

# Research applications in information management: the case of informetric research in Australia<sup>\*</sup>

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## **Abstract**

This paper describes the ways in which informetric research is useful to concerns in the field of library management and information service provision. The overview of informetric research applicable to LIS problems is set within the five challenges for LIS researchers as set out in a recent article by Michael Buckland (2003). Where possible reference is made to relevant informetric work conducted in Australia, by Australian researchers, or with Australian data. Findings from informetric research form an important background resource to add to or augment findings from investigations of problems in specific library environments or settings. Informetrics includes both quantitative and qualitative methods, and used in combination can provide a more rounded set of findings that has greater validity and is more for management and policy applications. Quantitative methodologies are generally based on bibliometric techniques, such as mining and analysis of data from various bibliographic and textual databases; qualitative methods include survey, case study and historical approaches. Used in combination, each set of findings adds richness and other perspectives to an analysis.

## **Introduction**

In his article about the challenges for library research, Michael Buckland emphasises the importance of gaining deeper understanding of important, but inadequately understood, phenomena that might improve library service, theory, design, or values, or for library communities that require and use information (Buckland, 2003, p.675). This paper addresses the way informetric research has contributed to several of these challenges: to issues in provision of library service and to the theory of informetrics; and to understanding more about communities of readers and library users, and communities of researchers, writers (authors), and publishers who read, create and use the specialist and scholarly literatures.

Informetric research is one of the fields that focus on understanding how specialists (i.e. communities of interest) build the discourse pertaining to specific communities through use of language, through writings and through specific communication channels, both formal and informal. The examination of the formal channels of communication among scholarly communities provides insights into what is read or used, preferences in printed media (journals, books and monographs), and in electronic media, (databases, and through Internet sites). Such research identifies the range of journals that cover certain topics or fields

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and describes the boundaries of specific literatures and domain-based literatures (albeit at a certain point in time). Informetrics of this kind can begin to answer such complex questions as how and why specialties arise, expand and wither; and where the boundaries of fields intersect with that of another field or discipline. In an era of more selective collection development, understanding the use of materials within various scholarly communities (for example, what is core, and what is peripheral; the extent of or limits to use of informational materials), is important input for collection management.

## Informetrics: what is it?

The term informetrics has come into greater prominence and usage over time from its earliest usage in the 1970s. A historical discussion of this term is provided in Wilson (1999). It is now mainly used as a generic term that covers all quantifiable aspects of information science and includes bibliometrics, scientometrics and citation analysis, as well as aspects of related fields with which it exchanges information, such as information retrieval theory and scholarly communication studies. For this paper, informetrics is taken in its broadest meaning – to encompass the measurement of information, from its scientific production, publication, its use, and networks of scholarly communication. The following section illustrates the strong connection between informetric research and library-related applied research by the bibliometric analysis of the literature described below.

### **Literature dynamics of informetrics vis-à-vis LIS**

To illustrate the interplay between informetrics and LIS, we conducted a search of the three citation databases of the Institute of Scientific Information (*Science Citation Index*, *Social Science Citation Databases* and *Arts and Humanities Citation Index*). The result of this small bibliometric analysis provides a view of the growth of the literature of informetrics vis-à-vis the broad aspect of Library and Information Science (LIS).

### **Method**

The Dialog<sup>i</sup> search set for informetrics is: ‘bibliometr? or informetr? or scientometr? or citation (3n) analys? or webometric? or netometr?’, while that for broad aspects of LIS is: ‘librar? or (digital (3n) collection?) or (core (3n) journal? or serial?) or (journal (3n) evaluation?) or (journal? or serial? (3n) acquisition?).’<sup>ii</sup> The two sets were intersected and duplicates removed. The final set yielded 1343 documents. The Dialog ranking algorithm was used and Figures 1-3 were produced to show yearly productivity, journal ranking, and country ranking; the Zipf form of display (in log-log) was used to illustrate the hyperbolic distribution of journals (Figure 2) and countries (Figure 3).

### **Results**

The number of publications (Figure 1) shows a general upward trend with a peak in 2002 of 100 documents; the number (59) for 2004 is incomplete as the search was done in mid-September. Not surprisingly, the journal *Scientometrics* has the

most number (264) of papers (Figure 2); *Scientometrics* is the only journal totally devoted to publishing documents ‘concerned with the quantitative features and characteristics of science’. The journal’s subtitle is ‘an international journal for all quantitative aspects of the science of science, communication in science and science policy’. However, there are a number of LIS journals with more than ten documents, e.g. *Journal of the American Society for Information Science & Technology*, *Journal of Information Science*, *Journal of the Medical Library Association*, *Information Processing & Management*, *Journal of Documentation*, *Library & Information Science Research*, *College & Research Libraries* and *Libri*. Excluding the USA with 531 publications, Australia (37) is among the top ten productive countries; ten (27%) of the documents, with at least one author from Australia, are from the University of New South Wales.

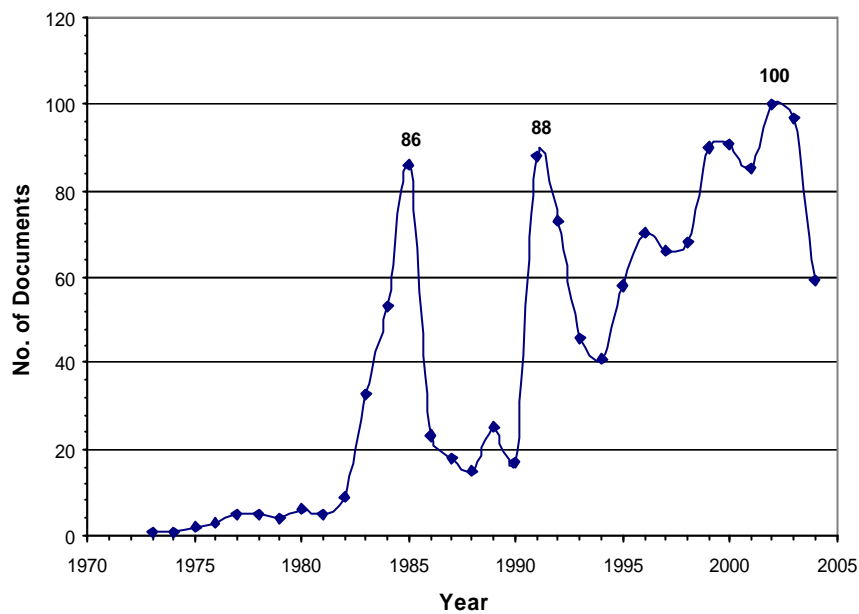


Figure 1: Yearly productivity LIS informetric publications

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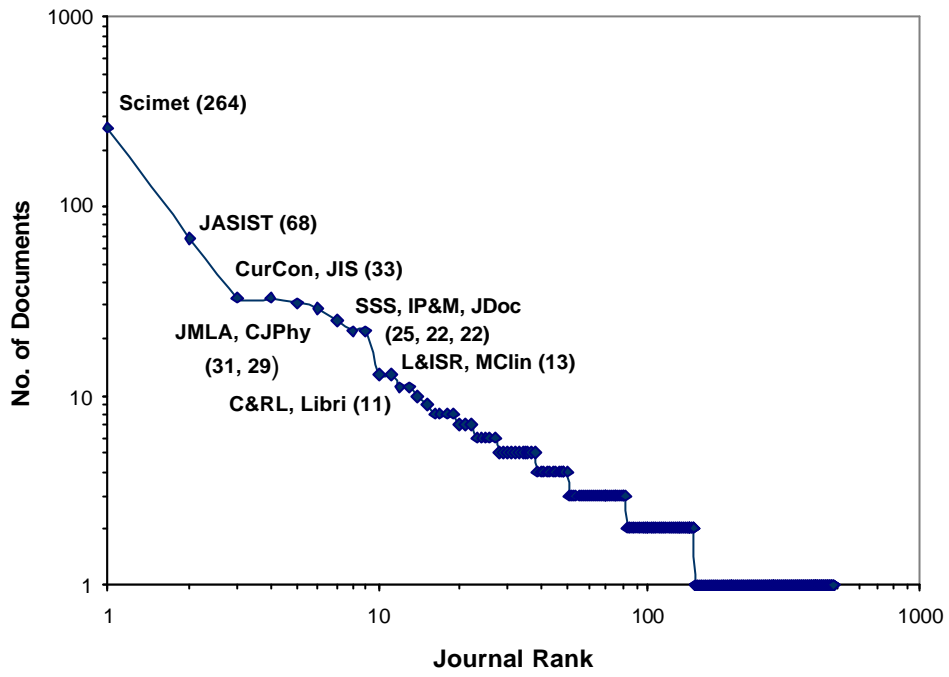


Figure 2: Journal ranking for LIS informetric publications

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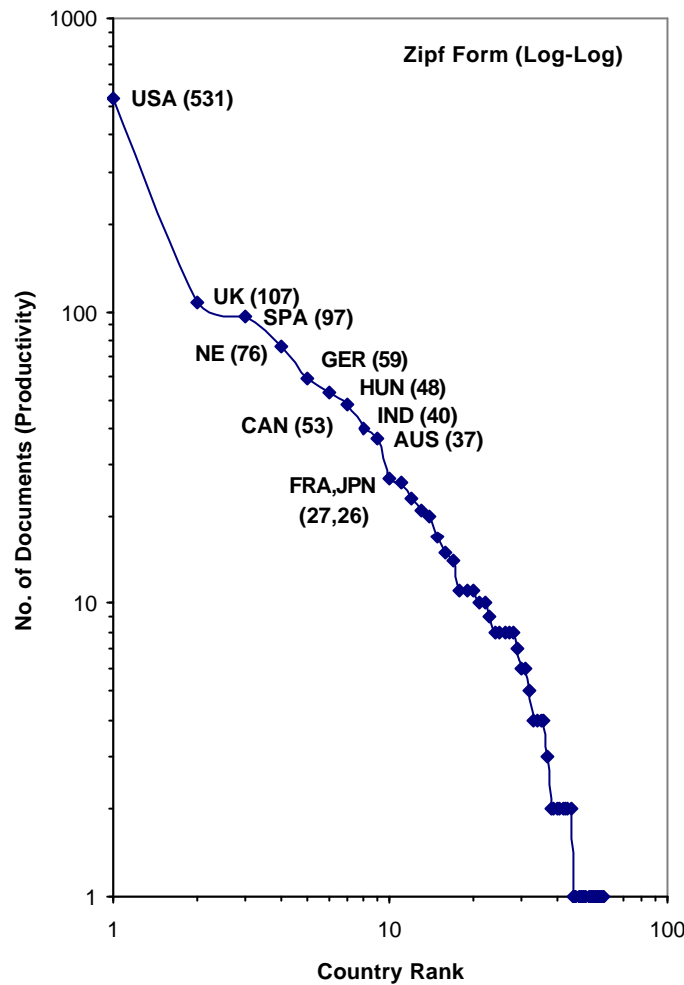


Figure 3: Country ranking for LIS informetric publications

### Informetrics at UNSW

Although there have been universities teaching librarianship in Australia since 1960, career qualifications rather than research qualifications have generally been the major focus for enrolments. Throughout Australia, enrolments in librarianship and information management programs have traditionally been fewer than in many other specialist programs and have been declining in a number of universities (Willard & Wilson, 2004; Pawley, Willard & Wilson, 2001; Willard, Wilson & Pawley, 2001). Consequently the number of academic staff available to supervise research candidates at the masters and doctoral level has also been limited. For many years, the choice of research topic at the masters level was left open to student choice with Schools attempting to supervise all comers. Often this left some students with less than optimal supervision and stretched the staff to unbearable limits. During the last decade, despite increased interest in research at the doctoral level, doctoral candidates are still the minority, with the destination

for most postgraduates being management and professional careers in libraries, academic or cultural institutions, and business corporations.

In order to build a strong research program at UNSW, we developed a research strategy and agenda based on the capacities of current staff interests and experience to supervise research students within certain frameworks and topics. To promote this plan, we established in 1998 a formal research group, Bibliometric and Informetric Research Group (BIRG), in which both staff and students could develop critical research expertise in the fields of informetrics, bibliometrics and scientometrics. This has allowed a research culture to evolve over time and to enable students to participate in regular seminars and meetings as an integral part of the group.

### ***The BIRG research program***

BIRG research strategy identifies specific thematic strands in which to concentrate its effort, and on which to plan a range of projects (see <http://birg.web.unsw.edu.au/publications.htm>). Most of the work of both academic staff and our research students has been accommodated within the major themes. BIRG's research includes investigations on the nature and characteristics of scientific research, particularly research collaboration and its effects on institutional or group performance, scholarly publication activity specifically among institutions and national groups or communities, and author characteristics and research careers of elite research groups. Other themes that are pursued relate to the use of scientific literatures and include: investigations on core and periphery literature; publishing activities in disciplines and designated research fields; journal characteristics and their impact (e.g. journal citation impact and its relation to measured and perceived journal quality); and the use of web information (e.g. its flow and influence in research fields). A thread of most research undertaken is the mapping of growth, structure and composition of large domains; and how disciplines, specialties, or fields fit or overlap with them. This theme also includes examination of the complex structures required for multidisciplinary and interdisciplinary projects. Underlying all these themes is a continued interest in the history and foundations of bibliometrics and informetrics, and the nature of informetric laws to describe and define systematic regularities.

We will now look at the ways in which the field of informetrics has already met many of the criteria and challenges for library and information science that Buckland (2003) recently identified. This paper attempts to illustrate the instances where informetric research has provided new insights into important, but inadequately understood, phenomena in the following areas relating to the provision of library services, to theoretical understandings, to elucidation of patterns and regularities in the production of literature, to design issues, particularly in the digital library area, to the development of electronic resources and indexing, as well as in the area of describing and highlighting difference among communities of users whether in specific fields or within specific institutions. What follows is an attempt to discuss the research challenges posed by Buckland (2003) and to include Australian research in these areas whenever possible.

## Research challenges in LIS: the informetric approach

### **Collection management**

Among the more difficult problems for libraries today is the need for tight fiscal management. Decisions relating to which journals to acquire and which titles to cancel, and whether to purchase print, as well as electronic access to the bundled suites of journals offered by publishers, are critical to fiscal management of collections. Informetric research has been shown to assist in decision-making relating to the selection and provision of adequate periodical services libraries. In reviewing policies on acquisitions at Monash University (Evans, 1996), a formula was applied to questions of budget allocation based on weighted factors for a range of quantitative data, e.g. student numbers weighted by level, academic staff numbers, cost of resources, and library circulation.

Journals have been rising in cost continuously for over 20 years and increasingly library budgets are under constraints in their ability to purchase new materials.<sup>iii</sup> Making informed decisions on what parts of the periodical literature to acquire (or to cancel) for selected library clientele is a matter of juggling acquisitions of resources that must be obtained to meet the needs of all clients that use the library and among competing user groups. However, if you are asked to cut dollars of any magnitude from the library budget by the end of the month or financial year, informetric research will not necessarily be of immediate help. Informetric research provides findings at a deeper level that will inform with objective and reliable data which of the Faustian choices you are considering will be the more advantageous for your user community. Citation analyses of journal literature have long been shown to provide information that is useful in assessing actual and potential journal use (Broadus, 1985; Dombrowski, 1988; McCain & Bobick, 1981) among heterogeneous clientele. Nisonger, in his monograph *Management of Serials in Libraries* (Nisonger, 1998), devotes a chapter to discussing the application of citation analysis to serials collection management.

Citation data from tools like the ISI citation indexes and Journal Citation Reports can inform collection management decisions because it demonstrates scientists' cumulative use (via citations) of specific articles. Bibliometric research is able to pinpoint lists of core journals by identifying those journals most frequently cited. Citation analyses provide objective data about which fields cite a specific journal, how frequently its articles are cited, as well as providing a list of other journal titles in which its articles are currently cited. Such citation work sheds light on usage and prestige of current journal holdings. By linking citation data on holdings to survey data on readership requirements and citing practice, studies can assist with identifying where a collection might be weeded with least detriment to users, and which new titles might augment the relevance of the journal holdings (see Hirst, 1978; Smith, 1985; Usdin, 1979). Some studies have used combinations of factors for deselection, such as ISI impact factors, ISI cited half-life, frequency of citation, linked to journal coverage in A&I services, language,

and local usage and requests (see Bourne, 1975; Broude, 1978; Deurenberg, 1993). The results of such studies are often augmented by data from surveys or discussions with users, for example with specialist communities, scientists, or faculty members.

Recent studies to identify relevant resource material in Web environments have employed a range of new metrics and modified bibliometric methods.<sup>iv</sup> Such studies seek to identify new web-based resources relevant to specific topics and to reveal 'deep' relationships among web sites that enhance relevance (see, for example, Hou & Zhang, 2003). Others are using web logs as sources of information to reveal distribution levels of articles in electronic journals and their use (see Marek & Valauskas, 2002).

### ***Understanding user communities***

Defining communities of interest for library services is an important element in effective management of library services. Informetric research methodology is a useful tool for examining current as well as past trends in usage of journals in publications via the citing patterns of specific fields or within institutions. Bibliometric data of journal usage, because it is gathered unobtrusively without recourse to the subjectivism of individual opinion statements, is deemed to be objective. Survey methods traditionally used to measure usage and needs of library users/patrons, for example readership surveys, rely on subjective personal assessments. When both methods are used together in examinations of journal usage, each method validates and strengthens the findings.

Research done by BIRG members has taken both methods separately and in combination in investigations of use of journals and other resources in the field of Australian ophthalmology (Davis & Wilson, 2003; Davis & Orsatti, 2003), clinical neurology (Yue & Wilson, 2004), and of people with chronic illness (Frances and Wilson, 2004). More recently, a survey of academic staff and student journal use and reading patterns has been undertaken with the University of New South Wales (UNSW) in association with Carol Tenopir of the University of Tennessee.<sup>v</sup> A similar survey will be undertaken at the University of Queensland in early 2005. Findings of the two studies will provide useful comparisons between the readership patterns and preferences in two Australian sites with that in the United States and other countries. BIRG members are also currently investigating the 2003 DEST C1 publications by UNSW researchers to see where UNSW researchers publish and what they cite in their publications. The results of this bibliometric study will be correlated with the qualitative results from the 'Tenopir survey'. It should provide another measure of the use of library resources (especially print and/or electronic journals) and the extent to which the library is providing adequate resources and services to its researchers as expressed by the journals that researchers published in and the sources they reference in their publications.

### ***Understanding of field and domain structures***

Library collections are not static collections but change periodically to accommodate user demand. Over time, library acquisition programs require small

and large adjustments to the mix for tailoring resources to current requirements. Such changes can be based on appropriate objective and relevant information. Up-to-date data on the changes in knowledge formation are necessary for decision-making, given the increasing interdisciplinarity of research, and the formation of large domains of knowledge where many fields, specialties and disciplines interconnect and overlap. The nature and scope of knowledge domains, and of specific fields can be identified through various informetric methods. This paper has mentioned studies that described identification of core and periphery journals pertinent for specific subject areas or topics. Such data can be used to monitor current library holdings by comparison with current listings of frequently used resources. Additionally, changes to the pool of frequently cited materials can be tracked; and changes in focus of users' requirements can be discovered through data mining of library statistics and other forms of aggregate data, such as web logs on use of electronic journals, inter-library loan requests, or use of external A&I databases.

Australian research on investigations of domains of knowledge, such as the study on the development of gerontology discipline (Howe, 1990), and the field of family therapy (Davis & Lipson, 1996), provide quantitative data on the role journals play in the evolution of disciplines, and shifts in content and focus over time. Studies on the domain of the vision sciences show Australia's role in the hierarchy of the world literature in the fields of optics and ophthalmology (see Davis, Wilson & Hood, 1999). The extent of cancer research publications in Australia (and within each state) is documented by Wilson & Pittman (2000). Work into the structure and dynamics of the field of consciousness worldwide is still ongoing (see Orsatti, Wilson & Davis, 2001). Journal citation impact in the field of clinical neurology has been the subject of a recently submitted doctoral thesis and pre-doctoral publications (see Yue & Wilson, 2004).

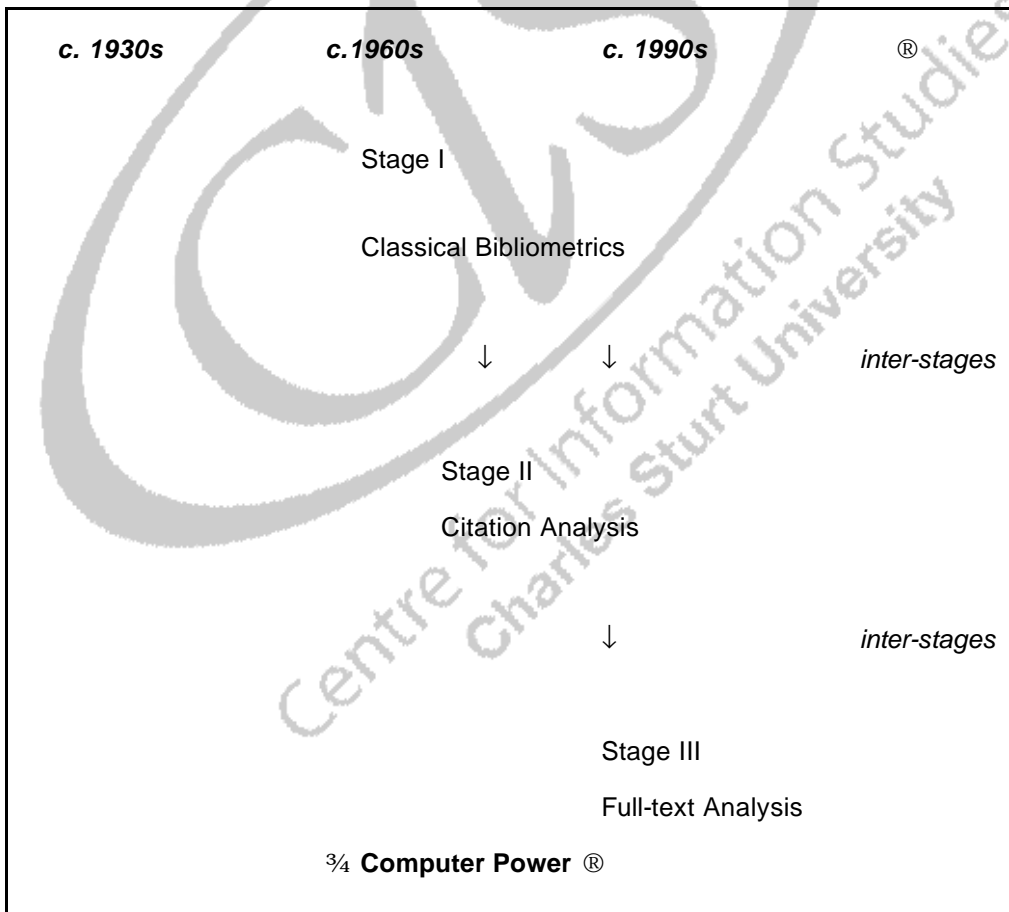
### ***Theoretical foundations of informetrics***

The foundation paper by Wilson (2003) shows three stages in the development of bibliometrics models (Figure 4). 'Classical Bibliometrics' in Stage I includes some of the BIRG contributions in the sections on *Understanding User Communities* and *Understanding of Field and Domain Structures*. Research done in Stage I looks at various bibliographic fields (e.g. author, publication year, journal name, title words, institutional addresses) to gauge, for example, collaboration between institutions, authors, output of subject domains over time, concentration of subjects in journals, etc.

Uses in LIS have already been mentioned above in for example, *Collection Management*. Stage II is 'Citation Analysis' and includes most of the remaining research undertaken by BIRG members or research-in-progress. Citation analysis uses the references from and citations to documents to measure the influence or importance of documents, authors, institutions and journals. Citation counts are used as measures of such things as obsolescence of journals, transfer of information between countries, institutions and journals. Joint citations or co-citation of documents, authors and journals help delineate the development of subject domains, provide network structures of authors, etc. Besides Yue and

Wilson’s (2004) study on citation impact, there was also an attempt by Yue, Wilson and Rousseau (2003) to understand the relationship between two ISI derived journal measures: the Immediacy Index (II) and the Impact Factor (IF). The study concluded that in almost all disciplines, the two journal measures are highly correlated and therefore the II can predict (and substitute for) the IF. The first author, Weiping Yue, has just completed her PhD dissertation on the citation impact of clinical neurology journals using structural equation modelling with partial least squares.

The work by Orsatti and Wilson (2003a) looked at citation behaviour and explores the relationship between the Gini Index of concentration and the inverted citee-citation ratio. A follow-up paper (Orsatti & Wilson, 2003b) combined sociological and informetric theories of citation to help explain variations in citation behaviour. The first author is pursuing both themes in the subject domain of consciousness for her research master’s thesis. Her work grades into Stage III of the developmental model of informetrics: that of ‘Full-text Analysis’ using a variety of software for content analysis.



**Figure 4: Summary of developmental model of bibliometrics**

BIRG members are currently engaged in co-citation analysis of journals in information systems; co-citation analysis of authors in Australian ophthalmology and co-citation analysis of documents in the global subject area of ophthalmology.

Another stream of research being undertaken in SISTM uses content analysis for handbook descriptions and newspaper ads in the study of the 'rise and fall' of LIS education in Australia.

Stage III informetrics:

will increasingly interact with additional fields from other lineages which have their own special tasks in the study of 'full text'. Those most like Informetrics in performing quantitative analyses of specifically-interpreted classes of symbol strings include: Content and Coverage Analysis (with a Communication and Media Studies lineage), Statistical/Quantitative Linguistics (with a Linguistics lineage), and Stylometrics (with a Literary Analysis lineage). But there are many more: Syntactics, Discourse Analysis, Computational Lexicography, Knowledge Management, Software Metrics, Rhetoric, and so on, and so on. And the notion of text can also be broadened. It's hard to avoid wondering how Informetrics, and more generally Information Science, will adjust to the new neighbours. Will we see the gradual development of some integrated science of text, and more particularly, of a science of public knowledge? (Wilson, 2003).

## Conclusion

Informetric research applied to problems in the field of library and information services is increasing worldwide, particularly to the evaluation of journals and for journal collection planning and management. New areas of informetric research applied to problems of creation and management of digital library services and for identification of resources in the Internet are emerging. The graphs showing the increasing use of quantitative informetric methodology are based on data from ISI-selected journals.

However, if it were possible to collate all LIS and other journals that publish informetric research relevant to library applications, planning or management, the evidence would be far stronger. Although many of the studies are not conducted with a library or management perspective, the informetric research we have identified has applicability and relevance to LIS problems, particularly at specific field or discipline levels. Indeed, researchers from diverse backgrounds have come to use informetric methods as a way of elucidating the structure of fields and of identifying where the literature of their field is to be found. Such studies show that fields are becoming interdisciplinary in scope and that the literature pertaining to their field is spread across a wide range of journals.

Australia's contribution to the informetric (including bibliometric and scientometric) literature is also showing strong growth. Contributions come from the related fields of information management, information systems and computer science, but also from other disciplines, such as education, policy studies, and medical and allied health fields. To get full benefit from informetric research for LIS applications, the methodology needs to be taught in research course

components to students taking information-related degree programs. Also we suggest that library managers look beyond the library-related literature to locate work undertaken from the viewpoint of the disciplines themselves. Those research findings could well provide a relevant but different input to solutions or problems in library management and collection development.

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## **Select list of informetric research in library service and management**

### **Library Management**

- Selection and deselection of periodical literature for specific fields (Deurenberg, 1993).
- Determining areas of focus of library use (Buckland, 2003; Nicholson, 2003a).
- Service optimisation through identifying useful digital and internet sources for patrons (Hood & Wilson, 2003; Hou & Zhang, 2003; Zucca, 2003).
- Core journal identification and journal ranking studies (Black, 1983; Hirst, 1978; Nisonger, 1998; Summers, 1984).

### **Understanding User Communities**

- Comparative analysis of user communities (Buckland, 2003).
- Discovering patterns of use through data mining of library data (Papatheodorou, 2003).
- Defining the boundaries of library and related materials use in specific communities (Buckland, 2003; Wormell, 2003).
- Personalisation of service through discovery of communities of users with expressed needs (Wormell, 2003).

### **Understanding of Field and Domain Structures**

- Identifying internal and external data sources (Wormell, 2003; Nicholson, 2003b).
- Retrieval improvements through matching users with specialised indexes (Buckland, 2003).
- Identifying 'top' journals used by specific communities (Wormell, 2003).

### **Theoretical Foundations of Informetrics**

- Clarifying basic structural patterns of literature use, obsolescence, and scatterings, through examination of the mathematical formulations of laws, such as Lotka's or Bradford's law (Yue, Wilson & Rousseau, 2004).
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## Endnotes

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- i Dialog, a part of the Thomson business, is the 'world's first online information retrieval system to be used globally with materially significant databases' (<http://www.dialog.com/about/>).
- ii The Dialog search protocol uses '?' as the truncation symbol; 'n' as a proximity operator to indicate that words on either side of the 'n' operator can appear in either order; '(3n)' specified up to three words intervening; and finally, 'or' is the logical operator used to search near synonymous words. For a more detailed explanation of Dialog's search protocol, see the various search aids (<http://support.dialog.com/searchaids/>) and user guides (<http://support.dialog.com/guides/>) provided by Dialog.
- iii The University of Queensland Cybrary Price Shock (<http://www.library.uq.edu.au/priceshock/>) web pages present a graphic depiction of the 'rising costs of library journals'. There are also numerous journal articles presenting similar views on the issue: e.g., *Serials Librarian*, *Journal of Academic Librarianship*, as well as e-journals such as *Canadian Content* ([http://www.canadiancontent.net/dir/Top/Society/Issues/Intellectual\\_Property/Free\\_Access\\_Theory/Journal\\_Cost\\_Issues/](http://www.canadiancontent.net/dir/Top/Society/Issues/Intellectual_Property/Free_Access_Theory/Journal_Cost_Issues/)).

- iv Webometrics or Cybermetrics is a new sub-field that has emerged to study the quantitative analysis of scholarly and scientific communications in the Internet. See for example: <http://www.cindoc.csic.es/cybermetrics/cybermetrics.html>
- v For a copy of the survey, visit the UNSW Library web page at: <http://info.library.unsw.edu.au/psl/about/patterns.html>



## DISCUSSION

[M Davis] Informetrics is quantitative, qualitative, positivistic, and concerned with business production and with teams of people who work together. Research is contemplative, long term, deep in approach. It cannot quickly inform management decisions – look to informetrics for objective knowledge about issues.

[M Davis] with respect to journals producing research for LIS professionals to read that are listed by ISI, it is important to regard USA as an outlier influence because the production is so much greater. It is important to consider Australia in terms of other countries of similar population.

[M Davis] University of New South Wales set up the research program strategically, based on the interests of staff members. Masters students are channelled into various themes of research so as to produce a critical mass – to build on critical expertise. There are regular seminars, mentoring. There is liaison with library, the geographic information systems area, and health informatics. Monthly seminars attract approximately 30 attendees; weekly meetings – 15-20. They invite local researchers, e.g. University of Technology, Sydney, and try to draw across disciplines and institutions. One of the strong points of UNSW research is webometric data.

[M Davis] There is a need to bring in collaborators, consider different ways of going about research work, and become cross-disciplinary for particular research grants. UNSW is in dialogue with the ASIST (American Society for Information Science & Technology) and ISSI (International Society of Scientometrics and Informetrics) to set up collaborative enterprises – create web visibility, go to cross-disciplinary conferences.

Anne Horn, as respondent to this paper, illustrated her comments with a presentation. The following comments are extracted from that presentation and questions and discussion surrounding it.

[A Horn] Library practitioners are certainly interested in all aspects of informetrics as defined by Mari. It does not surprise me to learn that there has been a steady increase in the number of papers being published in informetrics, including library-related applied research.

The rapid changes in publication, including the continually changing e-environment; the different patterns of use, both in the way students learn and how researchers are informed and kept up-to-date; and the increasing interdisciplinarity of research and the scholarly networks consequently formed are all trends that need to be constantly monitored by libraries.

Libraries certainly draw upon log analysis of the use of their different web-based services, and products such as *Web of Knowledge* and JCR (*Journal Citation*

*Reports*) to assist in making informed decisions about core journals to acquire, and, for that matter, quarantine from cancellation. New purchase decisions are also informed by document delivery or interlibrary loan data.

In practical terms, I recall a cancellation exercise back in 1999 at the University of Queensland where we took great care to annotate lists sent to Schools/Departments highlighting journals which according to ISI data were considered to be top ranking titles in the field. Further indicating we would be reluctant to cancel these. We discovered that the academic staff often did *not* consider the core titles to be essential to their research and were keen to preserve other subscriptions than those ranked highly by ISI. Indeed, the Philosophy Department entered into a lengthy debate (you guessed it) on the ‘philosophy of journal rankings’.

Print and ‘e’ collections through selection and deselection must provide effective support of research priorities, meeting the needs of cross-discipline and multi campus research.

Libraries are good at log analysis of web resources, citation analysis and impact factors to inform selection/deselection decisions. University of Queensland makes use of such analysis. Other analysis might involve readership surveys; working with communities of users such as researchers to identify core journals; and use of focus group studies (as exemplified by the Australian Library Collections Taskforce).

Carol Tenopir is extending her Australian survey on journal use and reading patterns to include University of Queensland (access to instruments used is available via <http://web.utk.edu/~tenopir/research/index.html>). It uses Critical Incident Technique to look at ‘last journal experience’. It is important to consider usage data as well as the purpose of use.

[*M Davis*] (in response to a question on bringing sociologists and bibliometricians closer together) Most people concentrate on their own area. Scientometrics is close to information science people; sociological citations don’t cluster well with these – so there is demarcation.

[*A Horn*] Citation counting in the social sciences in Australia is quite worrying – citation indexes don’t cover journals in which Australian researchers should publish to target audiences; it is, therefore, likely they publish in overseas journals. There is a disincentive to publish in our own (Australian/New Zealand) journals. At University of Queensland, the social sciences area is looking at known researchers in the field, editorial boards and web usage (not impact factors). The issue of Australian journal publishing is not well-covered. Use of ‘e’ repositories is increasing research exposure. For the purpose of measuring maybe it should be compulsory to lodge in a repository

[*M Davis*] Citation analysis and citation impact are two different things. We shouldn’t feel tied to the impact factor as one or two really big papers can change

the face of impact factors. With respect to Australian journals, the emphasis by the Australian government on peer review has influenced publishing – and impact factor is of diminishing importance.

