Bibliographic databases in the field of Bio Medical Sciences: A review

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Abstract: We are living in the world of information explosion especially in the influence of information communication technology has brought drastically changes in the field of information. Bio medical information is playing major role in the dissemination and accessing literature in the current trends of information passed through wired or without boundaries flowing in the channels. Information centre access information through available literature among bibliographies, databases and other online data base. This paper highlights the important online databases of biomedical literature today which will be useful for research scholars and scientists in medical field in the present scenario.

Keywords: Biomedical, Bibliographies, databases, pubmed, Embase, Cochrane.

I. INTRODUCTION

The past five decades have witnessed the so-called data deluge and publication explosion across all branches of science. (Gasparyan AY.2013).Numerous academic journals have been launched that use a systematic approach to the submission, peer review, and publishing of information. To facilitate the wide use of published sources, libraries across the world have expanded cataloguing and advanced literature search techniques. The first major step towards indexing academic journals and helping libraries acquire the most influential sources was made by the Institute for Scientific Information (ISI) in Philadelphia, USA, in 1960. The idea behind indexing and distributing information on published articles was to facilitate scientific communication between authors and readers Garfield E. (2012). In other words, indexing was proposed as a tool for finding relevant sources of interest to the consumers. The originator of the idea, Eugene Garfield, also the founder of the ISI, formulated several critical points in biblio metrics that have shaped citation indexes, for example, libraries with limited funding should be selective about the journals they acquire; most read and highly cited journals constitute 'quality' sources; highly cited articles influence science; citations from highly-cited journals are weighed more than those from low-cited ones; and a bibliography should selectively cover 'high quality' sources.

II. DEFINITION

Bibliographic databases are broadly defined as digital collections of references to published sources, particularly to journal articles and conference proceedings, which are tagged with specific titles, author names, affiliations, abstracts, and IDs. The PubMed ID (PMID) and Digital Object Identifier (DOI) are frequently used encodings that help locate individual published items. Bibliographic databases may also use a specific set of keywords, or thesaurus, to better organize the indexing and to improve the irretrievability of the indexed items. Prime examples are Medical Subject Headings (MeSH) and EMtree collections of keywords utilised by Medical Literature Analysis and Retrieval System Online (MEDLINE; US National Library of Medicine) and EMBASE (Elsevier), respectively. The databases are also classified as abstracting and citation-tracking. Examples of the former are MEDLINE and EMBASE, and the latter - Scopus and Science Citation Index Expanded. Depending on the scope of coverage, databases are divided into large groups of multidisciplinary, specialized, and narrow-specialized ones. Most prestigious databases cover periodicals of global/international importance, while there are also regional and even country-

based abstracting and/or citation-tracking platforms (for example, KoreaMed and Korean Medical Citation Index). Finally, there are databases requiring subscription and those free to all users. Many leading academic and research institutions worldwide secure paid access to subscription databases. The databases can also be accessed through digital search interfaces such as Ovid and EBSCO, and they can link the indexed items to the full-texts in digital search platforms (for example, Elsevier's Science Direct, Springer's SpringerLink, and Wiley Online Library) and free online libraries (for example, PubMed Central and SpringerOpen).

III. REVIEW OF LITERATURE

Konstantinidis, Georgios et al (2012) studied healthcare analysis and design and the lessons learned from our experience with the development of a distributed, object-oriented Clinical Information System (CIS). In order to overcome known issues regarding development, implementation and finally acceptance of a CIS by the physicians we decided to develop a novel object-oriented methodology by integrating usability principles and techniques in a simplified version of a well established software engineering process (SEP), the Unified Process (UP). A multilayer architecture has been defined and implemented with the use of a vendor application framework.

Qin, Yong,et al, (2011) analyzed the significance of fragmentation and resource allocation technologies as well as system design strategies in development, allocation and management of resources for literature resources-sharing, and pointed out is the shortage of literature resources-sharing systems, thus providing the evidence for perfecting its construction in China..Baro, Emmanuel E, et.al.,(2011) investigated whether undergraduate students in the College of Health Sciences in Niger Delta University are information literate, and to determine whether they are aware of and use different information resources including electronic ones, and to assess their ability to evaluate information before use. Questionnaire and interview methods were used to collect data from the students. The students mostly rely on textbooks, medical journals, the internet, colleagues, and the Nigerian National University Commission's virtual library for information. Sutiono, Agung Budi (2010) explained the means of designing an effective user interface software package varies from one application to another. Almost the entire ICT infrastructure was damaged following the impact of the tsunami tidal wave. Under such circumstances, transporting critically ill patients is a must and becomes the first priority. Many considerations are needed when designing a specific user interface for emergency situations in developing countries. In this study we proposed how to design the user interface in order to support emergency medical care in the early stages of disasters. Zhang, Xiao-mei. (2010) examined the consistency of data version, data operation and database management, etc, runs through the whole research and development process of databases. Human and system factors, including data collection, standard data processing and indexing, error correction and data publication during the research and development of literature databases, may lead to data inconsistency. Certain measures for avoiding such data inconsistency were put

Lahtiranta, Janne(2009)reports health care has come to a turning point. Particularly due to aging societies and economic pressure placed on health care system, health is rapidly becoming one's own responsibility. This fundamental paradigm shift does not only affect the way health care services that will be provided in the near future but it also places enormous health information management demands on the laypeople. The purpose of this paper is to look into this emerging phenomenon, its current challenges and available solutions. In order to identify different kinds of solutions used for personal health information management (PHIM) and related challenges, a bibliographical review is conducted using five online databases. orward in terms of error prevention and correction, operators and processing system. Falzon, Louise; Trudeau, Kimberlee (2007)examined the development of the Cochrane Behavioral Medicine Field database of interventions and its contribution to the knowledge base of this field. A list of behavioural medicine interventions was solicited from content experts. The resulting list of index terms was used to generate a comprehensive search strategy to retrieve relevant records, and a thesaurus of terms with which to index them. The records are included in a register. A subset of records have been coded for study design, health condition, intervention, study participants, setting and provider and made available in a public online database. Results: The Cochrane

Behavioral Medicine Field database consists of over 3500 records of systematic reviews, meta-analyses and randomized controlled trials for public educational use.

IV. BIOMEDICAL DATABASES

- **PubMed/MEDLINE**

Pub Med is a freely accessible search platform of the US NLM at the National Institutes of Health, which was first released in 1996. It employs the Entrez search engine, which interlinks all the databases of the National Centre for Biotechnology Information (NCBI) at the NLM, including PubMed, PubMed Central, and MEDLINE. PubMed is the largest and most well-organised abstract database, which is often accessed by biomedical and other specialists. As of 24 March 2013, it contains over 22.6 million records of journal articles and books indexed by MEDLINE, Index Medicus, and PubMed, going back to 1966 and selectively to 1809. Some of the old journals have full citation records in this database. For example, over 171,130 articles of the *BMJ* are indexed from the first issue in 1857, with over 155,900 items being linked to the related full-text articles in PubMed Central. With over 162,700 indexed items, complete PubMed coverage has also been achieved for the top journal *Science*. PubMed is also linked to the NCBI Bookshelf, which is an increasingly popular database of selected online books in the life and health sciences.

Rapid updates, ease of access, diverse functionality, and retrieval of relevant information make PubMed the primary biomedical search platform. Although individual and journal impact factors are not calculated by PubMed, it is still widely searched by editors and publishers looking for editorial team members and reviewers with current and most relevant research activity Gasparyan AY, Kitas GD.(2012). Searches through PubMed also form the basis for systematic literature reviews. Gasparyan AY eta al (2011).state that authors, reviewers, and editors may greatly benefit from the services of PubMed by improving their knowledge of its core components. MEDLINE is the premier abstract database of the US NLM, which became freely available via PubMed in 1997. Several database vendors such as EBSCO and Web of Knowledge also provide access to the same database. Over 5,500 journals in medicine, nursing, pharmacy, biochemistry, dentistry, and veterinary medicine are indexed in MEDLINE, with most abstracts dating back to the 1950s. The number of journals is growing, with about 120 journals being newly indexed each year . Many journals in chemistry, physics, engineering, sociology, and science communication with relevance to the life sciences have also been accepted for indexing since 2000. MEDLINE indexes more than 8,800 articles of *The Cochrane Database of Systematic Reviews (Online)*, which is the core component of The Cochrane Library and the premier source of evidence in health care.

Another distinctive feature of MEDLINE is its reliance on the MeSH controlled vocabulary of the US NLM, which helps retrieve specifically tagged items through the Entrez search engine. The indexed journal articles initially appear on the PubMed interface without anchoring in the MeSH vocabulary. It takes several months, if not a year, to link the articles with the MeSH terms. The process of updating and expanding the list of search terms also takes a long time, which limits the functionality of MEDLINE. As a prime example, 'bibliographic databases' was introduced as a MeSH term in 1991, though the first article tagged with this term was published back in 1966.

Currently, approximately 2.7 million articles indexed in PubMed are also archived in PubMed Central, a free (full text) digital archive of the US NLM. However, not all of these articles are indexed in MEDLINE. PubMed Central has its own literature selection committee, which have archived many online journals based on their own technical and scientific criteria. Applications from journals wishing to be archived in PubMed Central require the journals to provide contents of at least 50 recently published articles, presented in a compatible XML (Extensible Markup Language) format. The archived items receive unique identifiers in PubMed Central (PMCID) and PubMed (PMID), with abstracting in PubMed and corresponding entries in the Web of Knowledge and EBSCO platforms.

The PubMed Central archive also serves as a repository for NIH-funded authors, who are required to submit any article published in any journal to the NIH Manuscript Submission system for XML conversion and permanent archiving. Many other funders, such as The Medical Research Council (UK), Cancer Research UK, have also adopted similar policies for their researchers. Finally, some publishers operating both subscription and open-access publishing models may opt to selectively deposit their journal articles in PubMed Central. Relevant examples are the Springer Open Choice and Bentham Science Publishers Open Access Plus projects, which offer authors the option of depositing their articles from subscription journals in PubMed Central after payment of open-access fees. Despite the visibility in PubMed, journals archived in PubMed Central but not indexed in MEDLINE are poorly retrievable because their abstracts are not tagged with MeSH terms. The website provides some tips on effective searching using Boolean terms, for example, to effectively search within a journal the title should be included as a keyword, using the advanced search.

- **EMBASE**

EMBASE is the largest subscription-based biomedical and pharmacological abstracts database. EMBASE, an Elsevier product, contains over 25 million records from 1947 to the present. It indexes over 7,600 journals. Similar to Scopus, EMBASE covers all items indexed by MEDLINE. However, EMBASE contains 5 million more records than MEDLINE, including many European and non-English sources. The distinctive features of EMBASE are its focus on drug-related sources and reliance on the EMTREE thesaurus, an Elsevier product which lists over 56,000 drug and medical terms for EMBASE and EMBiology (a specialised database launched by Elsevier in 2005).

Several studies have found that EMBASE covers controlled clinical trials more comprehensively than MEDLINE. For example, 16% more trials on rheumatoid arthritis, osteoporosis, and low back pain are indexed in EMBASE . Suarez-Almazor ME,et al (2000). More extensive coverage in EMBASE also relates to therapeutics and adverse effects of drugs Woods D, Trewheellar K. (1998). However, more extensive coverage does not necessarily mean more quality items, and this is why it is recommended that EMBASE is complemented by MEDLINE and/or other evidence-based databases Wilkins T, Gillies RA, Davies K. (2005).

- **The Cochrane Library**

Cochrane Library is a specialised collection of databases for evidence-based information, which was designed by the Cochrane Collaboration. It is part of the Wiley Online Library. Though the Cochrane databases are subscription-based, these are now freely accessible in most developed and developing countries, partly due to the WHO's HINARI project. The following three databases are developed by the Cochrane Collaboration experts:

- The Cochrane Database of Systematic Reviews is an online periodical, indexed in MEDLINE and Web of Science, which contains peer-reviewed systematic reviews of the Cochrane Review Groups.

- The Cochrane Central Register of Controlled Trials (CENTRAL) is the main hub for articles on controlled trials.

- The Cochrane Methodology Register (Methodology Register) contains a bibliography of articles on methods of controlled trials.

The Cochrane systematic reviews and trials registry are the main sources of evidence-based medicine, which may offer references for systematic reviews and meta-analyses, complementing those from MEDLINE and EMBASE databases.

The Centre for Reviews and Dissemination, a UK-based organisation, designed three additional databases of the Cochrane Library:

- Database of Abstracts of Reviews of Effects (DARE);

- National Health Service Economic Evaluation Database (NHS EED);

- Health Technology Assessment Database (HTA Database).

These three databases focus on systematic reviews and other articles of economic assessments of drug therapies and health technologies around the world. Health policy experts and administrators often refer to these databases when they take evidence-based decisions.

V. CONCLUSION

Some of the current databases combine features of libraries, search engines, indexing, and citation tracking services (for example, PubMed Central). Others list journal titles and provide access to their websites and contents, but do not have a system of keywords tagging and tracking citations (for example, Directory of Open Access Journals, UlrichsWeb®). Most international databases predominantly index English sources. This limitation is partly overcome by national abstract and/or citation indexes. Though the coverage of national databases may overlap with international databases, they often provide basic visibility for unique local, non-English periodicals, books, and other items Suh CO, Oh SJ, Hong ST (2013). Not all national indexes, however, have strict indexing criteria and list quality items. The proliferation of specialized journals and the multidisciplinary direction of current research studies allow most authors to publish their works in directories which are far from their narrow field of specialization. As a good example, in a landmark study on bibliographic performance of rheumatology in MEDLINE, EMBASE, and BIOSIS, 45% of papers on hot topics in the field were found in non-rheumatology journals and each of these databases was capable of retrieving no more than 50% of the relevant citations (Ramos-Remus C, 1994).

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