IndMED: Indian biomedical research database developed at NIC

- a case study.

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Abstract

IndMED is an online bibliographic database covering 75 Indian Biomedical Journals. It was conceived to fill up the gaps of reporting medical research from India by incorporating those peer reviewed journals which were not indexed by major abstracting and indexing services such as MEDLINE. These journals were selected based on certain criteria fixed by Journal Selection Committee. A database structure was framed using Common Communication format and adopted International standards for laying out data in the database. Suitable back-end and front end were developed to publish it on the web. It is available from Internet free of cost. Along with the bibliographic details of the articles it also provides links to the available source journals on the web.

Introduction

Adequate publicity and dissemination of Indian biomedical research has been a matter of concern for Indian medical professionals for many years, particularly in the context of numerous bibliographic database, compiled and disseminated worldwide, both online and through CDROM. Indian contribution in the areas of biomedical research and health care has been significant and conforming to international standards. However, only a small fraction of it is covered cited. There could be many factors responsible for this poor representation biomedical research published in India.

One of the factors could be that third world countries, including India, are facing the predicament of neglect of biomedical research, irrespective of its value to mankind. The issue has been distinctly addressed in the 1st November 1997 issue of "New Scientist" under the editorial page [4] and one of the articles entitled "The price of prejudice" [2].

Other important factor of poor citation of Indian Biomedical Journals could be Internet "Invasion" which made more and more researchers and practitioners choose World Wide Web as their primary tool of information search. Thus, those publication which are not available "Online" runs the risk of becoming "Invisible" [5]. To get noticed, the journals need not only be covered in indexing services but be made available on the Internet. However very few Indian biomedical journals qualify these requirements.

MEDLINE is the most sought bibliographic database in the area of biomedical research and practice. However, the coverage of Indian journals is very limited. ICMR-NIC Centre has developed a bibliographic database by indexing Indian biomedical journals. As these journals are not covered in MEDLINE database, it supplements MEDLINE for the coverage of biomedical literature published from India. It provides the much-required exposure to Indian biomedical research and caters to the requirements of information seekers.

IndMED

IndMED is produced by Indian Medlars Centre (IMC) (http://indmed.nic.in). In 1986, National Informatics Centre (NIC) and Indian Council of Medical Research (ICMR) (http://www.icmr.nic.in) jointly set up a centre called *ICMR-NIC Centre for Biomedical Information.* The primary goal of the Centre was to meet the information needs of the medical professionals in India from the MEDLARS (Medical Literature Analysis and Retrieval Systems) databases of United States National Library of Medicine (NLM), USA (http://www.nlm.nih.gov) and other databases. In 1990, the Centre came to be recognized as the 17th International MEDLARS Centre (IMC) and is known as Indian Medlars Centre (http://indmed.nic.in). The Centre provides information from various databases and biomedical resources to the users in the country. In recent past, the centre has been more focussed towards the content generation and distribution.

IndMED is a bibliographic database. "**Bibliographic databases** are text databases that contain references to journal articles and sometimes chapters in books and conference proceedings. References are usually supported by abstracts or summaries of the contents of the article to help you gain a clear idea of the information that each article contains." [1]. A bibliographic record usually have information like Author(s), Address of the Author(s), Title of the Article, Name of the Journal, Volume of the Journal, Issue of the Journal, Pagination of the article, Abstract of the article and Keywords representing the theme of the article. A bibliographic database is characterized by having variable number of fields and variable record length.

IndMED is available free-of-charge to the individuals through Internet at http://indmed.nic.in. Its Web interface provides three levels of searching and three levels of display of the search results. The display of references also provides hypertext links in case source journal is available on the Internet.

Development of IndMED Database

IMC had been making efforts to build bibliographic databases from biomedical journals published in India. An initial effort to this was the database on Neurology, developed by IMC in 1989. In 1993 a database on Population was compiled by IMC. Tuberculosis Research Centre (TRC), Chennai was given a project to index articles from journals pertaining to "Tuberculosis & Allied Chest Diseases" in 1995. Another project was given to Kidwai Memorial Institute of Oncology (KMIO), Bangalore to index articles from journals related to "Oncology". A common database structure based on the "Common Communication Format, 2nd Edition [3] was used for all these databases. CDS/ISIS Version 3.07 [7] was used as the DBMS. Later it was decided to include more journals from other subject areas as well and club all these databases into one

national database called IndMED. It has been named as IndMED to reflect its scope of covering Indian biomedical literature.

Selection of Journals

IndMED was designed and developed on the lines of MEDLINE database. It indexes Indian biomedical journals and covers 75 journals from the year 1986 onwards. The Aim of IndMED database is provide exposure to articles published in learned biomedical journals from India. A "IndMED Journals Selection Committee" (IJSC) does the selection of journals for indexing in IndMED. Presently, the IJSC has laid down the following criteria for selection of journals:

- Journal should be Peer-reviewed.
- Journal should be published on time.
- Journal should be published atleast twice in a year.
- Journal should have started atleast three years prior to selection.
- Preference is to be given to Non-MEDLINE journals to avoid duplication of efforts.

Indexing Process

The timely receipts of journals are tracked and reminders to the publishers are sent at regular intervals if required. On the receipt, the journals are assigned to indexers for indexing. The indexing work involves: -

- Reading and understanding of the articles by indexers;
- Finding key concepts discussed;
- Standardizing these concepts into keywords according to MeSH [8];
- Rendering of bibliographic details in indexing sheets along with standardised keywords.
- Indicating of presence of author written abstract if any.

Once the indexing is completed data entry is done. Data from indexing sheets is entered in flat text files in tagged manner. These text files are then subjected to spell checking process using standard word processing software. After the spell check the files are converted into ISO2709 format. The data is then imported in temporary ISIS database for further processing. This database is then edited and standard journals' IDs are added to facilitate "relational linking". Once the data in the database is found is order, it is exported in ISO 2709 format. This data is then merged in the IndMED database on the database server and made available for the public access. This addition of data to IndMED database is an ongoing and continuous process.

WEB Interface to IndMED

IndMED was made publicly accessible in December1997 through WEB (World Wide Web) using BASIS+ Webserver. The data was converted from CDS/ISIS into BASIS+ by using writing special utility for this purpose. The WEB interface was later on improved and redesigned. It made use of i) Three levels of search interfaces as front end; ii) ISIS database file structure as the backend and iii) Web-Database Connectivity using CGI and implemented by PERL scripts [6].

Searching IndMED through WEB Interface is relatively easy. Search terms can be entered in one of the three query forms i.e. Simple Form, Minimal Box or Advance Search Form depending upon the complexity of the query. Minimal Box is available at the top of most of the pages of the site. The Simple Form and Advance Form are available at IndMED Page. Right truncation of the search terms is also available by using an dollar ($) sign. Single words can be combined with Boolean Operators (AND, OR, and NOT) to form a complex query. For some fields "Phrase searching" is also available. Further by using Advanced Search Form, searches can be restricted to particular fields like Authors, Journals, Article Title, Keywords and ISSN etc.

Search results are displayed by generating dynamic HTML pages. The display has a top "manipulating tool bar"; middle portion displaying references retrieved in response to the query and a bottom reusable search box showing the query. All or selected references can be redisplayed by using different display format. "**Citation**" format displays the Author(s), Address, Title and Source. **Citation+Abstract** format displays Abstract along with the Citation. **Full Record** format displays Keywords, Other Keywords and No. of References in addition to elements displayed by Citation+Abstract Format. In all the formats, the journals available on Internet are shown as hypertext links.

Conclusion

IndMED provides much needed exposure to biomedical research published in India and acts an important resource to biomedical information seekers. It is being updated on an ongoing and timely basis. It has received tremendous response from the biomedical community bot at national as well as international level. It has been listed at several resource directories as a useful resource for biomedical research and practice. Links to Full text articles would be made available through NIC servers by developing full text archives of indexed journals.

References

1) BOURNEMOUTH UNIVERSITY. *Bibliographic Databases*, [Online], Available: http://www.bournemouth.ac.uk/library_catalogue/html/biblio.html [2001, Oct. 12]

2) DAY (M). The price of prejudice: the world may miss out because the fruits of research in developing countries seldom make it to the pages of top journals. New Scientist. 156(2106); 1997; 22-23

3) HOPKINSON (A) and SIMMONS (P) (Ed). CCF, the Common Communication Format. 2nd Ed. Paris: UNESCO, 1988

4) It's not what you know - If there are biases in scientific publication editors must take the blame. New Scientist. 156(2106);1997; 3

5) LAWRENCE (Steve). Online or invisible. Nature. 411(6837); 2001; 521

6) SINGH (Sukhdev). Web Enabling a Bibliographic Database of Indian Biomedical Journals: IndMED. MS Dissertation. Pilani: Birla Institute of Technology and Science, 2001.

7) UNESCO. The UNESCO micro CDS/ISIS Software. [Online], 2002. Available: http://www.unesco.org/webworld/isis/ [2002, Oct. 15].

8) UNITED STATES NATIONAL LIBRARY OF MEDICINE. Medical Subject Headings. 2002. , [Online],
Available: http://www.nlm.nih.gov/mesh/meshhome.html [2002, Oct. 16].