or even an author's name by selecting the "Change data" link that appears next to an author in the search by author function (Figure 10).

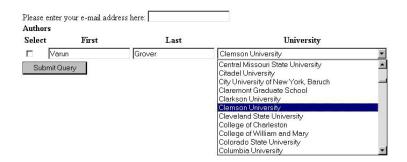


Figure 10: Changing Author Data

In Figure 10, for example, Professor Varun Grover would use the system to correct his institutional affiliation to Clemson University and submit the change [Click on "Submit Query"] to

the system. Users should be cautioned that for integrity and security, such corrections do not appear in the database immediately. Instead, they are added to a separate corrections table. The database administrator then approves each individual correction. Also, all changes must be identified with the e-mail address of the person requesting the change. Queries or concerns about amendments should be directed to the current administrator³.

ADMINISTRATIVE FUNCTIONS

Features are provided to aid the administrator. Specifically, four batch entry programs were developed to import files in various formats. The two commonly used batch entry programs import bibliographic data in BibTeX, and APA formats. A customizable batch program was also developed to facilitate the entry of bibliographic information posted on IS World. A fourth batch entry program is used to import changes made by users. Before using this batch entry program, the administrator reviews the existing change requests and flags them. The administrator can change the flag to approved, not approved, or temporarily uncertain. The default for all user requests and changes is temporarily uncertain. Once the administrator calls the batch entry program, the requests are modified in the following way:

- Approved requests are added to the database.
- Requests that are not approved are deleted.
- Requests considered temporarily uncertain remain unchanged.

The repository also indirectly supports the import of EndNote libraries. However, to import such libraries, they must first be exported to BibTeX format.

Since the ISBIB accepts data in the major bibliographic formats, it is easy for editors to provide bibliographic information of new articles whenever a journal issue is published.

Finally, the system includes a data entry screen to enter bibliographic information for individual articles. This screen is used to enter, for example, information about the articles of individual authors. Figure 11 presents the screen used to enter new articles. The "Not Official" flag is used to indicate that the entered data was not collected systematically from another source (e.g., journal website). This flag helps the administrator identify and delete duplicate articles.

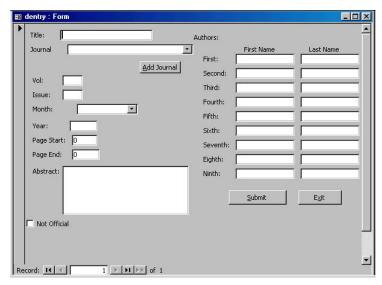


Figure 11. Entry Of New Articles

IV. ISBIB BENEFITS

The ISBIB benefits the IS research community in two ways:

³ At the time of publication, the administrator is this paper's first author.

- It facilitates three types of IS research: (1) research about information systems, (2) bibliometric research, and (3) studies about IS research.
- It increases shared understanding within the IS community by bringing research from the various subcommunities into a central repository for viewing and use.

The ISBIB not only helps subcommunities within the IS research community to comprehend the interests and work of the other subcommunities, but the improved understanding also strengthens the community when it is confronted with external threats.

RESEARCH FACILITATION

Research About Information Systems

ISBIB provides all interested IS researchers with a central repository of bibliographic information. Currently, IS researchers are limited by having access only to such topic-specific bibliographic repositories as the *ISWorld EndNote Library Resources* [Tan, 2001], the *Human-Computer Interaction Bibliography* [Perlman, 2001], *Proquest* [Bell and Howell Inc., 2001], EBSCOHost [EBSCOHost, 2001], and DBLP [Ley, 2001]. As valuable as these repositories are, they are restricted to the topics they support. By no means do they cover all areas being explored by IS researchers.

ISBIB already captures a more representative picture of IS research than other existing repositories.

Bibliometric Research

As a repository of IS bibliographic information, ISBIB provides a large, unbiased source of bibliometric data. Existing bibliometric information is obtained either by consulting the bibliographic repository of a reference discipline [Culnan, 1986, Culnan, 1987, Ellis et al., 1999], or by tracing citation information in articles in a few, well recognized journals [Athey and Plotnicki, 2000, Bradbard and Niebuhr, 1987, Im et al., 1998, Jackson and Nath, 1989, Lending and Wetherbe, 1992, Remus, 1991, Shim and English, 1987, Shim et al., 1991, Trieschmann et al., 2000, Trower, 1995, Vogel and Wetherbe, 1984]. The first approach produces results biased towards research framed in the reference discipline. The second approach produces results biased towards the geographical orientation, methodologies, and topics that the widely recognized journals support.

Studies About IS Research

The accuracy of research on IS research, especially on journal quality and researcher productivity is much debated [Athey and Plotnicki, 2000]. IS research institutions adopt different criteria to measure journal quality and research productivity. Often, these studies are biased against research framed in reference disciplines that encourage specialization. For example, several excellent articles in this area, such as Trieschmann et al. [2000] and Trower [1995] did not consider technical journal publications of IS researchers while others such as Athey and Plotnicki [2000] considered only a limited subset of top-tier technical journals.

ISBIB provides features to overcome this limitation:

- the repository offers a large set of journals for analysis.
- when available, the quality of journals recognized by institutions is identified within the repository.

At present, we believe only Georgia State University lists its estimate of journal quality. However, the capability to do so is provided for all institutions listed in the database. Once a representative sample of IS research institutions provide their list, the community can use the data (in conjunction with other sources) to evaluate journal quality better. ISBIB complements existing sources of journal quality information (e.g. Carol Saunder's Journal Information page [Saunders, 2001]) by providing information about ratings of journal quality by the individual institutions. Existing sources primarily provide aggregated information of journal quality derived from surveys. It is difficult to determine the universality of a journal's perceived quality level from these sources.

SHARED UNDERSTANDING

ISBIB includes bibliographic information about articles formulated from disparate reference disciplines using different methodologies, about distinct topics, from separate geographic locales. As a result, the ISBIB provides one avenue to help IS researchers appreciate the discipline's plurality.

As the repository increases in size and becomes ever more representative, it will also facilitate an empirical definition of the IS discipline. Communities are self-defined and in the case of IS, the most operational definition to date is the list of researchers who consider themselves to be part of the community by entering or correcting information on the ISWorld Faculty Directory service provided by the MIS Research Center at the University of Minnesota [http://webfoot.csom.umn.edu/isworld/facdir/default.htm] The repository performs complementary role by allowing the community to self-define IS research. Because all IS researchers can submit their articles to the repository, the scope of IS research is not constrained by the vision of a select group of individuals. On the other hand, the relevance of each journal to IS can be assessed independently by determining the frequency that IS academics publish in their pages. Also, an IS researcher must suggest journals for inclusion into the repository. Journals without advocates by definition would not be IS journals.

Such an empirical definition offered by the widespread use of ISBIB is important for administrative reasons. It should help protect IS academic departments from being absorbed by academic departments of related disciplines, and it should help tenure-track candidates justify the importance of their research. While IS now stands in a reasonably healthy position in most universities, there was a time when the relevance of IS as a research discipline was routinely questioned [Keen, 1980]. If we do not define our own discipline, others will define it for us [Phelan, 2000].

V. ISSUES OUTSTANDING

One final concern about ISBIB is its long-term viability. The ISBIB provides a clear benefit to all users. It provides a central resource for literature reviews, and an easily available database for bibliometric research. However, the benefits of the repository are averaged over thousands of IS researchers, while the costs of maintaining it are borne by a handful of volunteers. Currently, the maintenance level of the ISBIB is in line with other existing repositories. To our knowledge, no repository captures the latest articles in most journals, and frequently, entries can remain unchanged for a year. The ISBIB undergoes a major update twice a year.

To some degree, the costs of maintaining the repository are mitigated by the academic research culture, which expects its members to contribute services. Other existing academic bibliographic repositories such as the DBLP [Ley, 2001] and the HCI bibliographies [Perlman, 2001] are maintained by volunteers, just like the ISBIB. Similarly, many volunteers support various aspects of the IS community. For example, David Naumann supports the MISC-ISWorld Faculty Directory⁴ (https://ids.csom.imn.edu/isworld/facdir/default.htm),a list of IS faculty. Similarly, Felix Tan supports the IS EndNote Resource page [Tan, 2001].

However, service does not completely compensate for the costs of maintenance. As a result, major updates to ISBIB only occur twice a year. Thus, the most recent issues of journals are often not available. In some cases, where the maintainers do not have access to recent copies of journals, the entries are not updated at all.

Furthermore, while the maintainers would like to extend the repository to capture conference proceedings, books, book sections, and dissertations, the additional cost of development and maintenance is sufficiently prohibitive that such work has not commenced.

We believe the best approach to ensuring the long-term viability of the repository is to encourage more volunteers to work on the project. Specifically, AIS, journals, universities, and authors are invited to contribute their knowledge and expertise to this research.

⁴ The IS faculty directory was originally created at the University of Minnesota [DeGross et al., 1989]

AIS

Discussions were underway in mid-2002 to put the repository under AIS sponsorship. By placing the ISBIB under the umbrella of a representative institution, we ensure that it accurately reflects the perspectives and beliefs of the entire IS community.

JOURNALS

As the repository grows, it will not be possible for a small volunteer team of graduate students and faculty to keep the repository up to date. Editors of IS journals could take steps to ensure that information is accurate and up-to-date by providing bibliographic information on current issues of their journals. This resource especially requires bibliographic information from the editors of journals not found in the repository. The current list of journals is mostly reflective of the North American community, and, thus, the assistance of the international IS community in supplying missing information is requested.

INSTITUTIONS AND AUTHORS

The repository currently contains just under 50,000 articles and over 47,000 authors. It is not possible to search for contact information on all authors manually or verify that the repository is accurate. Institutions such as universities and research laboratories are encouraged to contribute their target journal lists, and information on their researchers, including home page and contact information. Target journal lists are classifications of IS journals by type and quality [Swanson et al., 1998]. They serve the purposes of tenure and promotion and of measures of IS researcher productivity. A typical target journal list, such as that used by Georgia State University (http://www.cis.gsu.edu/~dstraub/Research/TargetJournalList/Target%20Journals.htm),classifies journals by quality. "Premier" journals on the GSU list are equivalent to "A" journals, etc. Another option is to categorize by type, for example, scholarly as opposed to practitioner journals.

Authors are invited to visit the ISBIB website to identify errors and suggest corrections.

VI. CONCLUSION

The Information Systems Bibliographic Repository, a central, comprehensive repository of bibliographic information on IS research, was initiated as a resource for the entire IS community. This repository was developed to facilitate research in Information Systems and to help define the discipline empirically. Preliminary data gathering and application development is complete. Almost 50,000 articles currently appear in the repository. Remaining work includes additional data gathering, data cleaning, extending the repository to incorporate other forms of research such as conference proceedings, books, and book chapters, and mining the repository for insights on IS research directions and trends.

Members of the IS research community are encouraged to test and use the repository. The implementation team also actively encourages feedback from the community to improve the content and structure of the repository. In this way, a shared understanding of the Information Systems landscape can be fostered, one that crosses the methodological disciplines, geographic backgrounds, intellectual histories, and reference disciplines that currently fragment the IS community.

Editor's Note: This article was fully refereed. It was received on March 4, 2002. It was with the authors for three weeks for two revisions. It was published on May 22, 2002.

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APPENDIX I. JOURNALS REPRESENTED IN THE ISBIB (MAY 2002)

EDITOR'S NOTE: This table is updated in the Letter to the Editor at the end of this article, dated January 2003.

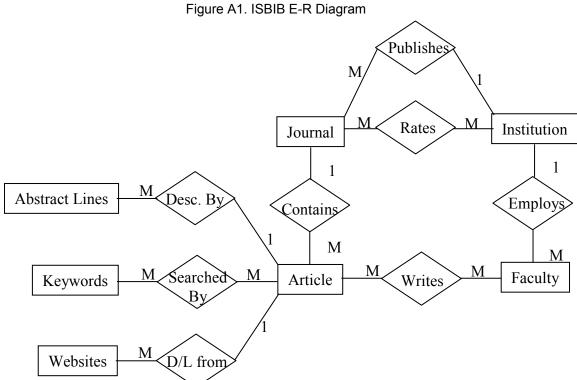
January	2003.		
Serial Number	Title	Years	Issues
1	Annals of Cases on Information Technology	1999-2002	1-4
2	Accounting, Management, and Information Technologies/Information and Organization	1991-2002	1:1-12:2
3	ACM Computing Surveys	1969-2002	1:1-34:1
4	ACM Letters on Programming Languages and Systems/ ACM Transactions on Programming Languages and Systems		1:1-23:5
5	ACM Transactions on Computational Logic	2000-2002	1:1-3:2
6	ACM Transactions on Computer Systems	1983-2002	1:1-20:1
7	ACM Transactions on Computer-Human Interaction	1994-2002	1:1-9:1
8	ACM Transactions on Database Systems	1976-2001	1:1-26:4
9	ACM Transactions on Design Automation of Electronic Systems	1996-2002	1:1-7:1
10	ACM Transactions on Graphics	1982-2002	1:1-21:1
11	ACM Transactions on Information and System Security	1998-2002	1:1-5:2
12	ACM Transactions on Information Systems/ ACM Transactions on Office Information Systems	1983-2002	1:1-20:1
13	ACM Transactions on Internet Technology	2001-2002	1:1-2:1
14	ACM Transactions on Mathematical Software	1975-2001	1:1-27:4
15	ACM Transactions on Modeling and Computer Simulation	1991-2001	1:1-11:3
16	ACM Transactions on Software Engineering and Methodology	1992-2002	1:1-11:2
17	Acta Informatica	1971-2002	1:1-38:4
18	Al Magazine	1980-2000	1:1-21:4
19	Artificial Intelligence	1983-2002	21:1-136:1
20	BIT	1980-1993	20:1-33:4
21	Communications of the ACM	1971-2002	14:1-45:2
22	Communications of the Association for Information Systems	1999-2002	1:1-8:24
23	Data and Knowledge Engineering	1986-2002	1:1-40:2
24	Decision Support Systems	1994-2002	
25	E-Services Journal	2001-2001	1:1-1:2
26	Electronic Journal on Information Systems in Developing Countries	2000-2002	1:1-9:1
27	Electronic Markets	1991-2002	1:2-12:2
28	European Journal of Information Systems	1995-2002	4:1-11:1
29	Group Decision and Negotiation	1995-2001	4:1-10:6
30	IEEE Computer	1974-2002	7:1-35:1
31	IEEE Computer Graphics and Applications	1981-2002	1:1-22:1
32	IEEE Computer Science and Engineering/IEEE Computing in Science and Engineering	1994-2002	1:1-5:4/1:1-4:3
33	IEEE Concurrency	1997-2000	5:1-8:3
34	IEEE Internet Computing	1997-2002	1:1-6:2
35	IEEE Micro	1981-2002	1:1-22:2

Serial			
Number	Title	Years	Issues
36	IEEE Parallel and Distributed Technology	1993-1996	1:1-4:4
37	IEEE Software	1984-2002	1:1-19:2
38	IEEE Transactions on Computers	1975-2001	24:1-50:9
39	IEEE Transactions on Engineering Management	1986-2002	33:1-49:1
40	IEEE Transactions on Evolutionary Computation	1997-2000	1:1-4:3
41	IEEE Transactions on Fuzzy Systems	1998-2000	6:1-8:5
42	IEEE Transactions on Knowledge and Data Engineering	1989-2001	1:1-13:6
43	IEEE Transactions on Neural Networks	1990-2000	1:1-11:6
44	IEEE transactions on parallel and distributed systems	1990-2001	1:1-12:9
45	IEEE Transactions on Software Engineering	1975-2001	1:1-27:9
46	IEEE Transactions on Visualization and Computer Graphics	1995-2001	1:1-7:4
47	IEEE/ACM Transactions on Networking	1993-2001	1:1-9:6
48	Information and Management	1995-2002	28:1-39:6
49	Information Management	2000-2000	13:3-13:4
50	Information Resources Management Journal	2001-2002	14:1-15:1
51	Information Society	1981-2002	1:1-18:2
52	Information Systems	1975-2002	1:1-27:3
53	Information Systems Frontiers	1999-2001	1:1-3:4
54	Information Systems Journal	1995-2002	5:1-12:2
55	Information Systems Research	1990-2002	1:1-13:1
56	Information Technology and Management	2000-2001	1:1-2:3
57	Information Technology and People	1993-2001	6:2-14:1
58	Informing Science	1997-2002	1:1-5:2
59	International Journal of Electronic Commerce	1996-2001	1:1-6:1
60	International Journal of Human Computer Interaction	1989-2001	1:1-13:4
61	International Journal of Man-Machine Studies/ International Journal of Human Computer Studies	1982-2002	16:1-56:2
62	Journal of Algorithms	1980-2001	1:1-41:1
63	Journal of Computer and System Science	1990-2001	40:1-63:2
64	Journal of Database Management	2000-2002	11:4-13:2
65	Journal of Educational Resources in Computing	2001-2001	1:1-1:2
66	Journal of Electronic Commerce Research	2000-2002	1:1-3:1
67	Journal of End User Computing	2000-2002	12:2-14:2
68	Journal of Experimental Algorithmics	1996-1999	1:1-4:1
69	Journal of Global Information Management	1993-2002	1:2-10:2
70	Journal of Global Information Technology and Management	1998-2002	1:1-5:2
71	Journal of Information Technology	1993-2000	8:1-15:4
72	Journal of Information Technology Cases	1999-2001	1:1-3:4
73	Journal of Information Technology Education	2002-2002	1:1-1:3
74	Journal of Information Technology Theory and Application	1999-2001	1:1-3:5
75	Journal of Information Warfare	2001-2001	1:1-1:2
76	Journal of Management Information Systems	1984-2002	1:1-18:4
77	Journal of Strategic Information Systems	1995-2002	4:1-11:1

Serial			
Number	Title	Years	Issues
78	Journal of the ACM	1954-2001	1:1-48:2
79	Journal of the American Society for Information Science	1990-2001	41:1-52:9
80	Journal of the Association for Information Systems	2000-2002	1:1-2:8
81	Journal of Strategic Information Systems	1991-2001	1:1-10:4
82	Knowledge and Information Systems	1999-2001	1:1-3:4
83	Logistics Information Management	1991-2001	4:1-14:3
84	Management Science	1988-2002	34:1-48:2
85	MIS Quarterly	1985-2002	9:1-26:1
86	Organization	1995-2001	2:1-8:2
87	Organization Science	1992-2001	3:1-12:2
88	Quarterly Journal of Electronic Commerce	2000-2000	1:1-1:2
89	SIAM Journal on Computing	1972-2001	1:2-31:1
90	The Database for Advances in Information Systems	1969-2000	1:1-31:1
91	VLDB Journal	1992-2001	1:1-10:4
92	World Wide Web Journal	1998-2001	1:1-4:4

APPENDIX II. CONCEPTUAL MODEL OF REPOSITORY DATABASE

In this appendix, we present a rudimentary Entity-Relationship (ER) diagram, and a brief description of the tables that currently make up the IS Bibliographic Repository. In some cases, table and attribute names were rewritten so that they correspond to entity and relationship names presented in the ER diagram and to maximize the reader's understanding of the design. For example, in the real database, the name of the Write table is Author, and the attribute 'title' in the article table is called 'article'. Certain attributes used by various modules in the repository for processing were also excluded from this appendix. Knowledge of such attributes is only valuable to the system's maintainer.



Abstract Lines: [Code, Order, Line]- Abstracts are stored by line. A line is defined as any string terminated by a period (.), exclamation point (!) question mark (?) or carriage return (i.e., next paragraph). This overcomes a limitation of the ODBC standard whereby only lines of less than 255 characters can be passed to an application.

Article: [Code, Title, JournalCode, Volume, Issue, MonthCode, Year, StartPage, EndPage, NotOfficial]- Note that there is no explicit functional relationship between volume, issue, month and year and the table is therefore in 5NF. Some journals do not have volumes, or issues while other journals will publish multiple issues in the same month.

DepartmentTypes: [DepartmentCode, Name]- This table is a system table and is not reflected in the ER Diagram.

Faculty: [FacultyNo, Last, First, DepartmentCode, InstitutionCode, Website, DatePhD, PhDInstitution]- Department and University denote the department and university of the author at the present time.

Institution: [InstitutionCode, Name, Logo, IsUniversity]- The logo is the name or URL of a graphic file depicting the institution's logo. Institutions include not only universities, but also publishers (e.g., ACM, IEEE, AIS).

Journal: [JournalCode, Title, InstitutionCode]

Keywords: [Keyword]- This table defines the list of acceptable keywords.

Modifications: [TableName, PrimaryKey, Attribute, ChangeType, RequestedBy, RequestDate, ChangeValue, Flag]- This table stores any and all requested modifications. ChangeType can either be addition, update, or deletion. If the primary key and the attribute field are the same, then the change request is for an entire record. Note that the primary key and attribute fields can store more than one attribute. If multiple attributes are stored, they are separated in the field by a comma.

Month: [MonthCode, MonthName]- Including 'Unknown', we have identified 37 distinct month codes used in journals. These include the traditional calendar months (e.g., 'January'), seasons (e.g., 'Spring'), and various combinations thereof (e.g., 'January/March').

Rates: [JournalCode, InstitutionCode, Rating]- This enables the repository to capture the ratings of the journals in each institution.

SearchedBy: [Code, Keyword]

Website: [Code, Website, Institution]- An article can be downloaded from more than one website. For example, the article could be stored in a digital library, and on the author's personal website.

Writes: [Code, FacultyNo, Order, DepartmentCode, InstitutionCode]- Order in this table denotes the author ordering. For example, in the cited paper by Benbasat and Weber [1996], Benbasat would be given an order of 1, while Weber would receive an order of 2. Department and University denote the department and university of the author at the time of publication.

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Lan Cao is a PhD student in Computer Information Systems at Georgia State University. She received a Masters of Science in Computer Information Systems from Georgia State University, and a Master of Science in textiles from the Georgia Institute of Technology. Her research interests include information system development, workflow management, and coordination theory.

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LETTER TO THE EDITOR

January 2003

IS BIBLIOGRAPHIC REPOSITORY: REVISED APPENDIX I

Cecil Eng Huang Chua

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The IS Bibliographic Repository (ISBIB) was updated as of December 2002. In Appendix I of the original publication, we identified 82 journals for which bibliographic information had been

archived. The IS Bibliographic Repository now archives bibliographic information on 112 journals of relevance to the IS community. Enclosed at the end of this letter is the revised Appendix I.

The IS Bibliographic Repository stores bibliographic information on journals of relevance to the IS research community. It was developed to foster community building and understanding within the community by presenting the research published by the various sub-communities. The repository is available free of charge at http://readable.eci.gsu.edu:8080/examples/servlet/isbib.

In the spirit of community building, researchers and editors of journals are requested to contribute bibliographic information. We especially encourage the identification of journals not currently in the list. However, we also solicit corrections/updates to existing journals. While EndNote or BibTeX are the preferred formats for submission, information to be included can be submitted in any standardized format (e.g., ASCII text in APA format). Corrections to entries in the repository can be made via the various "modify record" options in the repository. Alternately, requests can be submitted to the active maintainer at ae-hchua@ntu.edu.sg. The maintainers do not impose personal value judgements on the "relevance" of journals included. So long as some subcommunity of the IS community feels that a journal is relevant, we will include it.

More information on the IS Bibliographic Repository can be found in the article cited below. We request that researchers who employ the repository as data (e.g., bibliometric studies) cite this article.

Cecil Eng Huang Chua, Lan Cao, Karlene Cousins, Kannan Mohan, Detmar W. Straub Jr. and Vijay Vaishnavi. *IS Bibliographic Repository (ISBIB): A Central Repository of Research Information for the IS Community*. Communications of the AIS. 8(27) May 2002. pp. 392-412.

S/No	Title	Years	Issues
1	Accounting, Management, and Information Technologies/Information and Organization	1991-2002	1:1-12:4
2	Academy of Management Journal	1986-2002	29:1-45:5
3	Academy of Management Review	1986-2002	11:1-27:4
4	ACM Computing Surveys	1969-2002	1:1-34:4
5	5 ACM Letters on Programming Languages and Systems/ ACM Transactions on Programming Languages and Systems		1:1-24:5
6	ACM Transactions on Asian Language Information Processing	2002-2002	1:1-1:2
7	ACM Transactions on Computational Logic	2000-2002	1:1-3:4
8	8 ACM Transactions on Computer Systems 9 ACM Transactions on Computer-Human Interaction		1:1-20:4
9			1:1-9:4
10	ACM Transactions on Database Systems	1976-2002	1:1-27:4
11 ACM Transactions on Design Automation of Electronic Systems		1996-2002	1:1-7:4
12	ACM Transactions on Graphics	1982-2002	1:1-21:4
13	ACM Transactions on Information and System Security	1998-2002	1:1-5:4

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S/No	Title	Years	Issues
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105	Drganization Science	1992-2002	3:1-13:6
106	Quarterly Journal of Electronic Commerce	2000-2000	1:1-1:2
107	SIAM Journal on Computing	1972-2002	1:2-32:1
108	Sloan Management Review	1990-2002	31:2-43:4
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