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Journal bibliometric analysis: a case study on the *Journal of Documentation*

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Abstract

Purpose – This study aims to explore the journal bibliometric characteristics of the *Journal of Documentation* (*JOD*) and the subject relationship with other disciplines by citation analysis.

Design/methodology/approach – The citation data were drawn from references of each article of *JOD* during 1998 and 2008. *Ulrich's Periodicals Directory*, Library of Congress Subject Heading, retrieved from the WorldCat and LISA database were used to identify the main class, subclass and subject of cited journals and books.

Findings – The results of this study revealed that journal articles are the most cited document, followed by books and book chapters, electronic resources, and conference proceedings, respectively. The three main classes of cited journals in *JOD* papers are library science, science, and social sciences. The three subclasses of non-LIS journals that were highly cited in *JOD* papers are Science, "Mathematics. Computer science", and "Industries. Land use. Labor". The three highly cited subjects of library and information science journals encompass searching, information work, and online information retrieval. The most cited main class of books in *JOD* papers is library and information science, followed by social sciences, science, "Philosophy. Psychology. Religion." The three highly cited subclasses of books in *JOD* papers are "Books (General). Writing. Paleography. Book industries and trade. Libraries. Bibliography," "Philology and linguistics," and Science, and the most cited subject of books is information storage and retrieval systems.

Originality/value – Results for the present research found that information science, as represented by *JOD*, is a developing discipline with an expanding literature relating to multiple subject areas.

Keywords Journal bibliometric study, Cited books, Cited journals, Subject analysis, Bibliographic systems, Information science, *Journal of Documentation*

Paper type Case study



1. Introduction

Bibliometric techniques using references made to other documents can be applied to establish statistical models of scholarly communication flow. For example, citations can be used to map relationships between documents, between journals or other channels of scholarly communications. It also can be clustered to identify the flow of topics within and among disciplines (Borgman, 1999, p. 118). Indeed, citation analysis is an important area of library and information science. From the studies of citation

analysis, one can learn which scholars from which disciplines cite which articles? Which journals are cited more often? Which disciplines cite the journals of other disciplines? The results of citation analysis are used for many purposes, for example, to determine the impact of specific articles or journals on subsequent research and to document the interdisciplinary applicability of various journals (Desai, 2003; Harter, 1996).

The purpose of this study is to analyze the characteristics of cited references in the *Journal of Documentation (JOD)*, which has been recognized as one of the most important journal sources in the field of information science. As addressed in the scope of *JOD*, it has been recognized a general-purpose journal, which publishes articles about and from most areas of the discipline. As one of leading journals in library and information science, such a study may help to understanding the interactions among the disciplines relating to information science.

Indeed, as is well-accepted, information science is an interdisciplinary science evolving from the interactive of many other disciplines. Borko (1968, p. 3) defined that information science is “a discipline that investigates the properties and behavior of information, the forces governing the flow of information, and the means of processing information for optimum accessibility and usability. He also commented that information science is an interdisciplinary science derived from and related to such fields as mathematics, logic, linguistics, psychology, computer technology, operations research, the graphic arts, communications, library science, management, and other similar fields”. Saracevic (1999, p. 1,052) examined the origin of information from various perspectives and dealt with the relation of information science to other fields from several aspects, including historical, sociological, philosophical, technological, educational, and interdisciplinary. He also revealed that “information science is interdisciplinary in nature”, “is connected to information technology” and is “an active participant in the evolution of the information society with a strong social and human dimension, above and beyond technology”.

In the literature, there have been some bibliometric studies on the cited reference of a particular journal in information science. *Journal of the American Society for Information Science and Technology (JASIST)* was probably the one most studied. Meadow and Zaborowsk (1979) conducted some statistical analyses on the citation patterns of the 1978 edition of *JASIS* and found that most of *JASIS* authors (43 out of 54) came from the USA. They also identified the top ten most frequent journals cited by *JASIS* and the most frequent subjects covered by *JASIS* authors. Persson (1994) explored the intellectual base and research fronts of *JASIS*, from 1986 to 1990, based on a citation analysis, to study the structure of the field of information science. A total of 209 articles published in the *JASIS* were selected as the document set from SSCI CD-ROM. His co-citation analysis revealed that an intellectual base was renewing slowly. The intellectual base of information science had two major clusters, bibliometrics and information retrieval. Citation analysis and bibliometric distributions are two groups of bibliometric cluster and information retrieval cluster could be subdivided in one “hard” part working on algorithms and one “soft” part concentrating on the user-system relation. Smith (1999) explored how *JASIS* has developed over the past 50 years. One of her research topics was an analysis of the linkage between *JASIS* and other publications (which journals *JASIS* authors most often cite and which journals most often cite *JASIS*). She then identified the top most

frequently cited journals by the authors of *JASIS*. Lipetz (1999) studied many bibliometric aspects of papers in *JASIS* by examining volume of 1955, 1965, 1975, 1985 and 1995. One of his findings revealed that the number of scholarly papers published per year in *JASIS* has grown exponentially from 21 to 68. From 1955 to 1965, the average number of citations per paper dropped from 8.3 to 7.0; but the ratio increased exponentially thereafter to 30.5 in 1995.

DeHart (1992) studied the end-of-article references appeared in issues, published in 1987-1990, of *Information Processing & Management (IPM)*, *Journal of the American Society for Information Science (JASIS)*, and *Journal of Documentation (JD)* to identify monographs cited. The percentage of monographic reference to all references in *IPM*, *JASIS* and *JD* were 21 percent, 19 percent and 26 percent, respectively. He also identified the five most frequently cited authors and subjects, involving 20 different books, are G. Salton, CM. van Rijsbergen, R. Schank, M. Kochen, and F. Machlup. The five subjects appearing most often are:

- (1) information storage and retrieval systems (72 times);
- (2) artificial intelligence;
- (3) discourse analysis;
- (4) database management; and
- (5) human-computer interaction.

Based on analyses of references in journal articles and journal co-citation analyses, Nebelong-Bonnevie and Frandsen (2006) proposed the journal citation identity (i.e. references per different referenced work) and journal citation image as two indicators for journal evaluation. They analyzed *Journal of Documentation (JOD)* by using the data of *Journal of Information Science (JIS)* and *Journal of the American Society for Information Science and Technology (JASIST)* as standard of reference and comparison. The results demonstrated, from 1990 to 2003, the average journal citation identify for *JOD*, *JIS*, *JASIST* were 1.5, 1.44 and 1.88, respectively. Low ratios for *JIS* and *JOD* indicate that *JIS* and *JOD* have slightly greater diversity of journals in their references compared to *JASIST*. They also found that *JOD* has a higher degree of book reviews and thus a lower share of scientific-content documents than *JASIST* and *JIS*. For self-citing aspect, *JASIST*, with an average self-citing rate of 4.3 percent ranked first, followed by *JOD* and *JIS* with rate of 3.9 percent and 3.4 percent, respectively. For self-cited rate, *JOD* showed a lower rate than the two other journals. The journal co-citation analysis indicated that *JASIST* and *JIS* were the two journals closest to *JOD* and the image of *JOD* was influenced, especially, by *JASIST* and *IPM* with an upward tendency and to a less degree by *JIS*.

2. Research questions and methods

The literature review above reveals that most previous studies were on the bibliometric analysis of *JIS*, *JOD*, *IPM*, and *JASIS(T)*. However, subject analysis on the references cited had been seldom studied. The objective of the present study is to analyze the characteristics of cited references in *JOD* from 1998-2008. A review of *JOD*'s references could be very helpful in understanding the relations between *JOD* and other subject disciplines. The present work focuses on the subject of references contained in the papers published in *JOD*, and reports on a survey of various aspects of *JOD* published

from 1998 to 2008. The present study will identify the amount of journals and books cited and analyze the subject matter of these publications and it may be somewhat a reflection of the disciplines it represents. The research problems include:

- (1) What types of document have been cited by *JOD*?
- (2) What main class and sub-class are for the cited journals?
- (3) What subjects are for the cited journals for Library and Information Science?
- (4) What main class, sub-class and subject are for the cited books?

This study explores the distribution and subjects of references in *JOD* during 1998 and 2008. There are 881 papers in *JOD* in 11 selected years, and their document types are shown in Table I. Since this study aims to investigate papers with references, such as Articles and Reviews, 354 papers were selected for further exploration.

This study retrieved main class and subclass of cited journals from *Ulrich's Periodicals Directory* and OCLC WorldCat on the basis of Library of Congress Classification (LCC). The classification was mainly based on LCC, and supplemented with Dewey Decimal Classification (DDC). In LCC, the first character symbolizes the main class, and second character represents subclass. If journals were classified by DDC, the corresponding LCC number would be examined according to the Dewey-LC Conversion table made by OCLC. If the corresponding LCC number could not be found, the data would not be analyzed. However, the main class, subclass and the subject of cited books were identified by LCC and Library of Congress Subject Headings (LCSH) searching from OCLC WorldCat.

3. Results and discussion

3.1 Total published articles references

Table II shows the numbers of references that authors cited in their *JOD* papers. There were 354 papers with total 14,174 references in *JOD* in 11 selected years, and the average number of references cited per *JOD* paper was 40. Averagely there were 1,289 references cited per year, and the total number almost increased yearly.

3.2 Document type of cited literature

There are 1,253 journals cited by the *JOD*, constituting 6,939 cited times. The top five cited journals are *Journal of the American Society for Information Science and Technology* (12 percent), *Journal of Documentation*, *Information Processing and*

Document type	Papers
Article	336
Review	18
Editorial	34
Correction	1
Letter	4
Memorial	1
Reprint	11
Book review	476
Total	881

Table I.
Document types of
papers in *JOD* in 11
selected years

Table II.
Total references cited in
JOD papers in 11 selected
years

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total	Average
References	842	979	1,197	1,411	1,200	1,182	1,097	1,417	1,215	1,739	1,895	14,174	1,288.5
%	5.9	6.9	8.4	10.0	8.5	8.3	7.7	10.0	8.6	12.3	13.4	100.0	

Management, Scientometrics, Journal of Information Science. The self-citation rate for the *JOD* is 10 percent.

In Table III, one can observe some aspects of document type for the references cited in *JOD* in the 11 particular years of this study. Journal articles were the most cited document (46 percent), followed by books and book chapters (26.8 percent), electronic resources (13.1 percent), conference proceedings (8.5 percent). The rest of document types accounted for 4.7 percent of the cited references only. The electronic resources consisted of e-dissertation (0.0 percent, eight references), e-book (0.2 percent, 27 references), e-journal (3.0 percent, 419 references), e-conference (1.4 percent, 192 references), and web (8.5 percent, 1211 references).

3.3 Main class and subclass of cited journals

Totally there were 19 main classes of journals cited in *JOD* papers as shown in Appendix 1 (Table AI). The top ten main classes are listed in Table IV, and "Library Science. Information Resources" is the major one (64.1 percent). The second highly cited journals were that of classified under Science (11.7 percent). This table suggests that Library Science is the most cited class of journals, and followed by Science and Social sciences.

On the other hand, there were 92 subclasses (see Appendix 1 Table AI) of journals cited in *JOD* papers. Table V presents the top ten subclasses of non-LIS journals cited in *JOD* papers. The major subclass is "Science (General)" (6.8 percent), and followed by "Mathematics. Computer science" (3.7 percent). It should be noted that computer science is classified in the mathematics class. Generally speaking, the result agreed with that of main classes. Papers published in *JOD* tended to cite journals dealing with science and computer science, but also social sciences and medicine.

3.4 Subjects of cited journals for LIS

By examining the descriptor field of each record in the *Library and Information Science Abstract (LISA)* database, Table VI illustrates the percentage, in descending order, of cited frequency for each subject term of 4,378 library and information science papers cited by *JOD* of this study. There were 2,022 unique subject terms contained in these 4,378 LIS articles. The most cited subject was searching, and followed by information work. From the top 20 cited subjects in *JOD* papers, as shown in Table VI, one can induce that *JOD* papers tend to deal with issues related to internet development, information retrieval, information seeking behavior, citation analysis, and library, etc. The UK subject perhaps means that articles about UK organizations, such as Thelwall's article in 2002, "The top 100 linked pages on UK university web sites: high backlink counts are not usually directly associated with quality scholarly content."

3.5 Analysis of cited books

There are 2,713 titles of book cited for 3,819 times by *JOD* for the 11 selected years under study as shown in Table VII. Averagely every title was cited 1.4 times. All these book references can be divided into 18 main classes, 115 subclasses and 2,439 subjects.

3.6 Main classes and subclasses of cited books

Based on the Library of Congress Classification (LCC), all books that were cited by *JOD* were grouped into 18 main classes as shown in Appendix 2 (Table AII). Table VIII

Table III.
Document types of cited
literature for *JOD* in 11
selected years

Document type	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total	%
Journal	427	398	559	533	566	550	551	548	502	881	1005	6520	46.0
Book	196	212	339	397	318	288	307	538	311	430	456	3792	26.8
Conference	102	57	84	154	90	95	83	117	133	137	153	1205	8.5
Dissertation	2	4	8	13	9	12	14	17	7	28	16	130	0.9
E-resources	63	215	145	260	158	189	77	113	215	223	199	1857	13.1
Other	52	93	62	54	59	48	65	84	47	40	66	670	4.7
Total	842	979	1,197	1,411	1,200	1,182	1,097	1,417	1,215	1,739	1,895	14,174	100.0

Rank	Main class	%	
1	Library Science. Information Resources (General)	64.1	
2	Science	11.7	
3	Social sciences (General)	7.1	
4	Medicine	3.8	
5	Technology	3.5	
6	Education	2.6	
7	Philosophy. Psychology. Religion	2.3	
8	Language and Literature	2.3	
9	Law	0.8	
10	General works	0.4	
	% of 11th-19th main classes	1.4	Main classes of journals
	Total %	100.0	cited in <i>JOD</i> papers

Table IV.

Main classes of journals
cited in *JOD* papers

Rank	Subclass	%	
1	Science (General)	6.8	
2	Mathematics. Computer science	3.7	
3	Industries. Land use. Labor	2.0	
4	Commerce	1.8	
5	Medicine (General)	1.8	
6	Psychology	1.8	
7	Theory and practice of education	1.7	
8	Philology and linguistics (General)	1.5	
9	Electrical engineering. Electronics. Nuclear engineering. Computer hardware	1.3	
10	Sociology (General)	1.2	
	% of top ten non-LIS subclasses	23.6	
	% of other subclasses ^a	76.4	
	Total %	100	
	Kinds of subclasses	92	

Table V.

Top ten subclasses of
non-LIS journals cited in
JOD papers

Note: ^aIncluding LIS subclasses (64 percent)

shows that library and information science (30.0 percent) is the most cited class, and followed by social sciences (16.3 percent), science (12.5 percent), philosophy, psychology and religion (10.9 percent), and language and literature (10.7 percent).

Table IX demonstrates the top ten subclasses of books cited in *JOD* papers. Among the 115 kinds of subclasses (see Appendix 2 (Table AII)) of books cited in *JOD* papers, the most cited one is "Books (General). Writing. Paleography. Book industries and trade. Libraries. Bibliography" (26.2 percent), and followed by Philology and linguistics (General) (7.7 percent), and other subclasses about linguistics, communication, natural language process, etc, such as *Foundations of Statistical Language Processing* by Manning and Schutze, and Borgman's *Scholarly Communication and Bibliometrics*. It shows that *JOD* paid more attention to issues on library and information science, and also linguistics, psychology, sociology, philosophy, etc.

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Rank	Subject	%
1	Searching	3.3
2	Information work	3.1
3	Online information retrieval	2.9
4	World wide web	2.3
5	Information-seeking behavior	1.9
6	Information storage and retrieval	1.6
7	Subject indexing	1.5
8	Research	1.5
9	Periodicals	1.5
10	Technical services	1.5
11	Citation analysis	1.4
12	Library materials	1.4
13	Internet	1.2
14	Evaluation	1.1
15	UK	1.1
16	Information science	1.1
17	User surveys	1.0
18	Bibliometrics	1.0
19	Libraries	0.9
20	University libraries	0.9
	% of top 20 subjects	32.1
	% of other subjects	67.9
	Total %	100
	Kinds of subjects	2,022

Table VI.
Top 20 subjects of *JOD*'s
cited journal papers on
LIS discipline

Year	Paper	Title
1998	196	169
1999	215	203
2000	339	262
2001	402	331
2002	320	292
2003	294	252
2004	308	282
2005	539	469
2006	313	285
2007	436	378
2008	457	404
Total paper	3,819	
Total title		2,713

Table VII.
Numbers of cited book
titles in *JOD* papers in 11
selected years

3.7 Subjects of cited books

Through retrieving from the WorldCat, 2,713 books cited by *JOD* contained 2,439 unique subject headings. Subjects cited once accounted for 17.7 percent (1,419 kinds), and subjects ranking after 20 and cited twice accounted for 67.6 percent (1,000 kinds, and 5,413 cited times). Table X displays top 20 subjects of *JOD*'s cited books. Most of them were about information science, library science, social aspects, etc. Besides, the distribution of subjects is similar to that of main classes of *JOD*'s cited journals.

Rank	Main class	%
1	Library Science. Information Resources (General)	30.0
2	Social sciences (General)	16.3
3	Science	12.5
4	Philosophy. Psychology. Religion	10.9
5	Language and Literature	10.7
6	Education	5.0
7	Technology	4.0
8	History (General) and History of Europe	2.1
9	Geography. Anthropology. Recreation	1.4
10	Medicine	1.3
% of 11th-18th main classes		5.91
Total %		100

Table VIII.
Main classes of books
cited in *JOD* papers

Rank	Subclass	%
1	Books (General). Writing. Paleography. Book industries and trade. Libraries. Bibliography	26.2
2	Philology and linguistics (General)	7.7
3	Science (General)	5.7
4	Mathematics. Computer science	5.4
5	Psychology	5.2
6	Sociology (General)	4.6
7	Information Resources (General)	3.9
8	Industries. Land use. Labor	3.5
9	Theory and practice of education	3.4
10	Philosophy (General)	3.4
% of top 10 subclasses		68.8
% of other subclasses		31.2
Total %		100
Kinds of subclasses		115

Table IX.
Top ten subclasses of
books cited in *JOD* papers

The main classes that *JOD* tended to discuss were issues related to information science, social sciences, science, etc, and subjects of books highly cited in *JOD* were about information retrieval system, information science, library science, indexing, social sciences research, and different kinds of libraries.

4. Summary and conclusions

The present study conducts a bibliometric analysis of *JOD* publications for volumes published in 11 selected years. The study reveals the following findings:

- Journal articles are the most cited document, and followed by books and book chapters, electronic resources, and conference proceedings, respectively.
- The three main classes of cited journals in *JOD* papers are library science (64.1 percent), science (11.7 percent) and social sciences (7.1 percent). The three subclasses of non-LIS journals that were highly cited in *JOD* papers are Science (6.8 percent), "Mathematics. Computer science" (3.7 percent), and "Industries. Land use. Labor" (2 percent).

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Rank	Subject	%
1	Information storage and retrieval systems	1.8
2	Information science	1.4
3	Information retrieval	1.2
4	Library science	0.9
5	Indexing	0.8
6	Libraries	0.8
7	Information behavior	0.8
8	Digital libraries	0.6
9	Science-philosophy	0.6
10	Public libraries	0.6
11	Discourse analysis	0.6
12	Communication in science	0.6
13	Social sciences-research	0.6
14	Knowledge, theory of	0.5
15	Human-computer interaction	0.5
16	Qualitative research	0.5
17	Information technology-social aspects	0.5
18	Science-social aspects	0.5
19	Research	0.5
20	Subject cataloging	0.5
	% of top 20 subjects	14.7
	% of other subjects	85.3
	Total %	100
	Kinds of subjects	2,439

Table X.
Top 20 subjects of books
cited in *JOD* papers

- The three highly cited subjects of library and information science journals encompass searching, information work, and online information retrieval.
- The most cited main classes of books in *JOD* papers is library and information science, and followed by social sciences, science, "Philosophy. Psychology. Religion." The three highly cited subclasses of books in *JOD* papers are "Books (General). Writing. Paleography. Book industries and trade. Libraries. Bibliography," "Philology and linguistics," and Science, and the most cited subject of books is information storage and retrieval systems.

Results of the present research found that information science, as represented by *JOD*, is a developing interdisciplinary subject with an expanding literature. Increasingly, there has been great growth in the citing of previous literature in library and information science, social sciences, nature science, industries/land use/labor, mathematics/computer science, philosophy, psychology, and linguistics demonstrating the interdisciplinary nature of information science. This findings support the assumption that *JOD* accurately represents the information science discipline on the basis of Borko's (Borko, 1968) and Saracivic's (1999) definitions.

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Main class	Subclass	Cited times	
<i>General works</i>	Academies and learned societies	6	
	History of scholarship and learning.		
<i>Philosophy. Psychology. Religion</i>	The humanities	1	
	Periodicals	17	
	Christian denominations	2	
	Ethics. Social usages. Etiquette	3	
	Logic	1	
	Philosophy (General)	21	
	Psychology	122	
	Religions. Mythology. Rationalism	2	
	Speculative philosophy	9	
	Diplomatics. Archives. Seals	20	
<i>Auxiliary Sciences of History</i>	History of civilization	3	
<i>History (General) and History of Europe</i>	Africa	2	
	Asia	1	
	Europe	1	
	History (General)	8	
	Russia. Soviet Union. Former Soviet Republics – Poland	1	
		1	
		1	
<i>History: America</i>		12	
	<i>Geography. Anthropology. Recreation</i>	1	
	Anthropology	1	
	Environmental Sciences	2	
	Geography (General). Atlas. Maps	2	
	Physical geography	3	
	Recreation. Leisure. Sports	2	
	<i>Social sciences (General)</i>	Commerce	124
		Communities. Classes. Races	5
		Economic history and conditions	13
Economic theory. Demography		27	
Finance		5	
Industries. Land use. Labor		137	
Public finance		1	
Social history and conditions. Social problems. Social reform		4	
Social pathology. Social and public welfare.			
Criminology		10	
Social sciences (General)		64	
Sociology (General)		81	
Statistics		4	
The family. Marriage. Woman		10	
Transportation and communications		3	
<i>Political Science</i>		General legislative and executive papers	1
		Political institutions and public administration – Europe	1
	Political institutions and public administration – United States	5	
	Political science (General)	7	
	Law in General. Comparative and uniform law. Jurisprudence	55	
	Law of the United States	2	
<i>Law</i>	Law of Europe	1	
	College and school magazines and papers	10	
	Education (General)	29	

Table AI.
Main class and subclass
of cited journals on the
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(continued)

Main class	Subclass	Cited times
	History of education	6
	Special aspects of education	18
	Theory and practice of education	113
<i>Music</i>	Literature on music	5
<i>Fine arts</i>	Architecture	1
	Arts in general	1
	Visual arts	7
<i>Language and Literature</i>	English language	11
	English literature	1
	Greek language and literature. Latin language and literature	1
	Literature (General)	33
	Modern languages. Celtic languages	4
	Philology and linguistics (General)	103
	Romanic languages	2
<i>Science</i>	Astronomy	6
	Botany	1
	Chemistry	22
	Mathematics. Computer science	251
	Microbiology	1
	Natural history-Biology	35
	Physics	6
	Physiology	8
	Science (General)	466
	Zoology	1
<i>Medicine</i>	Dermatology	2
	Gynaecology and obstetrics	3
	Internal medicine. Practice of medicine	35
	Medicine (General)	123
	Nursing	52
	Otorhinolaryngology	1
	Pathology	5
	Pediatrics	1
	Public aspects of medicine	29
	Surgery	9
<i>Agriculture</i>	Agriculture (General)	1
<i>Technology</i>	Building construction	1
	Chemical technology	2
	Electrical engineering. Electronics. Nuclear engineering. Computer hardware	92
	Engineering (General). Civil engineering (General)	49
	Environmental technology. Sanitary engineering	6
	Home economics	4
	Manufactures	6
	Mechanical engineering and machinery	1
	Technology (General)	75
<i>Military Science</i>	Military administration	1
	Military science	11
<i>Library Science. Information Resources (General)</i>	Books (General). Writing. Palaeography. Book industries and trade. Libraries. Bibliography	4,187
	Information resources (General)	196
Total		6,835

Table AI.

Main class	Subclass	Cited times		
<i>General Works</i>	History of scholarship and learning.	13		
	The humanities	9		
	Encyclopaedias (General)	3		
	<i>Philosophy. Psychology. Religion</i>	Dictionaries and other general reference works	2	
		Museums. Collectors and collecting	1	
		Academies and learned societies	176	
		Psychology	114	
		Philosophy (General)	66	
		Speculative philosophy	6	
		Ethics. Social usages. Etiquette	3	
		Logic	2	
		Religions. Mythology. Rationalism	1	
		Christianity	1	
	<i>Auxiliary Sciences of History</i>	Aesthetics	7	
		History of civilization	5	
		Diplomatics. Archives. Seals	2	
		Biography	1	
		Technical chronology. Calendar	1	
		Archaeology (General)	1	
	<i>History (General) and History of Europe</i>	Africa	27	
		History (General)	18	
		Europe	10	
		Asia	6	
		France – Andorra – Monaco	5	
		Oceania (South Seas)	2	
		Greco-Roman World	2	
	<i>History: America</i>		11	
		<i>Geography. Anthropology. Recreation</i>	Anthropology	29
			Geography (General). Atlas. Maps	6
			Manners and customs (General)	4
			Recreation. Leisure. Sports	2
			Human ecology. Anthropogeography	2
			Mathematical geography. Cartography	2
<i>Social sciences (General)</i>			Environmental Sciences	1
			Sociology (General)	156
			Industries. Land use. Labor	118
	Social sciences (General)		77	
	Commerce	40		
	Economic history and conditions	36		
	Statistics	28		
	The family. Marriage. Woman	23		
	Social history and conditions. Social problems. Social reform	18		
	Transportation and communications	13		
	Economic theory. Demography	13		
	Social pathology. Social and public welfare.			
	Criminology	12		
	Communities. Classes. Races	10		
	Socialism. Communism. Anarchism	6		

Table AII.
Main class and subclass
cited by books on the JOD

(continued)

Main class	Subclass	Cited times
	Finance	3
	Public finance	1
<i>Political science</i>	Political institutions and public administration – Europe	8
	Political theory	6
	Political institutions and public administration – General	3
	Political science (General)	2
	Political institutions and public administration – United States	2
	Local government. Municipal government	1
	General legislative and executive papers	1
	Law in General. Comparative and uniform law. Jurisprudence	24
<i>Law</i>	Law of the United Kingdom and Ireland	12
	Law of Europe	4
	Law of the United States	3
<i>Education</i>	Theory and practice of education	117
	Special aspects of education	44
	College and school magazines and papers	5
	History of education	4
	Education (General)	1
<i>Music</i>	Literature on music	19
	Musical instruction and study	1
<i>Fine arts</i>	Visual arts	13
	Architecture	5
	Arts in general	5
	Decorative arts	4
	Painting	4
	Drawing. Design. Illustration	2
<i>Language and Literature</i>	Philology and linguistics (General)	262
	Literature (General)	40
	English language	27
	English literature	9
	Languages and literatures of Eastern Asia, Africa, Oceania	6
	Uralic languages. Basque language	5
	Germanic literatures	3
	Greek language and literature. Latin language and literature	2
	Romanic languages	2
	American literature	2
	West Germanic languages	1
	French literature – Italian literature – Spanish literature – Portuguese literature	1
	Slavic languages. Baltic languages. Albanian language	1
	Indo-Iranian languages and literatures	1
<i>Science</i>	Science (General)	193
	Mathematics. Computer science	183
	Natural history-Biology	24
	Astronomy	8

(continued)

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67,5

822

Main class	Subclass	Cited times
	Chemistry	5
	Physiology	5
	Physics	5
	(unavailable)	1
	Geology	1
<i>Medicine</i>	Public aspects of medicine	13
	Medicine (General)	13
	Internal medicine. Practice of medicine	7
	Gynaecology and obstetrics	5
	Nursing	4
	Pathology	1
	Pediatrics	1
<i>Technology</i>	Electrical engineering. Electronics. Nuclear engineering. Computer hardware	59
	Technology (General)	46
	Engineering (General). Civil engineering (General)	14
	Manufactures	7
	Handicrafts. Arts and crafts	3
	Environmental technology. Sanitary engineering	2
	Hydraulic engineering	1
	Home economics	1
	Mechanical engineering and machinery	1
	Mining engineering. Metallurgy	1
	Railroad engineering and operation	1
<i>Military Science</i>	Military science	24
	Military administration	3
<i>Library Science. Information Resources (General)</i>	Books (General). Writing. Palaeography. Book industries and trade. Libraries.	
	Bibliography	890

Table AII.

(continued)

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