COMPARISON OF FEATURES OF ONLINE JOURNALS AND DATABASES

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Abstract

The objective of the study was to examine and make a comparison of the features of online journals and databases available at the Library, University of Moratuwa during the year 2006. A total of nineteen online resources including nine online databases and ten online journals were examined. The systems were assessed under two criteria, the user friendliness and the functionality. The user friendliness features were assessed under the design of the web pages and the type of the interface, personalisation and database selection. Access and retrieval of information, results manipulation and availability of help menu were considered under the functionality features. Boolean operators, phrase searching, field specific searching, wildcard and truncation were observed as common retrieval features. The interpretation and implementation of these features were different among the systems. The greatest differences were found in the area of query formulation. Lateral searching, reference links and searching with table of contents were identified as the unique features.

Key Words: Online databases, Information retrieval, Electronic Journals

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1. Introduction

There were three main important stages in information revolution. The first information revolution occurred when man developed reading and writing skills as a medium of communication. The second revolution started with the invention of printing press. The third revolution began when computer technology was applied to information handling in the 1950s. Since then, the revolution has continued with technological developments in the field of computing, electronics, and telecommunication, with a vast development in all areas of information services.

The amount of information, which was added as new information, was growing at an incredible rate. The traditional libraries have faced many challenges in catering to the information needs of the library users with conventional library approaches. Many of these problems have started due to the massive growth of information in different formats and rapid development in technology. Libraries had to find many solutions when addressing the information needs of the modern information driven society.

Relevancy or accuracy of retrieved information and the time consumed for retrieving information were some important factors that should be considered by the libraries. There should be standard mechanisms to find relevant sources of information within a shorter period of time for the people who were seeking information. Conventional library procedures and materials have limitations in meeting information needs of the emerging new generations. Therefore the libraries had to find new strategies of fulfilling the requirements of modern user.

Electronic resources have created a major impact on modern libraries as information sources in contrast to print sources. Many reputed indexing and abstracting journals have appeared as electronic bibliographic databases and information retrieval systems. They have offered fast access to information through the computers. Electronic resources are popular among the librarians and library users due to several factors (BIAD 1998).

a. Speed

By using electronic databases, it was possible to search information in considerably less time compared to the time taken to search an equivalent print source.

b. Flexibility

Electronic databases allowed a greater number of access points than printed equivalents. It was also possible to search for complex combinations of terms.

c. Range

Connecting to an online host system allowed access to a wide range of information without having to move from the terminal. Using several electronic databases, an individual could make a very comprehensive search on a particular topic.

d. Currency

Online databases were usually updated more frequently, some on weekly or even daily basis depending on the type and currency of the information stored. CD-ROM databases tended to be updated on three, six months or annual basis.

Libraries have realized the benefits of using the electronic databases over the past several years. There were different types of electronic databases, which include different types of information. This information could be found in machine-readable form or digital form, which could be processed by computers and other data processing equipment. Electronic databases could be stored in different media such as magnetic or optical. Also they could be accessed either locally or remotely. Today, many libraries in the world have recognized online databases as essential sources for information retrieval and libraries have started to switch towards the concept of electronic library.

Othman and Halim (2004) conducted a user survey to examine the common and unique retrieval features of online databases and the difficulties faced by

the users in applying those features. Also they studied the new retrieval features expected by the users. The study identified that all database systems had two levels of searching mechanisms, such as basic and advanced searching methods. Further, all databases had options for producing information according to the subject and the year. Different kinds of users preferred different levels of retrieval techniques.

The need for human – centred interface design was stressed by Battleson, Booth and Weintrop (2001). They argued that an interface must be simple to learn, remember and the design should follow International Standards Organization (ISO) definition of usability for web technology. Vilar and Žumer (2005) conducted another study to assess whether online database systems were designed according to accepted standards and guidelines. There were many differences among the different online databases. The main difference was found in the characteristics and complexity of the levels of query formulation. Another significant difference appeared in interface language and types.

According to Eastern and Jansen (2003), Boolean operators, keyword, phrase and field searches were the main retrieval features offered by majority of the databases. Kline (2002) conducted a study to examine the specific problems of the users in searching online resources. He grouped these problems into four categories; searching difficulties, retrieval issues, document discrimination problems and interface design quandaries. Also providing a help menu in an information retrieval system was very important because users could obtain the guidance from those help menus in critical situations. Other than supplying users with help menus, training and advisory facilities were also found to be essential for effective search strategies (Othman and Halim 2004).

The University of Moratuwa Library (UoML), Sri Lanka is one of the most prominent engineering libraries in the country. Its main areas of specialisation are Engineering, Architecture and Information Technology. It was the first fully automated University library in Sri Lanka. Computers and computer applications

have been widely introduced within the library and an integrated library management system (Libsys) has been installed since 1998. Library, University of Moratuwa has provided access to number of e-resources. Among those online resources some were subscribed, namely IEE, IEEE, Emerald Insight and ACM Digital Library and they were available throughout the year 2006. Under the PERI (Programme for the Enhancement of Research Information) project several online databases were available for the users. PERI operated under International Network for the Availability of Scientific Publication (INASP), in conjunction with SIDA (Swedish International Development cooperation Agency). Blackwell – Synergy, Ebscohost, Wiley Interscience were major full-text databases offered through PERI. There were some online journals, which offered free access with its subscription of the print versions. Archaeological Dialogues (Formerly Architecture Research Quarterly), The Economist, Hydrological Sciences and Engineering News Record (ENR) were those free access online journals.

2. Purpose of the study

The objective of this study was to examine and compare the common and unique features offered by online journals and databases, available at the library of University of Moratuwa. Although the library provides online resources, a study has not been carried out to find out their capabilities for information access and retrieval.

2.1 Research approach

This study investigated the different features of nine (09) online databases and ten (10) online journals available at Library, University of Moratuwa during January to December 2006. In the evaluation criterion of the databases, two main features of the online databases were considered.

1. Features related with user friendliness
2. Features related with functionality

Design of the web pages & type of the interface, personalisation and database selection were examined under user friendliness features. Under the functionality features, three system functions which related with user interface were examined taking into consideration information retrieval, results manipulation and availability of help menu.

3. Results

The features of each available online journals and database at Library University of Moratuwa have been presented in Table 1 and Table 2.

3.1 Interface features

Almost all the online databases had similar interface designs. Most of them have been designed with very simple web designing architecture. All the databases have avoided embedding many images to their web pages. All the databases had textual interfaces. Also they have used a limited number of colours. English was the only available language for all the databases. The databases like ProQuest Direct and JSTOR (both not available at University of Moratuwa) had provided an interface with different languages (English, German, Spanish, French, Korean and Chinese). Standard options (shortcuts) were available in all database systems. These shortcuts normally appeared as menus at the top or left side of the web page (e.g.: “Search”, “Browse”, and “Edit Query”, “Help”).

Table 1: Features of online resources available at Library, University of Moratuwa

N=18

Features \ Online Database	Blackwell – Synergy	EBSCOhost	Ingenta	African Journals Online (AJO)	Wiley Interscience	National Academic Press	World Bank Publications	American Society of Agricultural	Beech Tree Publishing	IEE	IEEE	ScienceDirect	ACM Digital Library	Archaeological Dialogues	The Economist	Engineering New –Record (ENR)	Hydrological Science Journal	Emerald Insight
INTERFACE FEATURES																		
Textual interface	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Graphical Interface	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
More than one language	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Shortcuts	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	X
PERSONALIZATION																		
Selecting number of records per	√	X	√	X	X	X	X	X	X	√	X	X	X	√	X	X	√	√
E-mail SDI service	√	√	√	√	√	X	√	√	√	√	√	√	√	√	X	X	√	√
Search History	√	√	√	X	√	X	X	X	√	X	X	√	X	X	X	X	X	√
Refining search history	√	√	√	X	√	X	X	X	√	X	X	√	X	X	X	X	X	√
DATABASE SELECTION																		
Selecting databases as users' requirements	X	√	X	X	√	X	X	X	X	X	X	X	X	X	X	X	X	X

X – Not Available √ - Available

3.2 Personalisation

Blackwell Synergy, Emerald Insight, Ingenta, Archaeological Dialogues, IEE and Hydrological Science Journal allowed the users to decide the number of

records for displaying in one page. It varied from 5 to 50 records per page. Hydrological Science Journal allowed a range of 10 – 30 records per page and IEE allowed a range of 5 – 50 records per page. Other four databases had a range of 10 – 50 records per page. All the other remaining databases had their own number of records per page.

A personal profile included some typical features such as saving of queries, an e-mail SDI services and other additional features. E-mail SDI service meant that the user was periodically informed regarding events and other news corresponding to certain criteria of the database through email. With the personal profile features, the user could make a personal choice according to favourite journals or subjects. Facilities for the personal profiles have not provided in African Journal Online, Ingenta, National Academic Press, American Society of Agricultural and Biological Engineers, Beech Tree Publications, The Economist and Engineering News Record.

3.3 Database selection

Ebscohost, Wiley Inter Science and Science Direct have incorporated the function of database selection. It was possible to use one database, more than one or all databases simultaneously. Ebscohost had seven databases and Wiley Inter Science included eleven databases. The first database in the list (Academic Search Premier) was the default database in Ebscohost. Only one database could be selected at a time from the eleven databases in Wiley Inter Science. Under each database, there were four options to select for the users. Selecting articles by contents, articles, titles and subjects were those four

options. Science Direct has offered this function in a different way. This function was incorporated into the search interface in Science Direct database. The default choice was all the databases and then the user had the opportunity to change the databases.

3.4 Information retrieval

3.4.1 Multiple search levels

Other than the African Journal Online and Engineering New Records (ENR), all the other systems have offered two levels of searching mechanism (Basic and Advanced). The functionality and the features of these two mechanisms were almost similar in all the systems except few differences. These two searching levels have been clearly mentioned in some database systems. But in some systems there was no evidence to identify two different levels of searching. They have one searching system with the simple as well as advanced searching features.

African Journals Online (AJOL) and Engineering News Record (ENR) have provided very simple search interfaces. Searching has to be conducted with single text box in the interface. Ebscohost's basic search level has offered one search field enabling simple entry of search terms. By default, the whole record was searched. The search terms will be combined with Boolean operators. "AND" operator was the default operator, if the user has not entered operators between the search terms. In the advanced search level, there were more search limiters. In this level three search fields have been provided with "AND", "OR" and "NOT" operators. Also the users could select the place where the

search terms should be examined (e.g.: all text, author, title etc). There were several limiters and expanders with both basic and advanced search fields (availability of full text and scholarly journals, published dates and publication types etc.).

In Blackwell Synergy, simple search could be conducted through a single search field. Users had many search fields in the advanced search level (e.g.: full text, author, title, publication year etc). Users could select all the journals or a particular journal. Also they could select all the subject areas or a particular subject area. Wiley InterScience database had two options in its simple search level. Users were able to select either all contents or specific publication (e.g.: journal, book, database etc). Single search field was provided in simple search level in Wiley InterScience. Three search fields were available in advanced search level with “AND”, “OR” and “NOT” operators. Also there were additional features to limit the search result (article title, author, ISSN etc).

IEE has provided one search field in its simple search level. Users could use any key word for their searching. Many features have been provided in IEE advanced searching level. Users have been offered the facilities to select all journals, magazines or conferences or they could select a particular journal, magazine or conference. There were some additional limiters which would narrow the search results (e.g.: full bibliographic details, title, author, abstract, keywords etc).

Table 2: Information Retrieval Techniques of online resources available at Library, University of Moratuwa (N=18)

Online Database / Features	Blackwell – Synergy	EBSCOhost	Ingenta	African Journals Online (AJO)	Wiley Interscience	National Academic Press	World Bank Publications	American Society of Agricultural	Beech Tree Publishing	IEE	IEEE	ScienceDirect	ACM Digital Library	Archaeological Dialogues	The Economist	Engineering New –Record (ENR)	Hydrological Science Journal	Emerald Insight
INFORMATION RETRIEVAL																		
Simple S	√	√	√	X	√	√	√	√	√	√	√	√	√	√	√	X	√	√
Advanced S	√	√	√	X	√	X	X	X	X	√	√	√	√	X	√	X	X	√
Boolean S	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Wildcard S	X	X	√	√	√	√	√	√	√	√	√	√	√	√	X	√	X	√
Proximity S	√	√	√	X	√	X	X	X	X	√	√	√	√	X	√	X	X	√
Exact W./Phrase S	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Nested queries	√	√	√	√	√	√	√	X	√	√	X	X	√	√	√	X	X	√
Search limit/expand	√	√	√	X	√	X	√	√	√	√	√	√	√	√	√	X	X	√
Subject S	√	X	√	√	√	√	√	X	√	√	√	√	√	√	X	X	X	√
Journal Browse	√	X	√	√	√	√	√	√	√	√	√	√	X	√	X	X	X	√
Relevancy Ranking	√	√	√	X	√	X	X	X	X	√	√	√	√	X	√	X	X	√
MANIPULATION OF RESULTS																		
Different Full-text	√	√	X	X	X	X	X	X	X	X	√	X	X	X	X	X	X	√
Select multiple reccords	√	√	√	X	√	X	X	X	√	√	√	√	X	√	X	√	√	√
Save search	√	√	X	X	√	X	X	X	X	X	√	√	X	√	X	X	X	√
Print records	X	X	√	X	√	X	X	X	√	√	√	X	√	X	X	X	X	√
Email records	√	X	√	X	√	X	X	X	√	X	X	√	X	X	X	X	X	√
HELP																		
Help menu	√	√	√	X	√	X	√	X	√	√	√	√	√	√	√	√	√	√

(X – Not Available √ - Available)

Most of searching facilities of IEEE database were very similar to IEE database. It has provided four levels of searching (basic, advanced, author and cross reference). Basic search level was similar to IEE basic level. In advanced searching level there were two options for the users. Features of option – I was same as the IEE advanced features. Users could limit the search with specific collections or specific year. Also users could select the display format (citation or citation and abstract) of the results and they could arrange their result according to the relevancy or descending – ascending order. With the option – II facilities, users were able to use descriptive details on their search.

Science Direct had three levels of searching (Quick Searching, Basic Search and Advanced Search). The full search features of Science Direct were not available for guest users. However, they could search using Quick Search. Basic Search has provided pre-defined fields that the user could use to search all available documents, journals, or books. Users could limit their search with document type (all sources or journals or books), publication type (journals, book series, handbooks, reference works), date period and subjects. In the advanced search, users were able to use Boolean operators to search all documents, journals, or books. Users could build complex searches using Boolean operators, proximity operators and wildcards.

ACM Digital library has also provided two levels of searching. Its basic search level had one search field with two optional features. Users could limit their search either to ACM Digital Library resources or the guide. Advanced search level of ACM Digital Library was very complicated and users have been offered

many features to limit their search. There were four separate search options in advanced search level. Users could use one option at a time. In the option – I, users could enter any word or key word or phrases. Users could limit their search to title, abstract, review or all the information. Option – II has provided the facility to search through the ISSN and ISBN numbers. Selection of publisher, place of publication, period of publication and the type of publication was allowed in option – III. Required subject area and the form of the result (full text, abstract or review) could be selected in option – IV.

One search field has provided in Emerald's basic search level. By default all the bibliographic fields were searched. Users had the freedom to select several access points to limit their search by clicking check boxes. Eight options were offered including abstract, article title, author, key words etc. Searches could be further limited by selecting either phrase or exact match or all content or my described content. The advanced search level has offered three changeable fields with menus of eight access points (author, article title, journal, ISSN etc). Boolean operators could also be used from the additional menu. There were some search limiters such as selection of all contents or subscribed contents or publication period or article type (conceptual paper, case study, literature review etc).

3.4.2 Boolean operators

Boolean operators have been offered in four different ways. Those four ways were, pull down option, separate text box for typing search terms, different box for each operator and automatic "AND" operator for multiple terms. Boolean

"AND" has used as the default operator between the search fields and search words, even though the user has not specified it. Otherwise user had to enter the operators between the words or phrases. This was common to simple search level of all the databases other than ScienceDirect. Pull down option was provided for Boolean operator selection in ScienceDirect database. Most of the databases have offered pull down option of Boolean operators in their advanced search level. Ebscohost, Wiley Interscience, IEE, IEEE and Emerald Insight have provided this pull down option.

3.4.3 Truncation and wildcard characters

Blackwell Synergy did not support for truncation or wildcard features. Other than truncation with a character, Emerald database had an alternative truncation option. In Emerald database truncation could be performed either by using the "*" character or by ticking the appropriate "Truncation" check box. Ingenta, Beech Tree Publication, IEE, IEEE, ACM Digital Library and Hydrological Science Journal have used two types of symbols as wildcard characters. All the above mentioned journals and databases have used "?" as a wildcard character to represent one character within the search term. They have used "*" character to represent more characters within the search term. There was an exception in Ingenta database and Beech Tree Publication database. They have used "#" character to represent any word in a phrase. Table 4 has displayed the symbols used for truncation and wildcard characters.

Table 3: Commands available for searching strategies in online resources at library, University of Moratuwa

DATABASE	COMMANDS USED FOR SEARCHING
Blackwell Synergy	Quotation marks for exact words searching & phrase searching
Ebscohost	Words without Boolean operators used for multi–word searching. Quotation marks used for exact word or phrase searching
Ingenta	Double quotation marks for exact words searching & phrase searching
African Journals Online (AJO)	Whole sentence considered as a phrase
Wiley Interscience	Double quotation marks for exact words searching & phrase searching
American Society of Agricultural & Biological Engineers	Whole sentence considered as a phrase
Beech Tree Publishing	Double quotation marks for exact words searching & phrase searching
IEE	Double quotation marks for exact words searching & phrase searching
IEEE	Double quotation marks for exact words searching & phrase searching
ScienceDirect	Double quotation marks were used for phrase searching or exact word searching
ACM Digital Library	Search terms with spaces were treated as multi- word search terms. Double quotation marks were used for exact word or phrase searching.
Archaeological Dialogues	Double quotation marks for exact words searching & phrase searching
The Economist	By default, individual terms were combined using Boolean “AND”. For searching particular phrase double quotation were needed
Engineering New Record (ENR)	Double quotation marks for exact words searching & phrase searching
Hydrological Science Journal	By default, individual terms were combined using Boolean “AND”. Brackets () were used to search particular phrase
Emerald Insight	Check box was available for Phrase search and Exact Match in quick search as well as advanced search

Table 4: Symbols used for wildcard features in online resources available at ibrary, University of Moratuwa

DATABASE	SYMBOLS USED FOR WILDCARDS	SYMBOLS USED FOR TRUNCATION
Blackwell Synergy		
Ebscohost	?	*
Ingenta	? and #	*
African Journals Online (AJO)		
Wiley Interscience		*
National Academic Press		
World Bank Publications		
American Society of Agricultural & Biological		*
Beech Tree Publishing	?and #	*
IEE	* and ?	
IEEE	* and ?	
ScienceDirect	*	!
ACM Digital Library	* and ?	
Archaeological Dialogues		*
The Economist	*	*
Engineering New Record (ENR)		*
Hydrological Science Journal	* and ?	
Emerald Insight	*	

3.4.4 Search limiters and expanders

Most of the databases have provided search limiters and expanders. Search limiters and expanders provide a great help in narrowing or expanding the results in any search query. Most of the databases have included their search limiters and expanders in their advanced search level. Limiters such as "Publication Year", "Document Type", "Subject", "Volume" etc have been

included in all the databases. EbscoHost has provided the highest number of limiters compared to the other databases.

3.5 Manipulation of results

3.5.1 Availability of different full-text formats

There were three databases which allowed selecting the record format as user expected. Blackwell – Synergy, ScienceDirect and Emerald had provided two record formats (HTML and PDF). IEE, IEEE, Wiley Interscience, ACM Digital Library, American Society of Agricultural and Biological Engineers and Hydrological Science Journal have provided only PDF format. HTML record format was available in Ebscohost, Ingenta, Africal Journal Online, World Bank Publications, National Academic Press, Beech Tree Publications and The Economist.

3.5.2 Saving, emailing and printing records

All the systems have offered printing, saving and emailing facility of records. Saving of records was offered in Blackwell Synergy, Ebscohost, Wiley Interscience, IEEE, ScienceDirect, Archaeological Dialogues and Emerald. Printing facility was offered in Ingenta, Beech Tree Publication, Wiley InterScience, IEE, IEEE, ScienceDirect, ACM Digital Library and Emerald databases. Emailing facility of searched results was offered in Blackwell Synergy, Ingenta, Beech Tree Publication, Wiley InterScience, ScienceDirect and Emerald.

3.5.3 Search history

Saving of searching history provides the facility of re-using the same query in later time. This saves the users' time avoiding typing the same query again. Also it helps to the users to get the same results in the future. The searching history of users was automatically saved in Blackwell Synergy, Ingenta, Beech Tree Publication, Ebscohost, Wiley Interscience, Science Direct and Emerald databases. Users have been offered the flexibility to modify the previous search with small changes instead of writing whole query again. Also the uses have the facility of clearing the search history.

3.6 Availability of help menu

All the databases have included Help Menu or Online Guide in their databases except African Journals Online (AJO), National Academic Press and American Society of Agricultural and Biological Engineers. Help menus carry important information of a particular database. Usually help menus include information about the publishers of the databases, type of materials available, mechanism of subscribing, searching methods, browsing methods, new features, addresses of contact persons etc. This help menu or online guide was very helpful to the users specially for understanding the searching mechanism of each database.

4. Conclusion

According to the results of study, functionality of "Basic" and "Advanced" searching levels of the databases differ according to the systems. In some cases, the 'basic' level in one system was very similar to the 'advanced' level of another system. Generally, basic searching rules such as Boolean logic have been applied in each database system.

Unavailability of a proper user guide or help menu was one common drawback which was identified among many databases. Finding synonyms from the

thesaurus would become a difficult task to the users because thesaurus has displayed broader, related and narrow terms. Thus the users would not re-formulate their search strategies with synonyms and pseudo - synonyms.

User difficulties in using online databases mostly related with searching. Therefore more examples were needed in the help menus or online guides with the subjects' terms. Even though the databases provide many features, most of the users may have identified very limited features of the databases.

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