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MAPPING THE KEY WORDS USING BIBLIOGRAPHIC DATA BASE: A STUDY

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ABSTRACT

Mapping is used to make survey, to plan or to trace the outline or to depict in words of gestures, to portray the disciplines. This technique is useful to illustrate the past and present developmental history of any field, and helpful in modeling the knowledge development. This paper deals with the mapping of text key words in the selected subject area using the database 'Scopus' and it is useful for the researchers to get more relevant information in their area of study

Key Words: Mapping, Physics, Astronomy, Scopus, Sound Waves

1. INTRODUCTION:

A mapping is to represent all adjacent or territories of knowledge in a helpful order showing the logical subordination and coordination of classes. It is a technique first used by J D Bernal and refined by Eugene Garfield. The desirable quality of mapping should be able to accommodated additional information, when new territories of knowledge are explored in the universe of knowledge or annexed to the new territory of knowledge with the already existing universe of knowledge

Mapping is used to explore or make a survey, to plan or delineate especially in detail to locate, to draw or trace the outline; to sketch out, to represent pictorially or to depict in words of gestures, to portray the disciplines. This technique is useful to illustrate the past and present developmental history of any field, and helpful in modeling the knowledge development.

The study of structure and pattern of development of the universe of knowledge at different stages in its growth will help to recognize a variety of modes of formation of subjects. The modes of formation of subjects have their applications on the design of a documents retrieval

system. The study of characteristics of the subject and its growth is therefore essential for the efficient design of systematic document retrieval

2. REVIW OF LITERATURE

The growth and development of subjects may be assessed by analyzing literature growth in that field. Scholars have used different techniques & methods such as counting of publications, bibliometric analysis, scientometric analysis, author productivity, citation analysis and such other techniques to map the growth of the universe of subjects. With the help of such a study not only scholars tried to find the status of countries research output in a given discipline but also forecasted the frontier areas of research. The studies also established structure of subject growth through mapping of the subject field. These findings are found to be helpful in knowledge organization, information retrieval and also drafting national policy for research and development.

Leydesdorff developed in the 60's the dynamic mapping of science using the data in the Science Citation Index. Aparna Basu and P.S Nagpaul attempt to provide detailed analysis of multidiscipline among 10,103 and 11,314 articles, Indian contributions covered by Science Citation Index database of 1990 and 1994 respectively. Of these contributions 1,013 & 1,382 respectively were published in Indian Journals and the rest published in journals from US and other countries

The Internet has altered forever our expectations for discovering, accessing and using information. In the past, when library collections comprised print, audio, audio-visual, etc., materials physically housed in the library building, bibliographic data helped satisfy a user's information need by making the right information in the right format discoverable. Today, information resources include licensed electronic resources, such as e-books, e-journals, and e-audio, as well as digital archives and the vast array of information and reference resources available via the Internet.

Research indicates that Google's attraction is attributed to several factors that all relate to ease of use, including the following factors that relate to the underlying data (Markey, 2007):

- It takes little prior topical knowledge to get started, i.e., searches do not need to be highly targeted;
- The ability for users to make relevancy decisions from brief displays; and
- Links take users directly to electronic full-text, if available.

3. NEED:

Due to the information explosion, researchers are finding difficult to get their required information in their research area and also, more and more information on the research are available on interdisciplinary subjects. So, it is necessary to map the information to get the required information

4. OBJECTIVES:

- To identify and understand the output of research papers in the selected subject, so as to know the research papers that have relation;
- To assist the experts in the area to estimate the extent of relevance between one and another concept in terms of research papers;
- To study the structure of relation and links between research papers that deal with selected area; and
- To map the research literature on the selected area and other related areas by drawing the output.

5. METHODOLOGY:

The methodology used to collect the data is case study method. The data has been collected from bibliographic data base 'SCOPUS'. A specific time frame (1998-2008) is selected and the bibliographic records are downloaded to analyse the relations among the subjects. To study the mapping among the peer reviewed journals it has been chosen 'Physics and Astronomy' as main subject and 'sound waves' as a research term.

SCOPUS, is a citation database of abstracts and citations for scholarly journal articles. It covers nearly 18,000 titles from more than 5,000 international publishers, including coverage of 16,500 peer-reviewed journals in the scientific, technical, medical and social sciences (including arts and humanities) fields. It is owned by Elsevier and is provided on the Web for subscribers. It also offers author profiles which cover affiliations, number of publications and their bibliographic data, references and details on the number of citations each published document has received.

6. ANALYSIS OF DATA:

To study the key words mapping, the data has been collected from database **'SCOPUS'** in the subject area "Physics & Astronomy" and the research term as "sound waves". The period selected for the study is from 1998-2008

6.1 Documents available in different source types

The following table-1 shows that the number of documents published in different languages, sources, and document types in the selected period 1998-2008

Table-1

Source Type	Language	Document Type
Journals (34,751) Conference Proceedings (6,369) Book Series (603) Trade Publications (378) Books (32) Reports (6)	English (40,081) Chinese (1,283) Japanese (312) Russian (162) German (148) French (94) Spanish (25)	Articles (32,717) Conference Paper (7,883) Review (1,245) Letter (97) Short Survey (64) Note (56) Conference Review (46)

6.2. Details of the documents available in the selected subject area

It has been chosen **"Physics and Astronomy"** as Subject area of the research and the selected research term '**Sound Waves**'. There are 11,075 documents available for the selected period.

Table-2

Source Title	Author	Year	Subject Area
Journal of the Acoustic Society of America (3,485) Acoustical Physics (605) Physical Review B Condensed Matter and Materials Physics (568)	Lauriks,W (45) Fink, M. (44) Shukla, P.K. (37) Kuperman, W.A. (31) Wilson, D.K. (28) Ruocco, G. (28) Pan, J. (28)	2008 1,313) 2007 (1,237) 2006 (1,234) 2005 (1,200) 2004 (1,049) 2003 (1,055) 2002 (852)	Physics and Astronomy (11,075)

6.3 Documents available in different source types

The following table shows that the documents available in the selected period in different source types viz, Journals, Conference Proceedings, Book Series and Trade Publications etc. It can be observed that, the highest number of documents available only in Journals.

In languages, English language has the highest number of documents published with 10,629 numbers than the rest of the languages. As for as the document type is concerned, 'Articles' are more in numbers than others

Table-3

Source Type	Language	Document Type
Journals (10,573) Conference Proceedings (446) Book Series (31) Trade Publications (25)	English (10,629) Chinese (317) Russian (90) French (15) German (9)	Articles (9,746) Conference Paper (1,024) Review (272) Letter (12)

6.4 Country wise journal documents published

In the below table, countries with highest number of documents published are selected out of 180 countries. **United States** has published highest number of documents 3, 13,549 in the subject area **Physics and Astronomy** for the period **1996-2008** with highest citation number 48, 11,074 and 15.79 citations per document. Other countries like, Japan, Germany, China, Russia, France, UK, Italy are placed in the next position subsequently. India, is in the 9th place with 41,476 documents with 2, 89,169 citations and 7.94 citations per document

Table-4

Sl.No	Country	Documents	Citations	Citations per Document
1	United States	313,549	4,811,074	15.79
2	Japan	161,840	1,533,396	9.87
3	Germany	150,206	1,953,245	13.73
4	China	133,567	668,367	6.67
5	Russian Federation	104,411	699,352	6.86
6	France	101,457	1,199,924	12.67
7	United Kingdom	94,078	1,190,266	13.58
8	Italy	68,063	742,049	11.86
9	**India**	**41,476**	**289,169**	**7.94**
10	Canada	40,888	479,054	12.89

6.5 List of journal with highest no. of articles published

Selected the **highest number of articles** (3,274) in the selected topic is available in the journal **"Journal of the Acoustic Society of America"** published by the Acoustical Society of America

Table-5

Source Title	Author	Year	Affiliation
Journal of the Acoustical Society of America (3,274)	Fink,M (31) Marston, P.L. (26) Kuperman, W.A. (25) Lauriks, W. (24)	2008(299) 2007 (336) 2006 (350) 2005 (335) 2004 (308)	Naval Research laboratory (115) Scripps Institution Oceanography (93) Woods Hole Oceanographic Institution (85)

6.6 Highest number of articles published by the author

Selected the author "Fink,M" with highest number of articles (31) in his credit in the period from 1998- 2008 along with the other co-authors

Table-6

Source Title	Author	Year
Journal of the Acoustical Society of America (31)	Fink, M (31) Tanter, M. (8) Prada, C. (7) Aubry, J.F. (5)	2008 (1) 2007 (4) 2006 (4) 2005 (3)

6.7 Article published by the author with highest number of citation

Out of 31 articles published by the author "Fink,M", the following title has the highest number **(90)** of citation in the year 1999 in selected journal "Journal of the Acoustic Society of America"

Table-7

A solution to diffraction biases in sonoelasticity: The acoustic impulse technique	**Catheline, S., Wu, F., Fink, M.**	**1999**	***Journal of the Acoustical Society of America* 105 (5), pp. 2941-2950**	**90**

6.8 Cited documents list for the selected article

90 documents that have cited for the title appeared in the year 1999 with different subject areas like Physics, Engineering, Medicine, Chemistry, Computer Science etc

Table-8

Source Title	Author	Year	Subject Area
Journal of the Acoustical Society of America (14) IEEE Transactions on Ultrasonics Ferroelectrics and Frequency Control (12)	Cathelin,S (14) Fink, M. (12) Sandrin, L. (10) Parker, K.J. (9)	2008 (10) 2007 (7) 2006 (10) 2005 (14)	Physics and Astronomy (49) Engineering (42) Medicine (33)

6.9 Documents with highest citation

The following table shows that, highest cited document as taken out of 38 documents cited for the subject 'Physics & Astronomy' for the above selected title

Table-9

Source Title	Author	Year	Source Type	Cited by
Shear Module imaging with 2-D transient elastography	Sandrin, L., Tanter, M., Catheline, S., Fink, M.	2002	*IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control* 49 (4), pp. 426-435	**94**

6.10 Relation between the 2 journal documents with mapping the Indexed terms in the content

It is observed from the following table, that the articles published in the journal "*Journal of the Acoustical Society of America* 105 (5), pp. 2941-2950" in the year 1999 has similarities in content key words in the journal article "IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control **,**Volume 49, Issue 4, Pages 426-435 published in the year 2002,

Table-10

Source Type	Source Title	Author	Year	Indexed Term
Journal of the Acoustical Society of America 105 (5), pp. 2941-2950	A solution to diffraction biases in sonoelasticity: The acoustic impulse technique	Catheline, S., Wu, F., Fink, M.	**1999**	Acoustics; Elasticity; Humans; Models, Biological; Ultrasonics; Vibration; Viscosity
IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control Volume 49, Issue 4, April 2002, Pages **426-435**	Shear modulus imaging with 2-D transient elastography	Sandrin, L., Tanter, M., Catheline, S., Fink, M.	**2002**	Elasticity; Humans; Phantoms, Imaging; Transducers; Ultrasonography; Vibration

7. CONCLUSIONS:

By mapping the key words of the selected subject area the researchers will get more relevant information in their area of study. Today, researchers are used to perform queries on these databases with keywords or combination of keywords in order to find articles associated to a precise scientific field.

Based on how scientists conduct research and read the literature, the content mapping bring together three innovations in analyzing, displaying and summarizing research reports across a domain

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