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THE EVOLUTION OF LIBRARY AND INFORMATION SCIENCE 1965-1985: A CONTENT ANALYSIS OF JOURNAL ARTICLES

KALERVO JÄRVELIN and PERTTI VAKKARI
Dept. of Information Studies, University of Tampere,
P.O. Box 607, SF-33101 Tampere, Finland

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Abstract—A content analysis of the research of library and information science (LIS) from 1965 to 1985 is reported. The aim is to find out how international research in LIS is distributed over topics, and what approaches and methods have been used to investigate these topics. The study samples consist of 142, 359, and 449 full-length research articles published in 1965, 1975, and 1985, respectively, in core LIS journals. The proportion of library and information service activities, and information storage and retrieval among the topics of the research articles was each 25% to 30% through the years. There was very little research on methodology (1%-8%), information seeking (6%-8%), and scientific communication (5%-7%). The proportion of empirical research strategies was high (49%-56%) with survey method (20%-23%) as the single most important method. A conceptual research strategy (mainly verbal argumentation) was employed in 23%-29% of the articles and system analysis, description and design in 10%-15%. The most remarkable changes from 1965 to 1985 are the loss of interest in methodology and in the analysis of LIS and the change of interest in information storage and retrieval from classification and indexing (from 22% to 6%) to retrieval (from 4% to 13%). Cross-tabulations of article topics with research strategies and approaches are presented.

1. INTRODUCTION

This article analyzes research publications in library and information science (LIS), in particular (a) how the research publications are distributed over topics, and (b) what approaches, research strategies, and methods have been applied from 1965 to 1985. Such an analysis reveals the foci of LIS research, their coherence, changes, and neglected areas. It supports the development of an understanding of what LIS is and how it may evolve.

LIS literature provides many statistical analyses of LIS research publications, including Atkins (1988), Feehan, Gragg, Havener, & Kester (1987), Hauser (1988), Nour (1985), and Peritz (1981). However, no earlier study covers the whole scope of LIS, is longitudinal, and provides systematic classifications of LIS topics and research methods (Järvelin & Vakkari, 1990). In this article, we aim at overcoming these limitations. We use a systematic hierarchical classification of LIS topics which differentiates major fields of LIS research and their subfields. Moreover, we distinguish research strategies, methods of data collection, and methods of analysis among the methodological aspect of the studies. We also analyze and classify the viewpoint on information dissemination (e.g., the intermediary's or end-user's viewpoint) and the social level (e.g., individual, organizational) of the object of study among the approaches in the research.

Through the application of these classifications we can provide novel results on the distributions and relationships of topics, approaches and methods in LIS research and their evolution. Due to the differences with respect to earlier studies, it is difficult to compare the distributions of topics between the present and the earlier studies. However, we apply the same classification systematically on all three yearly samples of source data.

As in most earlier studies, our source of data is research articles in international core

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LIS journals (Appendix A). This article summarizes and analyzes data concerning the years 1965 (Huusko, 1992), 1975 (Kumpulainen, 1991), and 1985 (Järvelin & Vakkari, 1990).

2. METHODS

2.1 *The classification scheme*

Article topics were classified by the classification **LIS topic** (see Appendix B). It is discussed in detail in Järvelin and Vakkari (1990). The main classes, that is, main fields of LIS research are:

01 the professions in the field of library and information service (L&I service),
02 library history,
03 publishing (incl. book history),
10 education in LIS,
20 methodology,
30 analysis of LIS,
40 L & I service activities,
50 information storage and retrieval (IS&R),
60 information seeking,
70 scientific and professional communication,
80 other aspects of LIS

Classes 40 through 70 also contained subclasses (cf. Appendix B). The classification scheme was validated for the 1985 data (Järvelin & Vakkari, 1990). Each article was classified into a single main class; in the main classes 40 through 70, only the subclasses were used for classification. Where an article had many topics, we attempted to determine its main topic. For instance, an article on education in information retrieval was classified as education and information retrieval for education as information retrieval.

The approach used in the study reported in an article was classified according to the classifications **viewpoint on information dissemination** and **social level** (see Appendix B). The classification of the viewpoint on information dissemination was based on traditionally recognized actors in the process of information dissemination (information producer, intermediary, end user, LIS educator, etc.). The use of this classification is described in more detail in Järvelin and Vakkari (1990). It is thus possible to find out, for example, the degree to which LIS research sees information seeking simply from the intermediary's viewpoint (cf. Saracevic & Kantor, 1988; Wersig, 1973).

The classification of social level differentiates between the individual, organizational, and societal levels and multi-level analyses. The class individual was used when the objects studied in the article were individuals. For example, a study on intermediary behavior through analysis of search protocols has the social level individual (NB, the data collection method does not determine the social level). The class "not applicable" was used when the objects studied in the article were at no level of social organization, for example, studies of card catalogs or indexing rules as such. The use of this classification is described in more detail in Järvelin and Vakkari (1990).

The methodological aspect of a study consists of research strategy, data collection method, type of analysis, and type of investigation (Järvelin & Vakkari, 1990). The classifications for the first two are used in this article and are given in Appendix B. Research strategy is an overall approach to the study within which, for example, the decisions concerning data collection and the type of analysis are made. Typical strategies for empirical research are, for example, historical, survey, qualitative, or experimental. The other main strategies are called conceptual research strategy (e.g., verbal argumentation, concept analysis), mathematical or logical strategy, and system and software analysis and design.

Empirical research uses empirical data derived through many different data collection methods. Typical data collection methods are questionnaires, content analysis, and historical source analysis, as listed in the classification for the variable data collection method.

Each article was classified into a one content class of each classification. The articles were divided among four classifiers, one classifying the 1965 data, one the 1975 data, and

two classifying the 1985 data. The reliability of classification between the two 1985 classifiers was ascertained by cross-classification of a random selection of about 10% of the articles followed by a partial reclassification of the articles (Järvelin & Vakkari, 1990). The reliability of classification between the data for the years 1965, 1975, and 1985 was increased by joint consideration of any problematic cases.

2.2 *The data*

If the aim is to give a representative picture of LIS research, the source data should include all research publications in the field. The criteria for what is LIS research are given in part by the classification of LIS topics: a research publication whose topic can be classified in one of its classes belongs to the domain of LIS. However, it is difficult to identify the publications which contain research fulfilling these criteria. This is a typical problem in publication-based studies (Line, 1982; O'Connor & Voos, 1981). Therefore, research publications in the field are defined ostensibly by choosing articles from the core scientific journals in LIS.

Limiting the data to journal articles may cause some bias in the study results. However, our data show that many of articles with characteristics of, for example, social and humanistic research, are published in LIS journals. The most significant research, regardless of the LIS subfield, is published in international journals. Moreover, journal articles have been the almost sole source of data in recent studies on LIS research publications (Järvelin & Vakkari, 1990).

2.2.1 *Periodization.* The 10-year time intervals of our samples cannot reflect occasional peaks between the years 1965, 1975, and 1985. However, all long-term changes in LIS research during the intervening years are reflected in the following samples. The year 1965 represents the growth and great excitement of the 60s in LIS due to the Cranfield studies, prospects of computerization, and increased funding of the post-Sputnik era. In the year 1975 the budget for L&I services and LIS research was already more stringent. Information retrieval (IR) systems and their markets were developing rapidly, and the discussion on the nature of LIS ceased (Saracevic, 1990). In the year 1985, the international markets for IR had matured, funding of traditional LIS schools was declining, and new technology (e.g., CD-ROM hypermedia) and new themes (e.g., information management) were emerging. Our sampling years themselves do not seem to be occasional peaks because the overall picture over the years is quite stable.

2.2.2 *Selection of journals.* The selection of journals is based on purposive selection (Powell, 1985, p. 70) of core journals. Core journals are such scientific LIS journals which have a wide distribution, and an international editorial board and publication policy, and which have been characterized as core journals earlier (e.g., by Feehan *et al.*, 1987; Peritz, 1981). The source data comprise the 1965, 1975, and 1985 volumes of such journals. The journal sets differ between the years, because some core journals of 1965 have ceased to exist before 1985 and new core journals have emerged since 1965. Widely distributed but clearly professional journals were excluded. The study sample contains altogether 40 journals (Appendix A). At the time of collecting the source data, the right volumes of some journals were not available. An earlier volume for those journals was used for the samples.

2.2.3 *Selection of articles and the basis of analysis.* From the journals selected, all full-length articles were included in the samples and classified as research articles or professional articles. The criterion for determining what constitutes a research article was as in the earlier studies: research is an inquiry, where the goal is to elicit, through a systematic method, some new facts, concepts or ideas (Nour, 1985; Peritz, 1981). The key concepts of method and goal help to distinguish research articles from the rest. Excluded were editorials, letters to the editor, news and news-like reviews, and advertisements. The material to be analyzed consisted of the abstract pages of the articles. When the abstract was missing, its introduction or a sufficient number of pages were used.

3. FINDINGS

The yearly samples consist of articles published in core LIS research journals, as indicated in Table 1. In the last two yearly data subsets, the proportion of research articles

Table 1. Division of the source data among article types of 1965, 1975, and 1985

	1965		1975		1985	
Article type	No.	%	No.	%	No.	%
Research articles	142	30	359	57	449	54
Professional articles	325	70	273	43	384	46
Totals	467	100	632	100	833	100

was above 50%, which demonstrates the effectiveness of the purposive selection and that the share of research articles has grown (cf. Järvelin & Vakkari, 1990). In the rest of this article, only research articles are analyzed.

3.1 *The distribution of articles over topics*

The largest body of research articles focused in each year on problems of IS&R (26%–32%), the second largest on L&I service activities (25%–27%) (Table 2). Their shares seem quite stable although there was a drop in IS&R in 1975. On other topics there were considerably fewer articles. The shares of professions (4%–5%), library history (2%–4%), publishing and book history (3%–6%), information seeking (6%–8%), and scientific and professional communication (5%–7%) were also relatively steady. Although moderate in size, the share of scientific and professional communication has grown steadily. Interest in the education in LIS had its peak in 1975 with a small decline towards 1985. The growth of "other LIS topic" from 1% to 10% is remarkable and may indicate a gradual movement from traditional to new research topics in LIS.

Methodology and analysis of LIS have lost in popularity during the 20-year period. Especially the share of methodology has dropped remarkably since 1965. Thus, it appears that the research paradigms and methodological presuppositions connected to them are considered non-problematic since the Cranfield era. The findings support the view by Saracevic (1990, p. 7) that organized attention to defining the problems and methods of LIS withered in early 1970s and revived only in the late 80s. In mid-60s, LIS was in rapid development due to increased funding, technological prospects, and advances in research. Methodology and analysis of LIS were thus essential. Later the focus may have shifted to pondering the effects on education and applications. Knowing the heterogeneity of LIS research, and the one-sided and mechanical use of methods (Dervin & Nilan, 1986; Järvelin & Vakkari, 1990), more methodological discussion and analysis of the discipline is needed.

Researchers seem to be little interested in information seeking, although the study of information seeking behaviour is, from a logical point of view, a central area of LIS. Only 6% to 8% of the articles dealt with information seeking, and the trend is descending.

Table 2. Topic distribution among main classes in the articles in 1965, 1975, and 1985 (%)

LIS topic	1965 $N = 142$	1975 $N = 359$	1985 $N = 449$
Professions	4.9	3.9	5.6
Library history	2.8	2.2	3.8
Publishing & book history	5.6	3.0	3.1
Education in LIS	2.1	6.7	4.7
Methodology	7.8	2.8	0.9
Analysis of LIS	5.6	3.3	2.4
L&I service activities	25.4	25.4	27.2
IS&R	32.4	26.2	29.2
Information seeking	7.8	5.6	6.0
Scientific and professional comm.	4.9	6.4	7.3
Other LIS topic	1.0	14.5	10.2
Totals	100.3	100.0	100.0

We shall analyze below the topic distributions in the subclasses. The figures are drawn from Appendix C.

Among the analyses of L&I service activities, the most popular subfields have been studies on collections, administration and planning, and automation. There appears a drop in interest in collection studies in the mid-70s after which the interest has revived (6.3%–2.8%–7.1%). Administration and planning have gained in popularity since 1965 (1.4%–6.4%–5.8%), whereas automation has lost (7.8%–2.2%–3.6%). The latter may have integrated into other topics so that it is nowadays hard to classify studies into automation per se.

Within IS&R, clearly the strongest emphasis was given to IR from bibliographic databases—growing from 4% to 13%—and classification and indexing—declining from 22% to 6%. The development of online IR has required concentration on the users' retrieval problems instead of classification and indexing problems. The study of nonbibliographic databases has received increasing attention toward 1985 (0%–1.1%–3.6%) as has the study of bibliographic databases since 1975 (2.1%–0.8%–4.2%). The share of cataloguing seems to decline slowly (4.2%–2.8%–3.1%).

Most research articles on information seeking have been conventional library and information services use and user studies (2.8%–1.1%–2.2%). Only in 1975 other subfields were more popular. The next most frequent were studies of the use of various channels and sources of information with a concentration on the channels (vs. on the information seeker) (2.1%–1.4%–1.3%), and studies on information seeking behaviour and information use where the viewpoint was that of the end user. All in all, it seems that LIS research concentrates on L&I service institution and their users. Only the year 1975 seems to have been broader-viewed. This supports the views by Dervin and Nilan (1986) and Peritz (1981, pp. 264–265) who report that the L&I service orientation predominated in research articles in 1950 to 1975. Thus, towards 1985, and despite of the criticism leveled at routine studies of library use (e.g., Brittain, 1975; Dervin & Nilan, 1986; Kunz, Rittel, & Schwuchow, 1977; Wersig, 1973), the situation seems not to have changed.

The study of scientific or professional publishing (2.8%–2.2%–2.2%) and citation patterns and structures (1.4%–1.4%–3.3%) were generally the most popular topics in scientific and professional communication. Only in 1975 other aspects of communication was the largest area (2.3%).

3.2 *Most frequent topics in research articles*

The summary on most popular topics in research articles in 1965, 1975, and 1985 is shown in Table 3. There are clear trends: the share of classification and indexing has reduced while the share of information retrieval has grown steadily. The analysis of LIS has

Table 3. Summary on most popular topics in the articles in 1965, 1975, and 1985 (%)

Topic	1965 $N = 142$	1975 $N = 359$	1985 $N = 449$
Information retrieval	4.2	7.8	12.7
Collections	6.3		7.1
Professions	4.9	3.9	5.6
Classification and indexing	21.8	13.6	5.6
Administration or planning		6.4	5.8
Education in LIS		6.7	4.7
Bibliographic databases/bibliographies			4.2
Library history			3.8
Automation	7.8		3.6
Non-bibliographic databases			3.6
Several interconnected L&S activities		5.3	
Circulation/interlibrary loans		3.6	
Analysis of LIS	5.6	3.3	
Methodology	7.8		
Publishing & book history	5.6		
Cataloguing	4.2		
Other L&I service activities	3.5		

lost popularity from 1965 to 1985. Classification and indexing, information retrieval, and professions are continuously among the most popular topics. Collections and automation are popular again despite of lack of popularity in 1975. Methodology, publishing, book history, and cataloguing were popular only in 1965.

3.3 *The viewpoint of information dissemination process*

The most prevalent viewpoints on information dissemination in LIS are clearly the viewpoints of intermediaries and their background organization, that is, generally the viewpoints of L&I services. As Table 4 shows, the combined share of these viewpoints is from 22% to 37%. It is notable that the share of an individual intermediary's viewpoint has a descending trend, while the intermediary organization's viewpoint has an ascending one. Next in order was a combination of several viewpoints (6%–12%). Also, the producer's viewpoint (1%–9%–10%) and the end user's viewpoint (11%–5%–8%) were almost equally frequent in the research articles—the former with an ascending trend reflecting the development of the information markets, and the latter with a descending trend. The developer's viewpoint had its peak in 1975 when online systems were developed. The high percentages of articles with "not applicable" viewpoints are explained by the number of studies not related to the dissemination process but instead, for example, to technical details.

Has the formation of LIS meant limitation of viewpoints to that of L&I services? It can be argued that the 60s and the 70s have brought new scholars to the LIS area from other disciplines. If the 80s have brought new scholars through the LIS schools and curricula, it is possible that the LIS paradigm, unhappily, narrows the viewpoint to that of L&I services.

3.4 *Social level*

In about half of the research articles, it was not possible to determine the social level (Table 5). This is partly due to the fact that many of the articles dealt with the tools and methods of the LIS area and were therefore often indifferent with regard to social level.

Most frequently, problems were discussed on the organizational level (19%–26%). This is a consequence, on the one hand, of the nature of the professional activity underlying the discipline, and on the other hand, of the institution-oriented viewpoint. The individual level seems more popular than the societal one (13%–17% vs. 1%–9%). For research at the individual level, there are also more established research methods than for research at the societal level. However, the organizational and societal levels have increased their share constantly from 1965 to 1975.

Multi-level analyses are rare through the years. However, many problems in the field are of such a nature that multi-level analysis of phenomena would be fruitful (see Järve-

Table 4. Viewpoint on information dissemination phase in the articles in 1965, 1975, and 1985 (%)

Viewpoint	1965 $N = 142$	1975 $N = 359$	1985 $N = 449$
Several interconnected phases	8	6	12
Producer's viewpoint	1	9	10
Seller's viewpoint	0	0	*
Intermediary's viewpoint	14	4	8
Intermediary organization's viewpoint	21	18	29
End-user's viewpoint	11	5	8
End-user organization's viewpoint	1	1	2
Developer's viewpoint	7	14	6
Educator's viewpoint	1	5	4
Other viewpoint	5	1	1
Not applicable	31	36	20
Totals	100	99	100

*Indicates <0.5%.

Table 5. Social level in the articles in 1965, 1975, and 1985 (%)

Social level	1965 $N = 142$	1975 $N = 359$	1985 $N = 449$
Individual	13	15	17
Organizational	19	22	26
Societal	1	8	9
Multi-level	0	4	3
Not applicable	66	51	45
Totals	99	100	100

lin & Vakkari, 1990). It would require, at the outset, considering the phenomena of the library and information service field from a viewpoint other than that of the institution.

3.5 *Research strategies*

Empirical research strategies were predominant, accounting for about half the total, but a growing share, of all research articles (Table 6). Fairly frequent (23%–29%) was the conceptual strategy, which has lost slightly in popularity. System and software analysis and design was used in 9% to 15% of the articles. Its high proportion is due to its popularity in research on IS&R, as will be shown later. The growth of its share among the strategies from 1965 to 1975 is explained by the intensive development of online IR systems, beginning in late 60s and early 70s. Purely formal, mathematical or logical strategies were applied only in 3 to 4% of the articles. Some literature reviews were analytic to a degree that contributed new scientific knowledge.

Of empirical strategies, the most frequent was the survey (20%–23%). This corresponds to the results of Feehan *et al.* (1987, p. 180) who reported a 20% share for survey in the 1984 articles. The share of surveys among all empirical research strategies was as high as 40 to 46% in our data, and this suggests that it is applied even in cases where other more valid and fruitful strategies are available. Bibliometric strategies have become continuously more popular (from 0.7 to 4.2%), whereas experiments become rare after 1975. The share of other empirical methods has grown. Otherwise, the changes among the empirical research strategies are minor.

Empirical qualitative methods were very rare (0%–1.6%). Also, the case method and action research may be regarded as qualitative. They were applied in 2% to 3.8% of the studies. All in all, qualitative methods were little used. This has been the rule also in social science research in general in the 60s and early 70s (e.g., Turner, 1989). After 1975,

Table 6. Research strategies in the articles in 1965, 1975, and 1985 (%)

Research strategy	1965 $N = 142$	1975 $N = 359$	1985 $N = 449$
Empirical research strategy	48.5	50.7	56.0
historical method	10.6	12.5	10.7
survey method	22.5	20.3	22.9
qualitative method	0.7	0.0	1.6
evaluation method	6.3	8.6	5.6
case or action research method	2.8	2.0	3.8
content or protocol analysis	0.0	0.0	1.1
citation analysis	0.0	2.0	3.3
other bibliometric method	0.7	1.1	0.9
experiment	3.5	3.9	1.6
other empirical method	1.4	0.3	4.5
Conceptual research strategy	28.9	28.7	23.4
Mathematical or logical	3.5	4.2	2.7
System/software analysis/design	9.2	14.8	14.5
Literature review	4.9	0.6	2.7
Other	4.9	1.1	0.0
Totals	99.9	100.1	99.3

qualitative methods have gained in popularity in social sciences, but in LIS this trend is weak.

The share of bibliometric methods corresponds quite well to earlier findings. According to Peritz (1981, p. 256), their share was slightly under 5% from 1965 to 1975. According to Feehan *et al.* (1987, p. 180), their share in 1984 was a little over 3%.

Historical method was employed in 10.6 to 12.5% of all articles. For a long time, it was the only scientific method for dealing with problems in the field (cf. Vakkari, 1986). Only in the 1950s and later it did begin to lose ground. According to Peritz (1981, p. 256), its share of all research strategies has gone down from 28% in 1950 to only 13% in 1975. In 1980, its proportion was 7% (Nour, 1985, p. 268). The figures match quite well and indicate that the tradition of historical method is still fairly strong in LIS.

In summary, LIS research is dominated by few research strategies. For example, among the empirical strategies the combined share of survey and historical methods has been constantly around two-thirds.

3.6 *Methods of data collection*

The choice of data collection method naturally reflects the research strategy selected by the investigation. Questionnaires and interviews were used most frequently, which is explained by the survey's popularity (Table 7). Next in the order of popularity were methods of historical source analysis (11–13%) and other methods of collecting data (9–19%). Data collected earlier was utilized in 4 to 6% of the articles. This includes, besides statistical data, all kinds of data available from the library collections. Rarely used methods of data collection included observation, thinking aloud, content analysis, citation analysis, and combining several methods of data collection. The most important change during the period is a drop in the share of questionnaire and interview methods in 1975, and the peak of combining several methods of data collection in 1975.

3.7 *The application of strategies on topics*

Survey, conceptual, and historical strategies were, as a rule, the most popular strategies within the topics (Table 8). Notable exceptions from this rule are IS&R with the dominance of system/software analysis/design, and scientific and professional communication with citation analysis. The former has moved from conceptual strategy to system/software analysis/design and the latter from conceptual analysis to citation analysis as the main strategy.

More than half of the studies concerning the professions of education (except in 1975) and information seeking utilized the survey strategy. The number of surveys seems unexpectedly large here. Especially with regard to articles concerning information seeking, where surveys accounted for 67 to 80%, this suggests one-sided strategies and problem formulations. For new influences in the research on information seeking, qualitative strategies research methods, such as theme interview, participant observation, and action research, are necessary.

Table 7. Data collection methods in the research articles in 1965, 1975, and 1985 (%)

Data collection method	1965 $N = 142$	1975 $N = 359$	1985 $N = 449$
Questionnaire, interview	17	11	17
Observation	0	2	1
Thinking aloud	0	0	0
Content analysis	0	2	2
Citation analysis	0	2	4
Historical source analysis	11	13	11
Several methods of collecting	2	7	2
Use of data collected earlier	4	6	5
Other method of collecting	19	9	15
Not applicable	48	48	43
Totals	101	100	100

Table 8. Most popular research strategies in LIS topics in 1965, 1975, and 1985 (%)

		1965 $N = 142$		1975 $N = 359$		1985 $N = 449$	
LIS topic	Pop	Strategy	%	Strategy	%	Strategy	%
Professions	I	Survey	71	Survey	50	Survey	52
	II	Histor/concept	14	Conceptual	36	Other empiric	12
	III	–		–		Cons/experim	8
Library history	I	Historical	75	Historical	88	Historical	100
	II	–		Conceptual	13	–	
	III	–		–		–	
Publishing & book history	I	Historical	75	Historical	82	Historical	50
	II	Survey/other	13	Survey	18	Survey	21
	III	–		–		–	
Education in LIS	I	Survey	67	Conceptual	42	Survey	57
	II	Conceptual	33	Survey	38	Conceptual	14
	III	–		–		–	
Methodology	I	Mathematical	36	Conceptual	80	Conceptual	75
	II	Experim/syst	27	Mathematical	20	–	
	III	–		–		–	
Analysis of LIS	I	Conceptual	100	Conceptual	67	Conceptual	55
	II	–		–		Survey	18
	III	–		–		–	
L&I service activities	I	Survey	36	Conceptual	31	Conceptual	28
	II	System/softw	14	Survey/system	22	Survey	25
	III	Other empiric	11	–		Historical	13
IS&R	I	Conceptual	50	System/softw	34	System/softw	31
	II	Eval/system	11	Conceptual	20	Conceptual	29
	III	–		–		Evaluation	12
Information seeking	I	Survey	73	Survey	80	Survey	67
	II	–		Conceptual	10	Conceptual	11
	III	–		–		System/softw	11
Sci. & prof. comm.	I	Conceptual	43	Citation anal.	30	Citation anal.	39
	II	Historical	29	Survey	22	Conceptual	21
	III	–		Conceptual	17	Survey	15
Other empirical LIS topic	I	Historical	100	Historical	40	Conceptual	30
	II	–		Conceptual	25	System/softw	20
	III	–		Survey	13	Other empiric	13

Legend: I = most popular strategy; II = second most popular strategy; and III = third most popular strategy. Conceptual = conceptual strategy, Evaluation = evaluation strategy, Mathematical = mathematical/logical..., Survey = survey strategy, Cons/experim = conceptual/experimental, Eval/system = evaluation and system/softw..., Survey/other = survey and other empirical, Citation anal = citation analysis, Historical = historical strategy, Other empiric = other empirical strategy, System/softw = system/software anal..., Experim/syst = experimental and system/softw..., Histor/concept = historical and conceptual strategies, Survey/system = survey and system/softw..., – = no other strategy or many strategies of this rank.

Library history and publishing and book history are, understandably, dominated by the historical strategy, as are methodology and analysis of LIS by the conceptual strategy. With regard to other topics, the use of different strategies is more evenly distributed. In the research on IS&R, system/software analysis/design and conceptual strategy account for more than a half of the strategies through the years. The systems constructed are to some extent also evaluated. This is the only group of topics where evaluation is among the three most popular strategies. In the research in L&I service activities, the research strategies are more evenly distributed with survey, conceptual, and system/software analysis/design strategies on top. Beginning in 1975, survey has lost its leading position to the conceptual strategy. Thus L&I service institutions are studied more and more through verbal argumentation, which is the most frequent substrategy of the conceptual strategy.

In the research on scientific communication the use of strategies is versatile. The emphasis on citation analysis, conceptual strategies, and survey seems well-founded considering the types of questions posed here.

3.8 *The viewpoint on dissemination process in LIS topics*

The professions within L&I services are most often not seen from any viewpoint on information dissemination. However, in 1985 the intermediary's viewpoint becomes dominant. This together with the viewpoint of the intermediary organization was chosen in 64% of the articles that dealt with this topic in 1985 (Table 9).

In articles concerning library history, very frequently no viewpoint was relevant. Among extant viewpoints, the intermediary organization's viewpoint (12–25%) was quite frequent. In articles concerning publishing, the producer's viewpoint (13–45%) and the viewpoint on several phases (9–38%) appeared frequently.

Education was in 67 to 81% of the articles studied from the educator's viewpoint. The viewpoint of end users, whom the educated intermediaries will serve, was rare, as was the viewpoint of intermediary organizations. The topics of methodology and analysis of LIS, understandably, had most often (70–100%) no viewpoint on information dissemination.

Research on L&I service activities was carried out most often from the viewpoint of the intermediary organization (52–70%). Combined with the intermediary's viewpoint, the

Table 9. Most popular viewpoint on information dissemination in LIS topics in research articles in 1965, 1975, and 1985 (%)

		1965		1975		1985	
LIS topic	Pop	Viewpoint	%	Viewpoint	%	Viewpoint	%
Professions	I	Not appl.	71	Not appl.	86	Int. med.	48
	II	Int. med.	29	Im & io	7	Not appl.	36
	III	–		–		Int. org.	16
Library history	I	Not appl.	75	Not appl.	88	Not appl.	41
	II	Int. org.	25	Int. org.	12	Many	29
	III	–		–		Int. org.	24
Publishing & book history	I	Many/not appl.	38	Producer	45	Not appl.	43
	II	Producer	13	Not appl.	36	Many	21
	III	Other	13	Many	9	Producer	21
Education in LIS	I	Educator	67	Educator	71	Educator	81
	II	Other	33	Not appl.	25	Int. med.	10
	III	–		Int. org.	4	Int. org.	5
Methodology	I	Not appl.	82	Not appl.	70	Not appl.	100
	II	Developer	18	Int. med.	20	–	0
	III	–		Int. org.	10	–	0
Analysis of LIS	I	Not appl.	75	Not appl.	100	Not appl.	82
	II	Many	13	–		Many	18
	III	Other	13	–		–	
L&I service activities	I	Int. org.	62	Int. org.	52	Int. org.	70
	II	Not appl.	11	Not appl.	34	Many	9
	III	Int. med.	8	Many	5	Int. med.	6
IS&R	I	Int. med.	28	Developer	44	Producer	26
	II	Not appl.	25	Producer	23	Int. org.	17
	III	End user/devel.	13	Not appl.	14	Developer	17
Information seeking	I	End user	64	End user	45	End user	41
	II	Int. org.	27	Many	20	Int. org.	26
	III	Many	9	Int. org.	15	Developer	11
Sci. & prof. comm.	I	Int. med./not appl.	29	Not appl.	35	Not appl.	33
	II	Many/prod/user	14	Producer	22	Many	27
	III	–		Many	17	Producer	12
Other LIS topic	I	Not appl.	100	Not appl.	60	Not appl.	43
	II	–		Developer	12	Many	28
	III	–		Int. org.	10	Int. org.	15

Legend: I = most popular; II = second most popular; and III = third most popular viewpoint. Many = wp on several interconnected phases, Int. med. = intermediary's wp, Im & io = intermediary's and intermediary organization's wp both, Educator = educator's wp, Many/prod/user = the three indicated each, Producer = information producer's wp, Int. org. = intermediary organization's wp, End user = end-user's and end-user organization's wp, Developer = process/service developer's wp, Not appl. = no wp on information dissemination, – = no other strategy or many strategies of this rank.

percentage range becomes 52 to 76%. The end user's viewpoint was adopted in only 4% of the articles in 1985 (Järvelin & Vakkari, 1990).

IS&R was also studied from the viewpoints of producers, intermediaries, and developers. These were followed by the viewpoint of the end user, represented in 1965 and 1985 by 13% of the articles. Although this was a small proportion, it was still considerably larger than in other areas. Developer's viewpoint as the dominant viewpoint has lost its position; intermediary organizations as a viewpoint seems to have gained.

It is only in the area of research on information seeking that the end user's viewpoint was primary (41–64%) but with a declining trend. The intermediary organization's viewpoint was also frequent. Particularly in research on information seeking, several writers have for a decade argued against approaches centered on library and information services (e.g., Brittain, 1975; Kunz *et al.*, 1977). This seems to bear fruit, although the institutional viewpoint is still prevalent in a great deal of research. The rise of the developer's viewpoint in 1985 may reflect rise of information management type of research, although information management itself was not a frequent topic in the sample.

The majority of articles on L&I services and IS&R were written with a viewpoint other than that of the end user's. Moreover, it seems that the end user's viewpoint is losing in popularity. This suggests that the central services in the field are studied and developed using a viewpoint other than that of the service user. Outside these core areas of the profession, problems were more often seen from viewpoints other than the intermediary's alone.

4. DISCUSSION

The main finding from the article samples for the years 1965, 1975, and 1985 is the remarkable similarity of the distributions. Although there are interesting changes in topics and methods, the main lines indicate that the foci of LIS have not changed greatly from 1965 to 1985. The relative sizes of the main fields of LIS are the same, with IS&R as the largest study area and L&I service activities as the second largest. Together they have accounted for over 50% of the research. The relative size of any other field of LIS is below 10%.

With regard to the theoretical and practical importance of research on information seeking, only a small proportion of the articles contributed to this area. Its share was constantly 6 to 8% of research articles, and has since 1975 been much smaller than the share of the subfield IR. The issues in LIS seem to be studied and developed without going deeply into the needs and information seeking patterns of the users.

The methodology of research in the field and the analysis of LIS have received little attention, and their shares have dropped dramatically. LIS research seems also rather one-sided in its use of empirical methods, which suggests one-sidedness in its theoretical assumptions and problem formulations. It seems that the scope and methods of LIS are more and more seen as unproblematic. This implies that a certain view about the nature and procedures of research has at least partly crystalized within the LIS research community.

However, both methodological discussion and analysis of the foundations of the discipline are a prerequisite for a more varied use of research strategies and a more general articulation of research problems. These topics should, therefore, receive more attention. This conclusion is strengthened by the scarcity of concept analysis as a research strategy—the vast majority of articles using conceptual analysis were based on verbal argumentation instead of strict concept analysis (Järvelin & Vakkari, 1990). Otherwise, it is not possible to increase the conceptual clarity of LIS theories (cf. Schrader, 1986). Although empirical studies and articles containing verbal argumentation may contain some conceptual analysis, they do not make up for the lack of more general analysis on basic concepts of the field. Conceptual analysis, too, should be more frequent, in order to clarify the conceptual basis of LIS (cf. Schrader, 1986).

Interesting changes appear also between the subfields. The growth of IR is remarkable as is the relative decline of classification and indexing. The development of online IR has required concentration on the users' retrieval problems instead of classification and indexing. The study of all types of databases has increased since 1975.

The research strategies in the articles centered mainly on survey, conceptual analysis, and systems and software analysis and design, of which survey was clearly the most popular. Qualitative methods and experiments were little used. In spite of the fact that in other social sciences their share has increased sharply, this is not the case in LIS. They would probably reveal facts for which the survey is inadequate (cf. Dervin & Nilan, 1986). The application of research strategies on topics strengthens the general conclusions. The research strategies in LIS are in many research areas strongly concentrated on only a few strategies.

Because the choice of strategy is a consequence of the theoretical choices and problem definitions of the study, it is obvious that even the latter are fairly one-sided in LIS. Especially the lack of qualitative methods is a symptom of the narrowness of the way questions are posed in research. The use of experiments, too, was rare. This suggests that there are notable limitations in the nature of knowledge acquired through research. Bringing in new methods would enrich also theoretical elaborations and problem formulations in our field of research.

Research problems were most often (18–29%) seen from the viewpoint of the intermediary organization, that is, the L&I service institution. Through the years, this viewpoint has grown stronger. The end user's viewpoint was adopted in only 5 to 11% of the articles. The differences in viewpoint emphasis were particularly clear in the two largest research fields. In the research on L&I services, 52 to 70% of the articles dealt with their object from the viewpoint of the intermediary organization, and only 4 to 13% from that of the end user. Thus, in the main fields of LIS, the institutional viewpoint is emphasized instead of the end user's viewpoint. Only in research into information seeking was the proportion of the articles emphasizing the end user's viewpoint larger than that of the other viewpoints. Even here, the share of the end user's viewpoint was declining. This may be the case because the discipline was born out of professional practice and is therefore intimately connected with its problems. The curricula and orientation of LIS schools until 1985 may have increased this narrow orientation.

There is a growing need for a broader view in LIS giving more emphasis on the human component in information systems and on information ecology in social contexts (e.g., Dervin & Nilan, 1986; Saracevic, 1990). Judging from our findings, the best way of improving the quality and enriching the research in LIS is to go beyond one-sided attachments to institutions or information systems.

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APPENDIX A: LIST OF JOURNALS

Journal Name	1965	1975	1985
Aslib Proceedings	x	x	x
Bibliotek. Forschung und Praxis			x
Biblos	x		x
College and Research Libraries	x	x	x
Drexel Library Quarterly	x	x	x
The Indexer	x	x	x
Informatik	x	x	x
Information Processing and Management (Inform. Storage and Retrieval)	x	x	x
Information Services and Use, 1984			x
Information Technology and Libraries, 1983 (J. Library Automation)		x	x
International Cataloguing		x	x
International Classification		x	x
International Forum on Information and Documentation		x	x
Social Science Information Studies (Int. J. of Information Management)			x
International Library Review		x	x
Journal of the American Society for Information Science (Amer. Docum.)	x	x	x
Journal of Documentation		x	x
Journal of Educ. for Librarianship (83/84, J. of Educ. for Lib. and Inf. Sci.)		x	x
Journal of Information Science (The Information Scientist)		x	x
Journal of Librarianship		x	x
Journal of Library Administration			x
Journal of Library History, 1984		x	x
Library and Information Science Research			x
Library History, 1982–84, Vol. 6		x	x
Library Quarterly	x	x	x
Library Resources and Technical Services	x	x	x
Library Science with a Slant to Documentation	x	x	
Library Trends	x	x	x
Libri	x	x	x
Nachrichten für Dokumentation	x	x	x
Online			x
Online Review			x
The Papers of the Bibliographical Society of America	x	x	x
Program		x	x
Reference Quarterly	x	x	x
Scientific and Technical Information Processing		x	
Special Libraries, 1984			x
Unesco J. for Inform. Sci., Librarianship and Archives Admin., 1983	x		x
Zeitschrift für Bibliothekswesen und Bibliographie		x	x
Zentralblatt für Bibliothekswesen		x	

APPENDIX B: THE CLASSIFICATION SCHEME

LIS topic

A. 01 Professions
02 Library history
03 Publishing and book history
10 Education in LIS
20 Methodology

30 Analysis of LIS
40 *Research on L&I service activities*
Study on . . .
41 . . . Circulation or interlibrary loans
42 . . . Collections
43 . . . Inf. or ref. service
44 . . . User education
45 . . . Buildings or facilities
46 . . . Administration of planning
47 . . . Automation (except when concerned with some particular activity 41–46)
48 . . . Other L&I service activities
49 . . . Several interconnected L&I activities
50 *Research in IS&R*
Study on . . .
51 . . . Cataloguing
52 . . . Classification and indexing (process or languages)
53 . . . Information retrieval
54 . . . Bibliographic databases or bibliographies
55 . . . Nonbibliographic data bases (textual, numeric . . .)
60 *Research on information seeking*
Study on . . .
61 . . . Information dissemination
62 . . . The use/users of information channels/sources (focus on channels/sources)
63 . . . The use of L&I services (no other channels considered)
64 . . . Information seeking behavior (focus on persons)
65 . . . Information use (whether (and how) used)
66 . . . Information management
70 *Research on scientific and professional communication*
Study on . . .
71 . . . Scientific or professional publishing
72 . . . Citation patterns and structures
73 . . . Other aspects of communication
80 Other LIS Topic
90 Other study (other discipline)

Approaches
Viewpoint on information dissemination.

P. 10 study on several interconnected phases of dissemination
11 information producer's (originator's) viewpoint
12 information seller's (marketer's viewpoint)
13 intermediary's viewpoint
14 intermediary organization's viewpoint
15 end-user's viewpoint
16 end-user organization's viewpoint
17 process/service developer's viewpoint (prefer alternatives above)
18 LIS educator's viewpoint
19 other viewpoint
00 not applicable

Social level.

S. 1 Individual
2 Organizational
3 Societal

4 Multi-level
0 Not applicable

Methods

Research strategy.

M. 10 *Empirical research strategy*
11 Historical method
12 Survey method
13 Qualitative method
14 Evaluation method
15 Case or action research method
16 Content or protocol analysis
17 Citation analysis
18 Other bibliometric method
21 Secondary analysis
22 Experiment
29 Other empirical method
30 *Conceptual research strategy*
31 Verbal argumentation, criticism
32 Concept analysis
40 Mathematical or logical method
50 System/software analysis/design
60 Literature review
70 Discussion paper
80 Bibliographic method
90 Other method
00 Not applicable, no method

Data collection method.

C. 1 Questionnaire, interview
2 Observation
3 Thinking aloud
4 Content analysis
5 Citation analysis
6 Historical source analysis
7 Several methods of collecting
8 Use of data collected earlier
9 Other method of collecting
0 Not applicable

APPENDIX C: DETAILS OF TOPIC DISTRIBUTIONS

Research topics in research articles in 1965, 1975, and 1985 (%)

Topic	1965 $N = 142$	1975 $N = 359$	1985 $N = 449$
Professions	4.9	3.9	5.6
Library history	2.8	2.2	3.8
Publishing & book history	5.6	3.0	3.1
Education in LIS	2.1	6.7	4.7
Methodology	7.8	2.8	0.9
Analysis of LIS	5.6	3.3	2.4
L&I service activities	25.4	25.4	27.2
Circulation or interlibrary loans	2.8	3.6	2.9
Collections	6.3	2.8	7.1

continued

Appendix C continued

Topic	1965 $N = 142$	1975 $N = 359$	1985 $N = 449$
Inf. or ref. service	0.7	3.0	2.7
User education	0.7	0.0	0.9
Buildings and facilities	0.7	0.0	0.2
Administration or planning	1.4	6.4	5.8
Automation	7.8	2.2	3.6
Other L&I service activities	3.5	1.9	1.1
Several interconnected L&I activities	1.4	5.3	2.9
IS&R	32.4	26.2	29.2
Cataloguing	4.2	2.8	3.1
Classification and indexing	21.8	13.6	5.6
Information retrieval	4.2	7.8	12.7
Bibliographic databases or bibliographies	2.1	0.8	4.2
Non-bibliographic databases	0.0	1.1	3.6
Information seeking	7.8	5.6	6.0
Information dissemination	0.0	0.8	0.7
The use/users of inf. channels/sources	2.1	1.4	1.3
Use of L&I services	2.8	1.1	2.2
Information seeking behavior	1.4	1.9	0.7
Information use	0.0	0.3	0.9
Information management	1.4	–	–
Scientific and professional comm.	4.9	6.4	7.3
Scientific or professional publ.	2.8	2.2	2.2
Citation patterns and structures	1.4	1.4	3.3
Other aspects of comm.	0.7	2.3	1.8
Other LIS topic	1.0	14.5	10.2
Totals	100.3	100.0	100.4