

INICAE V20, N1, March 2001

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HANDLING OF BIOMEDICAL INFORMATION IN THE ELECTRONIC TECHNOLOGY ENVIRONMENT

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0 INTRODUCTION

The habitat of biomedical information has been shifted from the traditional print media to the newly evolved electronic media. The electronic media is more fitted to face the challenge caused by the exponential growth of biomedical knowledge. Through the new medium, it's possible for getting access to the relevant information, from the vast amount of biomedical literature, regardless of its location. "The value of electronic information is that, it can be easily shared, distributed, up-dated, manipulated and rapidly searched. A feature of the current electronic information environment is the apparently seamless way in which resources are networked and accessed across different computing platforms".^[1]

The new medium gave birth to many electronic biomedical information products in the form of on-line databases, CD-ROMs, internet and www resources etc. This process of generating, different varieties of offsprings will continue at an accelerated rate with the advancements in technology.

The development in electronic environment and the invention of new biomedical information products have significantly changed the role of biomedical librarian. It alters his traditional responsibilities, as the electronic information products can no longer regard as static and physical entities of print media. The electronic biomedical information products can take multiple formats and are dynamic in nature. The biomedical librarian is compelled to modify the selection, organisation and dissemination process and to acquire new skills as the traditional approach is not at all feasible towards the electronic products.

1 AN OVERVIEW OF ELECTRONIC BIOMEDICAL INFORMATION PRODUCTS

With the phenomenal pace of advancements in technology, many different forms of electronic biomedical information products started appearing

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in the global market. Thus the electronic biomedical information environment houses, traditional on line databases, different versions of compact discs, and the recently emerged internet and web-based resources. The same biomedical information is published through more than one format mentioned above, in some cases. For example, MEDLINE, an electronic information product of NLM (National Library of Medicine), USA, is available as an online database, as a CD-ROM database, and as a web resource. Also the same biomedical information may appear both in print and electronic media. An overview of different electronic biomedical information products is provided below:

1.1 ONLINE DATABASES

1.1.1 ONLINE BIBLIOGRAPHIC DATABASES

MEDLINE^[2] is the premier online bibliographic database of NLM, covering the fields of medicine, nursing, dentistry, health care system and pre-clinical science. The database include bibliographic citations, and author abstracts from approximately 4,300k current biomedical journals published from USA and 70 foreign countries. The file contains approximately 9 million records dating back to 1960.

PRE MEDLINE^[3], an on-line interim database is introduced by NLM in August 1996, which provides basic citation information and abstracts before the full records are prepared and added to MEDLINE. New records are added to PRE MEDLINE daily. The completed records are added weekly to the MEDLINE and deleted from the interim PRE MEDLINE database.

MEDLINE PLUS^[4] is a "gold-mine of up-to-date quality health care information" from NLM. MEDLINE PLUS, provides access to the public with the most reliable and authoritative information regarding their personal health and health of their families, information about specific diseases and conditions etc.

BIO-ETHICS LINE^[5] is another on-line database of NLM, which covers the ethical, legal and public policy issues related to the health care. The subject areas include human experimentation, organ donation, euthanasia etc.

In addition to MEDLINE, MEDLINE PLUS, PRE-MEDLINE, BIOETHICS LINE, NLM, host many other on-line bibliographic databases, such as DOC-LINE, AVLINE, POPLINE, TOXLINE etc.

EMBASE^[6] is a biomedical and pharmacological database which gives access

Inclusion of drug-related information makes EMBASE particularly valuable.

Biosis previews^[7] is the electronic version of Biological Abstracts and Biological Abstracts/RRM (Reports, Reviews, Meetings) available on-line. It encompasses the entire field of life sciences and provides coverage of the world's biological and bio-medical research. It includes traditional areas of biology, such as Botany, Zoology, Microbiology as well as experimental, clinical, and veterinary medicine, bio-technology, environmental studies, and agriculture. Inter disciplinary fields such as biochemistry, bio-physics, bio-engineering are also included. About 5,500 journals and 1,500 international meetings are monitored for inclusion. CANCER LIT^[8] is the on-line database of National Cancer Institute, USA. The database contains references to the published journal articles, meeting, govt reports, monographs, and other sources covering cancer and related topics.

In addition to the above, there are many other on-line bibliographic database services in the field of medicine functioning from different parts of the world.

1.1.2 ONLINE FULLTEXT DATABASES

Evidence-based medical reviews^[9] is an on-line full text database designed to use by academicians, researchers, and students. Reflecting on current practice in medicine to base clinical decisions on accumulated evidence from the primary medical literature, evidence-based medicine review provides contents from two premier sources: 1) Cochrane database of systematic reviews, 2) Best evidence.

HSTAT^[10] is the on-line full text database of NLM, in clinical practice guidelines. It contains the US preventive services Task force's guide to the clinical preventive services, the National Institute of Health's (NIH) consensus development conference statements, the Agency for health care policy research's clinical practice guidelines, the HIV/AIDS treatment information service, and NIH's technology assessment conference summaries.

1.2 CD-ROM DATABASES

1.2.1 CD-ROM BIBLIOGRAPHIC DATABASE

EMBASE, MEDLINE, BIOSIS previews etc are available in CD-ROM formats also and provide bibliographic information like their on-line counterparts.

1.2.2 CD-ROM FULL-TEXT DATABASE

reports and letters to the editor of approximate 740 scientific journals in the biomedical, chemical and pharmaceutical disciplines.

1.3 BIOMEDICAL INFORMATION PRODUCTS OF THE INTERNET

Bulk of biomedical information is available through the Internet and www. These are scattered in different sites.^[12] Digital information on the internet is characterized by the fact that, digital documents can exist in several formats possibly in several versions, in locations that are not yet fixed.

1.31 MEDICAL DATABASE

Internet provides access to bio-medical databases containing both full text and bibliographic information. These are freely available medical database.

1.32 DIRECTORIES AND CATALOGUES

Directories and catalogues help to locate specific biomedical information sites. MEDCAT^[13] the catalogue of New York University enlists biomedical information sources of the library. It also provides access to on-line catalogues of other health science libraries.

1.33 ELECTRONIC JOURNALS

There are electronic journals in biomedicine available through internet. Some of these biomedical journals are published exclusively in electronic format, e.g. *Online: Journal of Current Clinical Trials*, which is the first peer-reviewed, totally electronic scientific journal with no paper counterpart. Many of the electronic journals currently available through the Net are simply electronic versions of the titles already in print form, e.g. *Journal of American Medical Association*, *the Lancet* etc.

1.34 SEARCH ENGINES

There are some search engines in the medical field, which provide access to biomedical information sites. These include^[14-16] med-Explorer, Medical World Search, Medlink, Med Finder, Health A to Z.

1.35 MEDICAL INFORMATION SERVICE AGENCIES

There are some service agencies which select and organise relevant and useful biomedical information sites and provide access to these sites. These include: (1) Medscape,^[19] which is a leading interactive, multispecialty commercial web service, for clinicians and consumer, (2) BIDS,^[20] (Bath Information Data Service) which is the world's first national service providing access to commercially supplied bibliographic databases, including medicine; (3) OMANI,^[21] (Organising medical networked information) is UK's independent gateway to high quality bio-medical resources on the net, (4) OVID^[22] provide access to bibliographic and fulltext database for biomedical community

1.36 EMAIL AND MAILING LISTS

Through e-mail, clinical images, graphics, charts and other patient data can be send. Mailing list subscriber can communicated with a number of experts and can exchange new ideas, discuss clinical problems, and can get access to the up-data practice recommendations from leading organisations.

2 SELECTION OF ELECTRONIC BIO-MEDICAL INFORMATION PRODUCTS

Selection of relevant information products to satisfy different categories of health professionals is one of the key issues faced by the biomedical librarian. This is true in case of both print and electronic information products. But the selection of electronic materials is far more a formidable task, when compared to that of print materials.

The major issues involved in the selection of electronic bio-medical information products include:

- Many different forms of electronic information products are available in the market, supplied by different vendors. The enormous choice of materials and large number of vendors create problems in selecting the most appropriate, efficient and cost effective bio-medical information products from reliable vendors.
- Non-compatibility and non-standardisation in the production and distribution of electronic information products. Electronic information is available on different machines, working on different platforms using different softwares.
- Copyright issues and licence agreements related to electronic products are making the selection process an insurmountable barrier.
- Most of the electronic information products are of high cost. On the other hand, budget allocation of libraries are minimum.
- Prevalence of uncertainty regarding the shelf life of many of the web resources.
- Uncertainty regarding the accuracy, acceptability and authentication of information.

3 ORGANISATIONS OF ELECTRONIC BIO-MEDICAL INFORMATION PRODUCTS

In a traditional print environment, the bio-medical librarian is concerned with the physical organisation of the internal collection whereas in the electronic environment, which is characterised by 'information access', the emphasis is shifted from the organisation of internal collection to that of a vast amount of external information products.

The organisation of electronic resources is very difficult because of the following facts:

- The structure of electronic resources are non-coordinated in nature:

- The electronic products such as those available through web are arranged in non-linear fashion with links;
- The scope is very vast;
- Electronic information products are instable, in most cases. There is no firm guarantee that resources held and maintained at remote locations once catalogued would continue to be available to users later;
- Multimedia nature of copients.

The tools and techniques employed for the organisation of print materials can also be used to organise electronic information products, e.g. BUBL [23] site in the internet has been making use of DDC for organising its database. Different search engines such as Yahoo, Attavista etc are making attempts towards organising the internet resources by classifying according to the subject.

OPAC is another tool which can be used to organise electronic products. There are OPACs which are available on the internet, called internet OPACs or Web OPACs. Many medical institutions are providing Web OPACs to their collections.

Individual medical libraries can create home pages on the Web, through which they can provide organised links to different useful bio-medical information websites. The relevance and utility of the sites should be evaluated before establishing links.

In an attempt to organise the internet resources, a group of information professionals, standard makers and internet and computer professionals met in Dublin, in 1995, [24] and identified a core of 13 meta data elements in order to describe an electronic resource. Two more elements were added later, by making the total number 15.

OMNI (Organising Medical Networked Information) is a UK's gateway to high quality biomedical internet resources in the field of biomedicine, allied health, health management and related topics. It provides a comprehensive coverage of the UK resources in biomedical area and access to the best resources world wide.

UMLS [25] (Unified Medical Language System) is a project of National Library of Medicine in order to organise and get access to the scattered bio-medical information, in different electronic resources. UMLS organises the electronic information by making use of 4 knowledge bases:

- 1 Meta thesaurus;
- 2 Specialist Lexicon;
- 3 Semantic Networks;
- 4 Information source map.

2 DISSEMINATION OF BIO-MEDICAL INFORMATION

The dissemination of information held within the library and remote locations to its users is one of the most important functions of the medical libraries. The electronic environment provides opportunity to disseminate information quickly, conveniently and efficiently than even before. Most online services now offer possibility of using their databases to create a current awareness service. This is extremely useful for monitoring quickly changing and time critical biomedical information. Internet helps to enhance the selective dissemination of information by providing up-to-date biomedical information which the library professional scan periodically scans and filter them to suit the user needs and can e-mail them.

Table of Contents service is provided by many electronic publishers as a means of marketing their products, e.g. Uncover a Table of Contents service offers Table of Contents from more than 17,000 journals, including bio-medical journals.

Other than, table of content, abstracts, synopsis, commentaries etc related to the bio-medicine can be down loaded by the individual library, from different sites and posted on the library's homepage. The dissemination of information in electronic format, facilitate easy re-formatting and re-packaging.

5 SKILLS NEEDED FOR THE BIO-MEDICAL LIBRARIAN IN THE ELECTRONIC ERA

In order to perform his duty successfully in the electronic environment, the bio-medical librarian has to acquire a set of new skills and competencies, and at the same time he has to use his traditional skills in a different way. The skills needed for the bio-medical librarians, working in an electronic environment include:

- 1 He should have a thorough knowledge of biomedical knowledge structure, medical terminology, medical education and training patterns, famous medical institutions all over the world;

- 2 The biomedical librarian should have knowledge about the vendors of information industry, who provide bio-medical information products.

- 3 Skills to evaluate the different electronic information products provided by different vendors and select the best out of them keeping in view the information needs of health professionals. The willingness of most vendors to offer free trials of both on-line and CD-ROM databases should be utilized for the purpose of evaluation.

- 4 Ability to negotiate with different vendors of information industry.

- 5 In order to deal with the copyright issues and license agreements, legal expertise is essential for biomedical Librarian.

- 6 Thorough knowledge of different computer hardware and software technologies suited for the electronic information environment.

- 7 Ability to function as a network administrator and to deal with the technical issues of networked environment.
- 8 Skills to design multimedia information products, as the multimedia database makes a tremendous impact on the users than ordinary database.
- 9 Ability to design directional and informative webpages.
- 10 Ability to utilize time saving search strategies and knowledge of different database structure. He should up-date his searching skills frequently.
- 11 Ability to provide adequate training for the users. As a part of training program, he should be able to design good quality guides/manuals explaining the varieties of skills needed to retrieve information effectively in the electronic environment.

6 CONCLUSIONS

The development in information technology is transforming the biomedical information in a dynamic way. New electronic products are being generated and the existing forms are getting modified. It doesn't mean that the traditional print products are totally extinct. The print materials will continue to be used in varying degrees for a long time. The print and electronic collection of a biomedical library supplements each other. In the new environment, the reputations of a biomedical library will be measured not only on the basis of the size of its holdings, but also on the basis of the quality information access that the library provides to the users. This in turn can be done by fitting the relevant and qualitative biomedical information avoiding the filthy information.

The selection organisation and dissemination of electronic information products are the major challenges faced by biomedical librarian in the electronic environment. In order to face these challenges effectively, the electronic librarian has to expand his knowledge base into new areas of bio-medical librarian has to expand his knowledge base into new areas of expertise. The professional will not be in existence in the new millennium unless the information professionals begin to seek life long education and professional development opportunities from a variety of sources.

REFERENCES

- 1 SCAMMEL Alison. The role of the special librarian in the electronic era. In: Scammel Alison, ed: *Handbook of Special Librarianship and Information Work*. 7th Ed. UK: Aslib. 1997. p 3- 11.
- 2 <http://www.nlm.nih.gov/pubs/factsheets/medline.html>
- 3 <http://www.nlm.nih.gov/pubs/factsheets/on-line-databases.html#premedline>.
- 4 <http://www.nlm.nih.gov/pubs/factsheets/on-line-databases.html#medline-plus>
- 5 <http://www.nlm.nih.gov/pubs/factsheets/on-line-databases.html#Bio-ethicsline>.

- 6 <http://www.elsevier.nl/inca/publications/store/5/2/3/3/2/8>.
- 7 <http://www.biosis.org/html/products-services/previews.html>.
- 8 <http://www.meb.uni-bonn.de/cgi-bin/cancer-ht-Search>.
- 9 <http://www.med.virginia.edu/lrs-library/newsletter/1998/October/emb.html>.
- 10 <http://www.nih.gov/pubs/factsheets/hstath.html>.
- 11 <http://www.adonis.nl/index.htm>
- 12 CLEVAND Gary and KUNY Terry: The digital library: Myths and challenges (*FLA Journal* 24(2), 1998 p 107-113).
- 13 <http://medcat.med.nyu.edu/screens/medcatstest.html>.
- 14 <http://www.medexplorer.com/info.htm>.
- 15 <http://www.rnwsearch.com>
- 16 <http://www.websurg.avonrip.co.uk/med-isp/medlinks.htm>.
- 17 <http://www.nlm.nih.gov/medline/medfinder.htm>.
- 18 <http://www.HealthAToz.com>.
- 19 <http://www.medscape.wm>.
- 20 <http://www.bids.ac.uk>
- 21 <http://www.omni.ac.uk>
- 22 <http://www.ovid.com>.
- 23 <http://www.bubli.ac.uk/link/ddc.html>.
- 24 http://linnea.helsinki.fi/meta/dc_draft.html.
- 25 <http://www.web.nlm.nih.gov/sampler/umls.html>.

INICAE V20, N1, March 2001

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DIGITAL LIBRARIES: PROJECT PLANT AND FEATURES

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0 INTRODUCTION

The present day technological developments in computer and communication have paved the ways for electronic information access. The network collections of electronic information provide global access to multi-media knowledge resources distributed at various geographical

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