

The Relationship between Primary and Secondary Literature *

학술정보에 있어서 1차 자료와 2차 자료의 관계에 대한 연구

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ABSTRACT

The literature may be divided into two broad categories: primary and secondary literature. Primary literature comprises documents which contain the full text of the author's work. On the other hand, secondary literature, such as indexes, abstracts, bibliographies, reviews and surveys, provides signposts to the primary literature. This paper intended to examine and analyze the relationship between primary and secondary literature through the previous research and the theory, and the actual study which compared it with the lists of journals in three secondary literatures: Library and Information Science Abstracts(LISA), 1998; Library Literature (LL), 1998; Information Science Abstracts (ISA), 1998. Some of the problem involved in the study of journal overlap and coverage patterns of secondary services are discussed. Conclusions are drawn about the impact on library and information science selection policies and organization of library collections.

초 록

학술정보는 1차자료와 2차자료의 2가지로 구분할 수 있다. 1차자료는 학술정보 그 자체이고, 2차자료는 색인, 초록, 서지 등과 같은 1차자료를 찾아볼 수 있는 길잡이이다. 2차자료에 수록된 정기간행물의 중복된 점과 범위를 이전에 연구한 자료와 금번 조사한 자료를 비교 검토하였으며 문헌정보학분야 2차자료 Library and Information Science Abstract (LISA): Library Literature (LL): Information Science Abstract (ISA) 등 3가지의 주요 2차자료를 비교 분석한 결과 문헌정보학 관계 자료선정 및 장서개발 정책에 영향을 미칠 수 있음을 제시 하고있다.

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1. Introduction

The literature may be divided into two categories : primary and secondary literature. Primary literature comprises documents which contain the full text of the author's work. A primary document is normally complete in itself within its intended limits: textbooks, articles in journals, reports, patent literature, theses and trade literature. On the other hand, secondary literature, such as abstracts, indexes, bibliographies, reviews and surveys, provides signposts to the primary literature. It indicates in a given field what primary literature exists or what has been published. It helps in the process of research to obtain further information as to identify particular items which may be interesting.

The primary journal literature of some subjects is covered extremely well, including more than one secondary service, whereas the primary literature of others receive poor coverage. New subjects and interdisciplinary fields have commonly been well served. Secondary services have commonly been oriented toward the major subjects and disciplines rather than to user groups, although in the past decade many oriented services have appeared. The result is that the provision of secondary services is uneven, their value to different user group is relatively unknown, and there is a good deal of

duplication. As for the chasing primary literature, however, the secondary literature is an important guide. It enables a quick preliminary survey to be made of a large number of primary tests through lists and abstracts. Whereas without it much of the primary literature can not easily be found or evaluated. Secondary literature is not only a signpost to the primary literature pertaining to the information wanted. On occasion it can in itself be a source of direct useful information. Like so many things, a single primary literature was not enough, and in time, other secondary literatures were created to fill needs of other areas.

There are two kinds of important characteristics in secondary literature. First, the extent to which a secondary literature covers the primary literature, and second, the extent to which a service overlaps with other services in terms of coverage of the primary literature. The way in which data on coverage and overlap can be applied to the planning and rationalization of secondary services is discussed. It is clear that the present study aiming solely at identifying overlap patterns must concentrate upon article coverage, and not journal title coverage, by secondary services. However, the objective of the present study is to identify clusters of journals according to citation data, and then to see how far the clusters match the patterns of coverage of journals. Therefore, it is essential to have data about

journal rather than article coverage.

2. Previous Research and Results

The first modern attempt to develop an overlap theory and the analysis of journal coverage overlap theory was done by Martin in the mid-1960s (Martyn, 1964, 1967). Other studies such as Bradford, 1937; Glass, 1955; Himwich, Field, Garfield, Whittock, and Larkey, 1954; Orr and Crouse, 1962; Sewell and McCann, 1956; UNSCO preceded in 1962 that of Martyn but none covered as many subject areas nor presented theoretical framework. Martyn outlined a naive theory of journal coverage overlap and presented several case studies of secondary sources. His data collection methodology employed the selection of recent bibliographies on specific subjects and compared them to the author entries in abstract journals. He concluded that only 70 % of the relevant materials in the abstract journals had been reviewed, and half or more of the literature was covered by more than one secondary source.

Bost has pointed out that bibliographies were frequently constructed using the secondary literature so Martyn's use of the secondary literature as a data source invalidates many of his conclusions (Bost, 1969). Also, Martyn made

no attempt to present confidence intervals or ranges of dispersion for the data analyzed. He did, however, find that perhaps 20% of the citation matches might be neglected even by experienced searchers when searching the secondary sources. His study presented no discussion of relative costs of secondary sources and gave no suggestion for secondary source selection. That is, he described no application for his quantitative results.

Following Martyn's work there were several attempts to analyze coverage overlap in narrower subject areas. There has been a major study of journal article overlap in 14 indexing and abstracting services, undertaken by the National Federation of Abstracting and Indexing Services (NFAIS) and reported by Bearman and Kunberger. This study viewed previous studies critically since they focussed journal overlap only. And indeed, since the NFAIS study, there appears to be general agreement that journal overlap studies themselves are of relatively little use compared to journal articles overlap studies. However, this is not necessarily the case. While it can be agreed that journal overlap does not necessarily indicate journal article overlap, there may be many cases in which it does, especially where two or three abstracting services cover the same field. Article overlap is likely to be low when two

services cover a very wide range of materials in fields peripheral to the major subject of the service. For example, an abstracting service psychology may cover a number of journals in physiology, biochemistry and other fields peripheral to psychology, but would not provide the same degree of article coverage for journals in peripheral fields as for mainstream psychology journals.

As a general rule journal coverage and journal article coverage may be high in case where two or more services operate in one particular field and where mainstream journals are concerned. But coverage and overlap between services in different fields may show appreciable differences between journal and journal article overlap.

Several researchers have applied one major simplification in analyzing one major simplification in analyzing overlap. They have used the primary journal title overlap and ignored analyzing the overlap of the actual articles abstracted (Dolcourt & Braude, 1976; Hanagan, 1973; Orr, 1977). Since most services index and abstract selectively from the journal they scan, these studies generated upper bounds for the degree of traditional coverage overlap among secondary sources. However, this upper bound is only a very rough indicator of the overlap since an article in journal scanned by several secondary sources may not be

abstracted by any one of them (Bearman & Kunberger, 1971; Wood, Flanagan, & Kennedy, 1973).

The next major analysis of secondary source overlap was done by a tripartite group from Biological Abstracts, Chemical Abstracts, and Engineering Index. Begun in April, 1970 (Flanagan, 1973; Larson, Bernard, & Padin, 1976; Wood, Flanagan, & Kennedy, 1972a, 1972b, 1973), this study has been documented in three phases. Wood stated that of the total of 14,592 journal monitored by the three services only 1% was monitored by all three, 27% by two out of the three, and 72% were monitored by only one of the services. Phase 1 only analyzed titles but the subsequent phases covered both titles and article overlap. Phase two results (Wood, et al., 1973) concluded that only the Chemical Abstracts and Biological Abstracts overlap and the Chemical Abstracts and Engineering Index overlap justified further study. The data and results presented were statistically justified since they did present reasonable sampling techniques and confidence intervals. Third phase report (Larson, et al., 1976) simply concluded that the three services print formats could not be made uniform since the current database file structures differed so greatly. All future studies should at least obtain an indication of article overlap. In cases where it is fairly high, a study of journal overlap may be

useful and certainly less time consuming than a study of article coverage and overlap.

Bearman (1977) was the first to apply the statistical techniques of both factor analysis and multidimensional scaling (MDS) to the analysis overlap data. These techniques were used to identify natural groupings of secondary sources. MDS is an analytical tool for using just "distances" between objects to construct their multidimensional spatial relationships (Kruskal & Wish, 1978; Schiffman, Reynolds, & Young, 1981; Young & Hamer, 1987; Young & Lewyckyi, 1980; Young & Householder, 1938). Berman identified several natural groupings such as physics, earth sciences, and life sciences within the collection of sources not surprising considering the content of the secondary tools investigated. However, she justified these groupings quantitatively and no longer based the groupings on intuitive hunches.

Both sampling techniques that use alphabetical lists and sampling from external lists were criticized because of variation in cataloging rules and no truly comprehensive lists exist. This information is available in many basic statistic books but the examples covering overlap problems are very illuminating. Of special interest was the incomplete discussion concerning the overlap of institutional cumulations of monograph collections.

Since the Bearman report many studies have

taken a narrow subject area and analyzed the coverage overlap among secondary sources either in their manual or online format (Konings, 1985; LaBorie & halperin, 1985; Meyer, Mehlman, Reeves, Origoni, Evans, & Sellers, 1983; Poyer, 1984, Smalley, 1980; Thorpe, 1982). Most of these have included multiple overlap data and analysis. However, few have applied the rudimentary statistical safeguards listed in Buckland et al. (1975). These studies often used random samples assuming implicitly but with no justification that the underlying distribution was uniform. They rarely presented confidence levels for their conclusions and several were studies of just journal titles. Some of the papers since Bearman and Kunberger (1977) and Buckland et al. (1975) have eliminated many of the statistical analysis and data collection sampling problems by being exhaustive. They used all articles in all sources user study and stated the actual traditional overlap values (Hasso, 1984; Poyer, 1984, etc.).

Few studies interpret the coverage overlap values computed or give recommendations for the use of the overlap values. And those that do, unfortunately, present no consensus. Rarely have any studies provided criteria for selection of secondary sources. Four notable exceptions are Longo and Machado (1981), Konings (1985), Luthra (1971), and Orr (1977):

these do provide descriptive selection guidelines. However, the Longo and Machado study analyzed journal titles, while the Konings study states that for a reliable literature search all sources must be considered.

Within the collection of journal overlap studies there are contradictory arguments indicating that low overlap is no worse than high overlap. These contradictions would indicate that traditional overlap values by themselves are insufficient guides for material selection. Reading the journal overlap literature indicates that none of the early and only one recent study has provided any longitudinal analysis of journal coverage overlap. The notable exception is LaBorie (1981), which updates Goldstein (1973) and includes multidimensional scaling analysis. It is possible that such studies will not provide useful information: however, if such studies were done their usefulness or lack of it would no longer be in question. The only conclusion that can currently be made is that there is a given level of traditional coverage overlap among a set of secondary sources in a limited subject area over a limited time period.

3. Theoretical and Observed Patterns of Overlap

The literature of information science has

contained investigations of journal coverage overlap or secondary source overlap for more than 50 years (Bradford, 1937); however, the significant work has been done during the past few decades. This literature refers to a secondary source as the product of an abstracting or indexing service. These products may be journals themselves or online databases. The traditional definition of journal coverage overlap applied to distinct secondary sources ignores the relative sizes of the sources. Journal coverage overlap has traditionally been defined as the ratio of the number of journal titles or articles in the intersection of two secondary sources to the number in their union. This definition for journal coverage will be referred to in this article as traditional overlap. This definition of journal coverage and its associated theory have varied only slightly during this 50 years of research. The two major thrusts of this research have been the measurement of the amount of overlap and the comparative analysis of indexing and abstracting records. A chronological assessment of this research indicates that several shifts have occurred in the major methods employed in data collection, statistical analysis, and in the media of the data during the past few decades.

The potential number of overlap patterns is very large, indeed almost limitless, but the main types of pattern can be illustrated by a

relatively small number of cases. The simple case of overlap is shown in the following figure 1: service S1 and S2 overlaps by Sx with the subject field in question defined as E1.

There are E1 can be any size, and it might overlap with other discipline E2 and E3, whose boundaries could be drawn to overlap with S1 and S2.

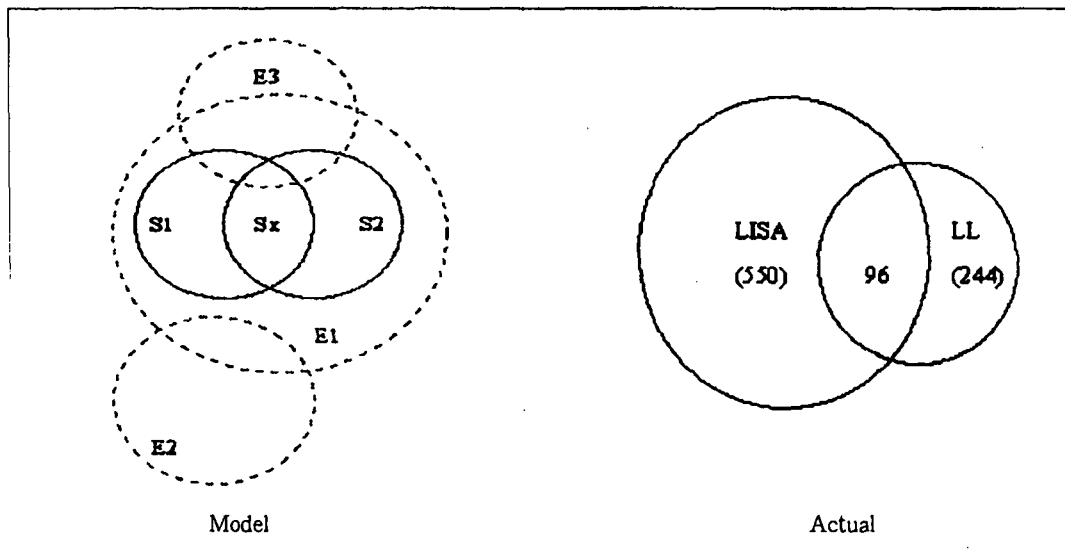


Figure 1: The simple case of overlap

In the following figure 2 there is a definite triple overlap between S1, S2 And S3 in Sx.

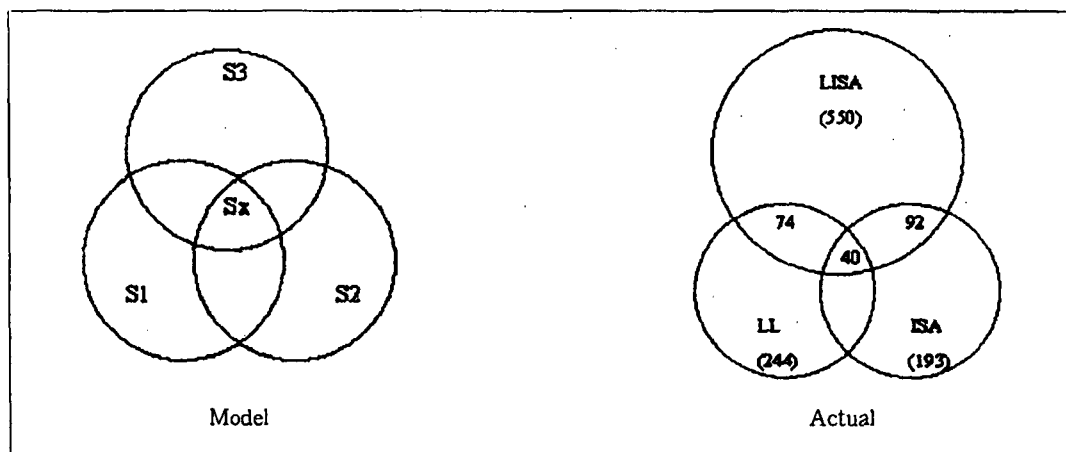


Figure 2: The triple overlap between three services.

In complex cases the potential amount and type of overlap increases as the number of literatures has increased. If the number of services has increased and there is no group of primary journal common to all services, it may mean that the maximum, number of services relevant to the subject has been exceeded. As complex overlap is described, it is possible to deduce characteristics about the literature of the subject in question. For example, if a number of services have a part of the primary literature in common it suggests that this part is regarded as particularly important, perhaps as the core area of the subject. There are cases where the latter is not necessarily true, as shown by Wood,

In Flanagan, and Kennedy geology journals were shared by ENGINEERING INDEX, CHEMICAL ABSTRACTS, and BIOLOGICAL ABSTRACTS, and regarded peripheral engineering, chemistry, and biology. Nonetheless, geology is relevant to areas in all three subjects (engineering, chemistry, and biology) and ENGINEERING INDEX, CHEMICAL ABSTRACTS, and BIOLOGICAL ABSTRACTS are services with an exceptional scale of journal coverage. In general, if there is a tendency for one or more services to remain in isolation, this suggests sub-areas within a discipline.

Two assumptions are made in considering model or actual overlap patterns: the first assumption is that relevant secondary

services can be identified. The net was cast widely so as to identify meaningful subgroup of services. The second assumption is that it is possible to identify fairly clearly, in terms of primary journal, the boundary of the discipline which raises serious problems. It is important to know something about the extent of the potential universe before rationalization can be considered. In certain cases redefinition of boundaries could create an effective rationalization as well as adjustments to coverage and overlap of individual services. In some cases the boundary could be conterminous with one service or with a group of services.

4. Coverage Patterns

It is always possible to identify the number of journals that are covered by a secondary service but much more difficult to decide upon the journal that should be covered. If a secondary service is produced for a given discipline, it is reasonable to expect the majority of primary journals in that discipline to be covered. But even for established disciplines such as philosophy, astronomy, chemistry, economics, etc., it may be difficult to decide on the extent of the primary literature and how much should be covered. There are always some peripheral

journals, new journals that are not immediately associated with an established discipline, and areas outside the main body of subject material that may be relevant. If it is suspected that a secondary service should cover more or less the primary literature it must be shown that there is literature to cover. Data from user studies may also be required in order to demonstrate a demand for an extension of coverage.

Empirical methods which could be used to establish the subject boundaries of the literature for comparison with secondary service coverage and overlap include (1) classification schemes, (2) consensus data from users, subject experts, use/demand for primary literature, and citation frequencies and groupings, and (3) existing secondary services. The primary literature coverage patterns may or may not correspond with the patterns derived from a classification scheme, and there may be large differences between the patterns that are derived from citation data, used data, and user judgments. The patterns of coverage and overlap of secondary services may themselves provide some guide to the range and structure of the primary literature. If there is general agreement about the secondary services which are relevant to a particular discipline, it could be argued that over a relatively long period of time these secondary services, taken together, have

adequately covered the primary literature. Such assumptions are perhaps more valid for fairly stable and established subjects. In these cases rationalization would be concerned with the extent to which the services should cover material from related fields, the extent to which they should overlap, and the extent to which new services may be required for sub-areas.

It is interesting to know the number of journals that must be covered in order to give a certain coverage of the field of interest and also how far back the search must go. In general the scattering of references tends to follow a pattern of which the great majority of references at any discipline are found in a comparatively small number of journals. In some established areas in science good coverage can be obtained by searching relatively few journals. In some fields, a multi-discipline coverage and the lack of few core journals lead to a high degree of scatter.

Descriptive accounts of coverage do not in themselves provide sufficient justification for changing the existing network of services or initiating new ones. The descriptive studies of coverage do not give an indication of either the extent to which existing coverage may be redundant for reasons other than overlap, or of gaps in coverage for reasons that may be perfectly valid. The problem involved in getting coverage is to get agreement as to what should be covered: this cannot be

obtained solely from a quantitative descriptive account of secondary services. Data about needs, preferences, and users must also be assessed.

5. Overlap in journal coverage between secondary literature in library and information science

In his recent review of the bibliographic control of library and information science literature, Marco (1983) commented: "Unfortunately there is much overlapping and duplication of effort among the international abstracts services and indexes. It is interesting to examine the overlap of journal title coverage among library and information science abstracting and indexing services.

Colbans (1972) provides a good summary of the major research conducted from 1963 to 1971 on library and information science secondary services. He noted two studies as significant in their analysis of journal coverage. Gilchrist (1965) examined the coverage of four abstracting and two indexing services by searching them for articles from a bibliography on the evaluation of information systems. He provided the percent of coverage by each service and found that 87% of the articles were covered by at least one of the six services. Gilchrist and Presanis (1971)

examined the overlap of journal coverage among three abstracting services showing the overlap between pairs of services and list 51 titles common to all three services.

There are several factors affecting indexing overlap that this study does not measure. Each service lists the journals that it indexes but not all indicate whether those journals are indexed selectively or completely. Further, each service has its own focus and two services indexing the same journal may not necessarily index the same articles from that journal. This study looks only at journal coverage and does not consider indexing proceedings, technical reports, monographs or any other type of publication.

With the exception of ABJ (Abstracted Journal), I evaluated the same secondary services LaBorie(1985). The three services evaluated are as follows.

Information Science Abstracts (ISA) is sponsored by several professional organizations including the American Society for Information Science, the Special Libraries Association, and the Division of Chemical Information of the American Society. It is published monthly and a subject index is published in each issue of ISA, covering the publications indexed in that issue. A cumulated subject index is published in the final issue of the volume.

Library and Information Science Abstracts (LISA) is published monthly by the Library

Association, London. The subject fields covered include library science, information science, records management and subject disciplines which are likely to be of interest to librarians and information workers. LISA also does selective indexing of some of the journals in its source list.

Library Literature (LL) is published six times a year, February, April, June, August, October, December with a bound annual cumulation each year by the H.W. Wilson Company, a major producer of indexing services in the U.S. No abstracts are published in LL but the indexing includes news items and reviews that are not covered by the abstracting services. LL occasionally includes also includes relevant articles from journals covered by other Wilson indexes.

Comparison of findings, 1981/1998

Following the pattern set in LaBorie, I compiled a list of all journals indexed in any of the three services. From this list I am able to derive the same type of information as LaBorie obtain.

Number of Titles Indexed

As Table 1 shows, LISA, which indexes the most titles, has increased its coverage. However, ISA has significantly decreased more than two thirds its coverage.

TABLE 1 Number of Titles Covered by Services

	LISA	LL	ISA	Total Titles
LaBorie	451	211	655	1317
Oh	550	244	195	987

Number and Percentage of Unique Titles in each Services

Some journals are indexed by only one service, which call these the unique titles. Table 11 shows the number and percent of unique titles in each service and compares my findings with LaBorie's.

In general, it appears that the number of unique titles of LISA have been increased, on the other hand, that of LL and ISA have been decreased.

The LISA list contained 324 entries for journals that were not mentioned by either LL or ISA. The LL list contained 62 entries covered solely by LL, and the ISA list provided 93 entries for journals that neither LISA nor LL covered.

TABLE 11 Number and Percentage of Unique Titles in each service

	LISA	LL	ISA
LaBorie	250	69	508
	55.4%	32.7%	77.5%
Oh	324	62	93
	59%	25%	48%

Title Overlap

By "overlap", one means the indexing of a

TABLE 111A Title overlap 1981

	LISA	LL	ISA
LISA	--	138	94
LL	138	--	45
ISA	94	45	--

TABLE 111B Title overlap 1998

	LISA	LL	ISA
LISA	--	174	92
LL	174	--	48
ISA	92	48	--

title by more than one service. Table 111A and 111B show the amount of overlap between pairs of services and Tables 1V A and 1VB show the percentage of overlap.

As a matter of practical interest, the "best combination" of services for giving maximum coverage of the 1317 titles in Table 1 is LISA and LL. LISA covers also the greatest number of unique titles. In checking the journals indexed in LISA, LL and ISA 1998, it is interesting that only 40 journals titles were found to be abstracted by all three services. The actual model in Figure 2 suggests that the 40 titles give a good guide to what the core journals of library and information science are, and these are listed alphabetically in Table 1V.

TABLE 1V 40 core journals abstracted by all three services 1998

Aslib Proceeding
Behavioral & Social Sciences Librarian
Bulletin of the American Society for Information Science-
Canadian Journal of Information and Library Science
Cataloguing & Classification Quarterly
Christian Librarian
Collection Building
Collection Management
Database
Education for Information.
EMedia Professional
Government Information Quarterly
Information Development
Information Processing and Management
Journal of Business and Finance Librarianship
Journal of Documentation
Journal of Government Information
Journal of Information Ethics
Journal of Information Science
Journal of Interlibrary Loan, Document Delivery and Information Supply
Journal of Librarianship and Information Science
Journal of Religious & Theological Information
Journal of the American Society for Information Science
Libraries & Culture
Library and Information Science Research
Library Management
Library Resources & Technical Services
Library Review
Library Trend
Libri
Medical Reference Services Quarterly
Mousaion
Multimedia Information & Technology
Music Reference Service Quarterly
Online and CD-ROM Review
Popular Culture in Libraries
Resource Sharing & Information Networks
Science & Technology Libraries
Searcher
Serials Librarian

6. Conclusions

This paper updated the early research by examining the overlap of journal title coverage among today's library and information science abstracting and indexing services. The present study provided a description of the relationship between primary and secondary literature through the actual study, which compared it with the lists of journals in three secondary literatures: LISA, LL and ISA.

It is found that LISA has increased its coverage; on the other hand, ISA has decreased its down to one third its coverage. These changes may reflect the profusion of new journal titles and the inability of the Abstract and Indexing Services to keep up with

the indexing of all of these journals. As a result, the indexing services are becoming more specialized. And 40 journal titles were abstracted by all the three services. It is suggested that they give a good guide to what the core journals of library and information science are.

In this paper, two important characteristics of a secondary service are considered. First, the extent to which a secondary service covers the primary literature, and second, the extent to which a service overlap with other services in terms of coverage of the primary literature

Indirectly the results of this study indicate the impact of library and information science selection policies, the organization of library collections and the choice of the tools.

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