“COMPARATIVE STUDY OF SEARCH ENGINES USEFUL FOR LIBRARIANS”

A Dissertation Submitted to the

Tilak Maharashtra Vidyapeeth, Pune

For

Master of Philosophy (M.Phil.)

In

LIBRARY AND INFORMATION SCIENCE

Submitted By

Mr. SUSHANT KORE

Under the Guidance of

Dr. N. B. DAHIBHATE

Principal Technical Officer

Information Division (DIRC)

National Chemical Laboratory, Pune

TILAK MAHARASHTRA VIDYAPETH

DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE

PUNE - 411 037.

December, 2014

DECLARATION

I hereby declare that the dissertation entitled **"Comparative study of search engines useful for librarians"** completed by me for the degree of Master of Philosophy in library and Information Science. The entire work embodied in this thesis has been carried out by me under the guidance of Dr. N.B. Dahibhate, National Chemical Laboratory, and Digital Information Resource Center (DIRC), Pune.

(Mr. Sushant Kore)
Research Student (M.Phil.)

Place: Pune
Date: 26th December, 2014

CERTIFICATE

This is to certify that the thesis entitled **"Comparative study of search engines useful for librarians"** which is being submitted herewith for the award of the Degree of Master of Philosophy (M.Phil.) in Library and Information Science of Tilak Maharashtra Vidyapeeth, Pune is the result of original research work completed by **Mr. Sushant Kore** under my supervision and guidance. To the best of my knowledge and belief the work incorporated in this thesis has not formed the basis for award of any Degree or similar title of this or any other University or examining body.

(Dr. N.B. Dahibhate)
Principal Technical Officer
Information Division (DIRC)
NCL, Pune

Place: Pune
Date: 26th December , 2014

ACKNOWLEDGEMENT

I am very thankful to my respectable parents for their kind support in my life as well as completing my dissertation and bringing me to this stage in the educational field.

I am very thankful to my guide to Dr. N.B. Dahibhate, Principal Technical Officer, National Chemical Laboratory (NCL), Pune, without his guidance and support, this research would not have been possible. His concern and steadfast encouragement I will never forget. Dr. Dahibhate has not only been my guide but also an inspiration and torch bearer for me.

I am thankful to Mrs. Dhanistha Khandare, Head of the Dept., Library and Information Science, Tilak Maharashtra Vidyapeeth, Pune for her kind concern and consideration regarding my academic requirement. I also thanks to other library professionals for their support.

Thanks are to Late. Dr. M.B. Konnur Sir for their continued support and encouragement and providing valuable inputs in this dissertation.

Last but not the least, my all family members, friends and colleagues for their moral support, without which this dissertation would never have been completed.

ABSTRACT

Libraries and information centers are changing their practices since past few years due to increased use of applications of information communication and technology. Massive use of technologies, internet and web 2.0 technology assisted library professionals to collect the required information and provide different library and information services effectively, efficiently and economically. Though different information resources are available on the net, however there is a need to find and assess the methods of searching information from resources available over the net. Many search engines are available which helps users in collecting the information available in various sectors. This information is very useful but every search engine has its own way of covering the information and concentration over a particular area. Librarian as a service provider could search these resources and find its utility in terms of providing better services to users with the help of internet and web resources using search engines.

Use of web search engines is more prominent in collecting the information over the net. Google is the most popular search engine among all the search engines and used commonly by everyone. Searching information on the net is a skill and selection of proper search engine is also a necessary skill required for the searcher. Though search engines are used to gather information, but precision and recall of every search engine is an important factor while selecting search engines. Search engines, Meta search engines and subject portals play an important role, but its detailed analysis and evaluation is necessary to make better use in gathering information. Hence there is a need to evaluate the available search engines for the librarians and record those search engines useful for providing subject information and useful to librarians considering aspects like coverage, utility, currency, precision and recall etc.

World Wide Web is one of the valuable information resources for getting full text of documents and can be searched using web search engines more effectively. Using search engines it is possible to make available and obtain information from the Internet. Search engines are the mechanisms that aid users to search the entire Internet for relevant information. Search Engines automatically process to update information, modify and maintain the resources available on web sites and web pages. They index all the information floating on the net; categorize information into various heads and then present for searching by the users based on search terms. They provide key word searching, based on the indexing of text contained within a document and deliver a list of WWW link (URL's) that contain the key word entered in the search statement.

Keeping in mind that in the changed environment and use of Internet which is a source of information to all, but internet searching require proper skills and evaluation of search engines based on different criteria, and isolate suitable search engines useful for librarians for assisting users in different subject areas. Hence this topic is selected, and a list of useful search engine for the LIS is prepared. Hence this topic is selected for the research study

The overall aim of the study is to collect the information of different search engines and list them properly, analyze search engines for better use in library, nature of information covered and its utility for librarians. After thoroughly reviewing the literature, this study was conducted to highlight the importance of search engines and its usefulness to libraries. The objectives set for this study are: To study use of Internet, search engines and related technologies, To list and evaluate the search engines, To study search engines and assess most exhaustive and more relevant search results as compared to other search engines, To study search engine which are useful to use in LIS discipline, Suggest Best Practices in using search engines for LIS and present a design for developing subject portal to link useful library search engines.

The researcher of this study is trying to evaluate the searching capabilities and performance of selected Web search engines and presenting in this work.

For this research study multiple methods are used: The research method used is descriptive research in which literary/ secondary analysis technique is useful for gathering the data related to search engines. After compiling list of search engines, evaluation and analytical techniques are applied to find the usefulness of search engines for libraries. Finally based on the theoretical grounds a model is presented for practical utility of subject or library portal to link different search engines for achieving effective and comprehensive searching.

The complete study is covered in seven chapters. Chapter - 1 : Introduction and in this chapter deals with general overview of the use of ICT in LIS and its benefits, and research design in details which contains reason to select the problem, statement of the problem, aim and objectives of the study, scope and limitations and research method selected for this study. Chapter - 2 : Literature Review and presents the analysis of literature collected form different information resources and used in the completion of the study. The literature search is divided in to facets and presented under each the analysis of literature searched. Chapter - 3 : Search Engines and other Resources deals with complete study of internet based information search using search engines, working of search engines, types, benefits and meta-search engines, web resources etc in brief. Chapter - 4 : Search Engines : Comparison covers the comparison of different search engines and an effective list of its use in Library is presented in brief. Different search engines based on functions, subjects, coverage, area etc are listed in different heads. Chapter - 5 : Search Engines: Used in Library and Information Centers detailed out the prominent web pages used in Libraries to provide different services to users and use of search engines which are is very effective.

This chapter highlights the best use of search engines in providing library services and uses in different activities of LIC. A fair list of search engines useful for libraries and librarians is also presented suitably. Chapter - 6 : Access to Search Engines through Library Portal in which practical

approach towards development of library portal and providing access to search engines through library portal is discussed in this chapter. Search engines useful for libraries are recorded in this chapter. Chapter -7 : Suggestions and Conclusion list out and highlights few suitable suggestions for information searching using information resources available over the net and accessed using search engines and concludes the study with providing scope for further research.

This study might be useful for library and information professionals in making best use of search engines for data collection and disseminating information through different library services to users. Similar studies may be useful for users in different sectors also.

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ABBREVIATIONS

AIFF	:	Audio Interchange File Format
ALT	:	Alternate Key (Alt Key on key board)
ARC	:	Archival Research Catalog
ARPANet	:	Research Projects Agency Network
ASP	:	Application Service Provider
BASE	:	Bielefeld Academic Search Engine
BI	:	Business Intelligence
CERN	:	European organization for Nuclear Research
CIA	:	Central Intelligence Agency
CMGI	:	Computer Modeling Group Ltd.
CNA	:	Currency Not Available
CREDO	:	Conceptual Reorganization of Documents
CSULA	:	California State University, Los Angeles
CTRL	:	Control Key (on key board)
DEL	:	Delete (on key board)
DLC	:	Digital Library of the Commons
DOAJ	:	Directory of Open Access Journals
DR	:	Distant Relevant
EBI	:	European Bioinformatics Institute
EBSCO	:	Elton Bryson Stephens Company information service
ECM	:	Enterprise Content Management

EMBL	:	European Molecular Biology Laboratory
ERIC	:	Education Resources Information Center
ESP	:	Enterprise Search Platform
FAST	:	Fast And Secure Transfers
FFO	:	First Five Output
FTP	:	File Transfer Protocol
FTS	:	Full Text Search
GO	:	GeneOntology
GUI	:	Graphical Users Interface
HTML	:	HyperText Markup Language
ICT	:	Information Communication and Technology
IDF	:	Inverse Document Frequency
IDOL	:	Intelligent Data Operating Layer
IES	:	Institute of Education Sciences
ILL	:	Inter Library Loan
IP	:	Internet Protocol
IPL	:	Internet Public Library
IR	:	Irrelevant
IT	:	Information Technology
IWON	:	Free Casual Game Site
KMLE	:	King's Medical Library Engine
LFO	:	Last Five Output

LII	:	Librarians' Internet Index
LIS	:	Library and Information Science
MARC	:	Machine Readable Catalogue
MP3	:	Audio Coding Format
MSS	:	Microsoft Search Server
NARA	:	National Archives and Records Administration
NSDL	:	National Science Digital Library
NTT	:	Nippon Telegraph and Telephone Public Corporation
OCLC	:	Online Computer Library Center
ODP	:	Open Directory Project
OPAC	:	Online Public Access Catalog
PDA	:	Personal Digital Assistant
PDF	:	Portable Document Format
PNF	:	Page Not Found
PR	:	Partially Relevant
R	:	Relevant
RBSE	:	Repository-Based Software Engineering
RSS	:	Rich Site Summary
SAP	:	Systems, Applications & Products in Data Processing
SDK	:	Software Development Kit
SE	:	Search Engine
SEO	:	Search Engine Optimization

SERP	:	Search Engine Results Page
SGML	:	Standardized Generalised Mark-up Language
SMART	:	Self-Monitoring, Analysis, and Reporting Technology
SQL	:	Structured Query Language
SRU	:	Search Retrieval vai Url (protocol)
STEM	:	Science, Technology Engineering and Mathematics
SWISH-E	:	Simple Web Indexing System for Humans – Enhanced
TCP/IP	:	Transmission Control Protocol / Internet Protocol
TF	:	Term Frequency
UNPO	:	Unrepresented Nations and Peoples Organization
URL	:	Uniform Resource locator
VLib	:	Virtual Library
WAV	:	Waveform Audio File Format
W3C	:	World Wide Web Consortium
WLA	:	Windows Live Academic
WOW	:	World of Warcraft
WWW	:	World Wide Web
XML	:	Extensible Markup Language

CHAPTER-I

INTRODUCTION

CHAPTER-I

INTRODUCTION

1.1 INTRODUCTION:

Libraries and information centers are changing their practices since past few years due to increased use of applications of information communication and technology. Use of ICT is now very common and has reached to the grass root level in all fields including Libraries. Massive use of technologies, internet and web 2.0 technology assisted library professionals to collect the required information and provide different library and information services effectively, efficiently and economically. Though different information resources are available on the net, however there is a need to find and assess the methods of searching information from resources available over the net. Many search engines are available which helps users in collecting the information available in various sectors. This information is very useful but every search engine has its own way of covering the information and concentration over a particular area. Librarian as a service provider could search these resources and find its utility in terms of providing better services to users with the help of internet and web resources.

Libraries are always popular as an agency of information / knowledge holder and disseminate the information to users. Users of the libraries are mainly interested in searching the desired information. The libraries and librarians are providing the information to users. The search methods adopted by users are changing continuously. A cursory review indicates that there is a progress in searching information. Initially information was searched using reference collection / books like encyclopaedias on subjects, directories, dictionaries etc. In addition to this in 60's card catalogue, indexing and abstracting journals were used to gather the information. during 70's and 80's online and offline searching system was very popular in which databases were used to collect the information searching online or offline. In the present IT era searching information is drastically changed, along with the traditional practices internet is being heavily used for collecting information by all the users. Use of web search engines is more prominent in collecting the information over the net. Google is

the most popular search engine among all the search engines and used commonly by everyone. Searching information on the net is a skill and selection of proper search engine is also a necessary skill required for the searcher. Though search engines are used to gather information, but precision and recall, of every search engine is an important factor while selecting search engines. Search engines, meta search engines and subject portals play an important role, but its detailed analysis and evaluation is necessary to make better use in gathering information. Hence there is a need to evaluate the available search engines for the librarians and record those search engines useful for providing subject information and useful to librarians considering aspects like coverage, utility, currency, precision and recall etc.

1.2 BACKGROUND:

The World Wide Web (WWW), has rapidly gained popularity and become the second most widely used application of the Internet. The publicity of WWW has gained so much that many people equate WWW with the Internet. The freewheeling nature of publishing on the Web is a blessing for the flow of ideas. As a result, the web has become a sea of all kinds of data, making any query into the huge information reservoir extremely difficult. However, "finding information on the Web is a matter of chance and also needs skills (Tripathi 2001)".

Search engines are among the most popular tools for resource discovery on the WWW. Obviously all search engines follow different algorithms to index information on the web and for output results to a user's query. In order to be effective searcher on the web, it is important to analyse and utilize the search engines most suited to one's subject domain. With the advent of huge search engines like Google and AltaVista, containing millions of homepages, measuring the number of hits is no longer an effective measure. The question of the quality of the hits rather than their quantity is becoming more important. The freewheeling nature of publishing on the Web is a blessing for the flow of ideas, but it has also complicated the process of retrieving relevant information. In contrast to traditional IR, there are neither consistent indexing and classification principles for organizing materials on the Web, nor there are any filtering practices at hand to ensure the quality and credibility of the documents. (Tripathi 2001).

In order to overcome difficulty in retrieving information from WWW, search engines are available, but need is raised to access features of web search engines, how do they differ from one another in performance, is a single web search engine that out-performs all others in information retrieval, etc. Thus a detailed study on the usage of web search engines is of great importance to library professionals which helps in selecting search engines while searching information for libraries and their users.

Since web is used easily and becomes user-friendly for searching information as well as useful for searching information on any subject it also necessary to find desired information from the heap of information. It is also necessary to find possible information available through different search engines and also its usability in LIS. The current study attempts to seek answers in proper usage of search engines for information gathering and especially for LIS area having main objective to evaluate the performance of selected search engines to locate information from www.

1.3 SEARCH ENGINES :

World Wide Web, is one of the valuable information resources for getting full text of documents and can be searched using web search engines more effectively. Using search engines it is possible to make available and obtain information from the Internet. Search engines are the mechanisms that aids users to search the entire Internet for relevant information. Search Engines automatically process to update information, modify and maintain the resources available on web sites and web pages. They index all the information floating on the net; categorize information into various heads and then present for searching by the users based on search terms. They provide key word searching, based on the indexing of text contained within a document and deliver a list of WWW link (URL's) that contain the key word entered in the search statement.

According to Alan Poulter (1997), "A www search engine is defined as retrieval service, consisting of a database(s) describing mainly resources available on the www, search software and a user interface also available via www". All the Crawler-

based web search engines mainly consist of three major parts. The goal of SE is to find out the content and information to add to the search engine's database.

The World Wide Web has revolutionized the way the people access information, and has opened up new possibilities in areas such as digital libraries, information dissemination and retrieval, education, commerce, entertainment, government and health care. "The amount of publicly available information on the web is increasing consistently at an unbelievable rate (Lawrence and Giles 1998)". "It is a gigantic digital library, a searchable 15 billion-word encyclopaedia (Barrier and Presti 1996)". It has stimulated research and development in information retrieval and dissemination. There are specialised Search Engines for different areas like engineering, medicine, social sciences, and even for the librarians and use of libraries. A detailed study is necessary for evaluating the useful search engines especially for libraries and librarians.

1.4 REASON TO SELECT THE STUDY:

Increased use of search engines for gathering and using the information as well as emergence of different search engines for different purposes made it necessary to prepare a possible comprehensive list of search engines, evaluate them, assess the utility for the libraries based on coverage of information etc and such comparative studies may be very useful for the library professionals in providing different services economically to the users.

The review of literature indicated that in the area of search engines, many studies comparing relevance have been conducted. However, researcher have chosen this field for present study because many previous studies have arrived different conclusions and here researcher used to assess the use of search engines for providing assistance in searching information and providing library services with precision to users.

Internet is now biggest information treasure and resource for searching any kind of information. Every one depends on it and using heavily for getting information. Initially internet was providing only reading facility but due to addition of web 2.0 it

becomes read and write source. Users not only read the information available but contribute also and update the knowledge. This has increased the power of net searching. To search desired information from the ocean available through net search engines plays an important role and constantly busy in working. Different search engines are available but proper selection of search engine is necessary to achieve precision and recall in searching information and it is a skill. The search engines are grouped in to general and specialised. The librarians are and library users are also depending on the internet as it provides information to them. But librarians has to suggest users to select proper search engines to get better information. For this purpose there is a need to evaluate the available search engines useful for the librarians and academicians and record those search engines useful for providing subject information considering aspects like coverage, utility, currency, precision and recall etc. Hence in the present study efforts are made to analyse role of search engines, types, function, working, features, components, architecture and rank the search engines useful for librarians.

Search engines are among the most popular tools for resource discovery on the WWW. Obviously all search engines follow different algorithms to index information on the web and to output results to a user's query. In order to be effective on the web, it is important to utilize the search engine most suited to one's subject domain. In order to overcome difficulty in retrieving information from WWW, the current study attempts to seek answers to questions. Besides, the main objective of the current study is to evaluate the performance of selected search engines used to locate information from www in terms of the following:

- Search engine that provides most exhaustive search of www.
- Search engine provides more relevant search results as compared to other selected search engines
- Search engines supports to specific discipline
- Search engine which is provides more current results
- Search engine that provides more links

1.5 AIM OF THE STUDY:

The overall aim of the study is to collect the information of different search engines and list them properly, analyse search engines for better use in library, nature of information covered and its utility for librarians. After thoroughly reviewing the literature, this study was conducted to highlight the importance of search engines and its usefulness to libraries.

1.6 OBJECTIVES:

The main objectives of the study are as under:

1) To study use of Internet, search engines and related technologies
2) To list and evaluate the search engines
3) To study search engines and assess most exhaustive and more relevant search results as compared to other search engines
4) To study search engine which are useful to use in LIS discipline
5) Suggest Best Practices in using search engines for LIS and present a design for developing subject portal to link useful library search engines.

The researcher of this study is trying to evaluate the searching capabilities and performance of selected Web search engines and presenting in this work.

1.7 METHODOLOGY:

For this research study multiple methods are used:

1) The research method used is descriptive research in which literary/ secondary analysis technique is useful for gathering the data related to search engines. After compiling list of search engines, evaluation and analytical techniques are applied to find the usefulness of search engines for libraries.

2) Finally based on the theoretical grounds a model is presented for practical utility of subject or library portal to link different search engines for achieving effective and comprehensive searching.

1.8 SCOPE AND LIMITATION OF STUDY:

The scope is to list search engines and analyse and evaluate to find more utility in LIS. Evaluation of search engines helps in preparing a list for library usage. Analyse usefulness of search engines in providing information from it through different services to users. Prepare a model for connecting useful library search engines. The scope of the study is restricted to the web search and its role in libraries. Few search engines are studied in detail and tracked its applicability in LIC's.

The different terms used in the research study defines:

1) **Internet:** The internet in simple terms is a network of the interlinked computer networking worldwide, which is accessible to the general public. These interconnected computers work by transmitting data through a special type of packet switching which is known as the IP or the internet protocol.
2) **Web:** It is a computer programming system created by Donald E. Knuth as the first implementation of what he called "literate programming": the idea that one could create software as works of literature, by embedding source code inside descriptive text, rather than the reverse (as is common practice in most programming languages), in an order that is convenient for exposition to human readers, rather than in the order demanded by the compiler.
3) **Web Site:** To be very precise a website is described as a file. It is a file which contains a collection of different files only of the www or the World Wide Web nature. These files are uploaded on the web, which makes it a particular website with an address so that it can be accessed by everyone. The first of the files in the collection of these www files is known as the homepage.
4) **Search Engine:** a computer program that searches for particular keywords and returns a list of documents in which they were found, especially a commercial service that scans documents on the Internet

5) **Search:** to examine a computer file, disk, database, or network for particular information engine
6) **Meta Search Engine:** A metasearch engine is a search tool that sends user requests to several other search engines and/or databases and aggregates the results into a single list or displays them according to their source.
7) **Metadata:** Data about data. Metadata describes how, when, and by whom a particular set of data was collected and how the data is formatted. Meta data is essential for understanding information stored in data warehouses and has become increasingly important in web based applications
8) **Portal:** A computer interface that provides federated searching and information retrieval from diverse target resources. The portal provides federated searching and information retrieval of descriptive metadata from multiple diverse target resources.
9) **Federated Search:** This is also called as Met search or Broadcast search, a cross search, a distributed search, or a parallel search. A search that contacts multiple remote databases and returns search results through a single interface.
10) **XML:** A simplified subset of Standardized Generalised Mark-up Language (SGML) that provides a file format for representing data to create a schema for describing data and its structure. The flexibility of XML document helps in rendering in multiple formats including web page, HTML, a word document, or a PDF. An XML record is a sort of MARC record for electronic data source.
11) **Z 39.50:** The standard communication protocol for searching and retrieving bibliographic data in library catalogues and some other databases. Z 39.5 was created prior to development of WEB.

1.9 STRUCTURE OF STUDY:

The complete study is covered in seven chapters.

- **Chapter - 1 : Introduction :**
  This chapter deals with general overview of the use of ICT in LIS and its benefits, and research design in details which contains reason to select the problem, statement of the problem, aim and objectives of the study, scope and limitations and research method selected for this study.

- **Chapter - 2 : Literature Review :**
  This chapter presents the analysis of literature collected form different information resources and used in the completion of the study. The literature search is divided in to facets and presented under each the analysis of literature searched.

- **Chapter - 3 : Search Engines and other Resources :**
  This chapter deals with complete study of internet based information search using search engines, working of search engines, types, benefits and meta-search engines, web resources etc in brief

- **Chapter - 4 : Search Engines : Comparison**
  This chapter covers the comparison of different search engines and an effective list of its use in Library is presented in brief. Different search engines based on functions, subjects, coverage, area etc are listed in different heads

- **Chapter - 5 : Search Engines: Used in Library and Information Centers:**
  Libraries provide different services to users and use of search engines which are is very effective. This chapter highlights the best use of search engines in providing library services and uses in different activities of LIC. A fair list of search engines useful for libraries and librarians is also presented suitably.

- **Chapter - 6 : Access to Search Engines through Library Portal :**

A practical approach towards development of library portal and providing access to search engines through library portal is discussed in this chapter. Search engines useful for libraries are recorded in this chapter.

- **Chapter -7 : Suggestions and Conclusion :**

  This chapter highlights few suitable suggestions for information searching using information resources available over the net and accessed using search engines and concludes the study with providing scope for further research.

- **Bibliography :**

  A complete list of references cited in the total study is presented in alphabetical order.

- **Utility of study:**

  This study might be useful for library and information professionals in making best use of search engines for data collection and disseminating information through different library services to users. Similar studies may be useful for users in different sectors also.

Conclusion:

Search engines are important because over eight billion web pages available, it would be impossible to search for the information that is specifically needed. This is why search engines are used to filter the information that is on the internet and transform it in to results that each individual can easily access and use within the matter of seconds. The search engines are plenty and its use is a skilled task and need to study in deep.

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CHAPTER-II

LITERATURE REVIEW

CHAPTER-II

LITERATURE REVIEW

2.1 WHY LITERATURE SEARCH?

A literature search is a well thought out and organized search for all of the literature published on a topic. A well-structured literature search is the most effective and efficient way to locate sound evidence on the subject you are researching. Evidence may be found in books, journals, government documents and the internet. (Harvard, 2007). The review of the literature is a broad, comprehensive, in-depth, systematic, and critical review of scholarly publications, unpublished scholarly print materials, audiovisual materials, and personal communications etc. The review of the literature is traditionally considered a systematic and critical review of the most important published scholarly literature on a particular topic. Literature review acts as a guiding path in research study. It reveals the concepts and ideas and helps in avoiding duplication of work. Literature review acts as a supporting evidence to the facts deduced from the study. The purpose of literature review is to broaden the knowledge on a research topic and search relevant and related literature. The different traditional sources like primary and secondary literature is being consulted by the researcher to find out the desired information, but now new sources in digital era are consulted more like internet, online journals, websites, search engines like Google Scholar etc. Literature review helps in determines an appropriate research design/method (instruments, data collection and analysis methods) for answering the research question.

In the present study secondary and primary resources were consulted along with internet resources like journals, thesis, technical reports published in library science and in the area of WWW, Conference proceedings, books and reference resources like encyclopaedias, electronic resources available on the web like Google scholar, databases like: Emerald, EBSCO, Science Direct and Library and Information Science journals like Library Philosophy and Practice etc. Thesis databases like Shodhganga, Vidyanidhi, Australian Thesis, University Microfilms have been consulted. The

information collected from these resources has been searched and organized in different facets. The facets are:

1) Trends in Library and Information Science
2) Search Engines
3) Portals
4) Use of search engines for libraries

2.1.1. Trends in Library and Information Science:

Singh (2003) in his communication discussed the role of library automation in academic libraries in India. Author traces the developments and trends in LIS and indicated that library automation is necessary and many libraries have completed it. The need of automation felt is due to information explosion, crunching budgets and resource sharing etc. Author analysed the status of automation in university libraries and also analysed challenges and problems involved in automation and suggested that library staff has to acquire skills necessary for adjusting with the trends. Automation is necessary as it takes care of all housekeeping operations and reduces the repetitive functions involved in library activities. Use of internet and intranet is also preferred by the author in his communication.

Menchaca (2008) in his article considered the challenges and opportunities publishers and libraries face in redefining themselves in the digital age. Migrating resources from print to electronic format represents only one aspect of this redefinition. Both entities must make their resources findable via the search engines that are increasingly the first and last stop in research by students and by faculty. Findability itself amounts to more than making library collections work seamlessly with the Internet: it also requires a more user-cantered approach to product development, design, and communication/marketing.

Carpineto et al (2009) in their article discussed the mobile information retrieval and clustering of search results. The authors indicated that Web searches from mobile devices such as PDAs and cell phones are becoming increasingly popular. However, the traditional list-based search interface paradigm does not scale well to mobile devices due to their inherent limitations. In this article, authors investigated the

application of search results clustering, used with some success for desktop computer searches, to the mobile scenario. Building on CREDO (Conceptual Reorganization of Documents), a Web clustering engine based on concept lattices, presents its mobile versions Credino and SmartCREDO, for PDAs and cell phones, respectively. The main finding is that clustering engines are a viable complementary approach to plain search engines both for desktop and mobile searches especially, but not only, for multi topic informational queries.

Dhar (2010) discussed the trends in LIS and IT era and their fast applications in libraries. The author is of the opinion that there is a need to re-engineer the libraries as well as role of librarians are more involved in the process of re-engineering of libraries.

2.1.2. Search Engines:

Maharana and Mahapatra (2006) analysed and pointed out that Google scholar is the best search engine for searching scholarly information among all the search engines available on the web. It is world's most popular search engine. It enables to help users to search scholarly literature from peer reviewed journals, thesis, books, technical reports etc. Google scholar gets information directly from the publisher and also by crawling through the web. The most advantage of this search engine is that it provides citations to the articles or documents etc. Chakrabarty and Randhwa (2006) analysed and compared the three search engines viz Google Scholar, Cirus, and WLA. They concluded that Cirus is the most popular search engine among the academic search engines followed by Google Scholar. The paper highlighted the features of these search engines.

The definition and need of the search engine discussed on the site Illinois summarises as (http://www.library.illinois.edu/ugl/howdoi/compare1.html.) a search engine, which is a service that utilizes a computer program to search the Internet and identify items that match the characters and keywords entered by a user. Examples of search engines include Google, Yahoo, and Bing. (http://www.library.illinois.edu/ugl/howdoi/compare1.html.) Search engines are useful for finding information on organizations, groups, and personal web pages

related to a topic. They can also be used for finding articles, but it can be difficult to narrow down results, find relevant material, and assess the legitimacy of information found on the Internet. It is especially important to be careful when using Internet sources, as there is are no quality control mechanisms that verify the validity of information on individual web pages.

According to Wempen Faithe (1998), beginners complain about the vastness of Internet resources. There are millions of pages all over the world, and information professionals are not going to stumble onto the information they need by just clicking on links. It is highly frustrating that there is not one comprehensive index, like in the back of the book, where they can just look things up. There is not a single master index, but there are several very good partial indexes, and in many cases LIS professionals may find more information than they need by using only one of them. That means, the partial indexes are nothing but search engines. With a search engine, LIS professionals type in what they want to search for, and the system consults an index of the web and pulls up addresses of all pages that match their search. Each search engine is a little different from others. The basic procedure for using each one is the same. However while performing advanced searches using complicated stuff, like entering complex search criteria, each search engine has its own rules. Search engines use bots or spiders that travel through the Internet, constantly checking out the sites and recording information for their masters. The bots/spiders make a note of the page's address and key words, and send it back home for inclusion in the index.

Chottopadhyay et al (2003) conducted a study on web search engines and elaborated the use of search engines in searching information. Authors concluded that each web site comprises a store of information called a database. Then the database has links to other databases at other web sites, and the other web sites have links to still other web sites. Thus, each search tool has extended search capabilities by means of a worldwide system of links. There are different types of search tools. In the search engine the different forms based user interface provides access to sophisticated searching capabilities that allow users to find references in their fields. When one of the database buttons in the above step is clicked, the basic user interface for the search engine.

Sudesh (2003) also presented a study on Search engine in CALIBER 2003 in which the author made emphasis to describe different uses and searching practices on the web. Different search steps are elaborated in the discussions as well as best practices in optimizing searches using search engines are highlighted.

Martzoukou (2008) in his communication studied the students behaviour and attitude towards web search engines and searching strategies used by them. The results of the study pointed out that more search engines are used by the age group of 29 and above, and the English is the preferred language of search. The Google is highest used search engine followed by Yahoo, Alta Vista, Lycos, and least used search are HotBot, Inforssek, Excite etc.

Janesan et al (2009) studied search engine performance and investigated the effect of search engine brand on the evaluation of searching performance. The research study is motivated by the large amount of search traffic directed to a handful of web search engines, even though many have similar interfaces and performance. Authors found brand indeed played a role in the searching process. Brand effect varied in different domains. Users seemed to place a high degree of trust in major search engine brands; however, they were more engaged in the searching process when using lesser-known search engines. It appears that branding affects overall Web search at four stages: (a) search engine selection, (b) search engine results page evaluation, (c) individual link evaluation, and (d) evaluation of the landing page. Authors discussed the implications for search engine marketing and the design of empirical studies measuring search engine performance.

Janesan et al (2007) discussed on search engines in depth and detecting query reformulations within a session by a Web searcher is an important area of research for designing more helpful searching systems and targeting content to particular users. In their article, authors explored three alternative methods for detection of session boundaries. All three methods are computationally straightforward and therefore easily implemented for detection of session changes.

Evans (2007) studied search engines and elaborated Google ranking through SEO. The purpose of the paper is to identify the most popular techniques used to rank a web

page highly in Google. Design/methodology/approach. The paper presents the results of a study into 50 highly optimized web pages that were created as part of a Search Engine Optimization competition. The study focuses on the most popular techniques that were used to rank highest in this competition, and includes an analysis on the use of PageRank, number of pages, number of in-links, domain age and the use of third party sites such as directories and social bookmarking sites. The Findings provides insight into the techniques that successful Search Engine Optimizers use to ensure a page ranks highly in Google. Recognizes the importance of PageRank and links as well as directories and social bookmarking sites.

Summary:

The search engines are many and they help in searching information in better way. Searching information using search engines is a skill and while selecting the search engine evaluation is required. The Google is highest used search engine followed by Yahoo, Alta Vista, Lycos, and least used search are HotBot, Inforssek, Excite etc. However Google Scholar, Cirus are also best search engines. Different types of search engines are available for the searchers and used by them based on the requirements and contents and coverage of the search engine.

2.1.3. Library Portal:

Jansen and Spink (2006) explained the art of searching using web search engines is acquired by users. The results of the study are based on the comparison of nine search engines. The Web and especially major Web search engines are essential tools in the quest to locate online information for many people. The research examined characteristics and changes in Web searching from nine studies of five Web search engines based in the US and Europe. Author compared interactions occurring between users and Web search engines from the perspectives of session length, query length, query complexity, and content viewed among the Web search engines. The results of research shows, (1) users are viewing fewer result pages, (2) searchers on US-based Web search engines use more query operators than searchers on European-based search engines, (3) there are statistically significant differences in the use of Boolean operators and result pages viewed, and (4) one cannot necessary apply results from studies of one particular Web search engine to another Web search engine. The wide

spread use of Web search engines, employment of simple queries, and decreased viewing of result pages may have resulted from algorithmic enhancements by Web search engine companies.

Little (2001) in his communication discussed the intellectually useful role of portals with different types and their benefits. He has predicted that in the future universities will upgrade their web services by building portals. Portals in future might act as proactive, user centered, service oriented model.

Konnur and Kachergi ( ) Discussed the role of librarian in building the Library Portal in their communication. Significance, elements, and functionality of library portals is discussed very well. The authors integrated library resources and local databases in the library portals for the users.

2.1.4. Use of Search Engines for Libraries:

Batthini and Madani (2003) conducted a detailed study on web search behaviour of LIS professionals and found that satisfaction level of the LIS Professionals with the type of information sought through search engines is useful. Also investigated the users dependency on the search engines and the familiarity of the advanced search options available in the search engines. Balue (2007) has rightly pointed out that meta searching or federated searching is the solution to the problem of too many databases with multiple search interfaces. He also narrated the different terms like metadata, portal, Federated search, SRU, XML, Z 39.50 etc.

Bass (2011) in his article " 20 Useful Specialty Search Engines for College Students" listed out the prominent search engines useful to college and graduate students. Author has isolated search engines for academic sector. Among 20 search engines Google Scholar, Academic Index, Base, Citeseerx, Infomine, ipl2, iseek, valdo, DOAJ, ERIC, Intute, Open Library, worldcat, Archive Hub, Library of Congress are the major useful search engines for academics.

Yu and Young (2004) advocated The Impact of Web Search Engines on Subject Searching in OPAC. They Analyzes results of transaction logs at California State

University, Los Angeles (CSULA) and Studies. The authors find that user success in subject searching remains problematic. a major increase in the frequency of searches that would have been more successful in resources other than the library catalogue is noted over the time period 2000-2002. The authors attribute this increase to the prevalence of web search engines and suggest that meta searching, relevance-ranked results, and relevance feedback ("more like this") are now expected in user searching and should be integrated into online catalogues as search options.

Dirk (2008) analysed in his study the retrieval effectiveness of web search engines: considering results descriptions. The purpose of this paper is to compare five major web search engines (Google, Yahoo, MSN, Ask.com, and Seekport) for their retrieval effectiveness, taking into account not only the results, but also the results descriptions. Author reported that the two major search engines, Google and Yahoo, perform best, and there are no significant differences between them. Google delivers significantly more relevant result descriptions than any other search engine. This could be one reason for users perceiving this engine as superior. The author implies that search engines should focus on relevant descriptions. Searchers are advised to use other search engines in addition to Google.

Spink et al (2006) discussed uniqueness of search engines and indicated that performance and capabilities of Web search engines is an important and significant area of research. Millions of people worldwide use Web search engines very day. A major study examining the overlap among results retrieved by multiple Web search engines for a large set of more than 10,000 queries are analysed by the authors. The study was to conduct a large-scale study to measure the overlap of search results on the first result page (both non-sponsored and sponsored) across the four most popular Web search engines, at specific points in time using a large number of queries. The Web search engines included in the study were MSN Search, Google, Yahoo! and Ask Jeeves. The study made is compared with results with the first page results retrieved for the same queries by the metasearch engine Dogpile.com. Two sets of randomly selected user-entered queries, one set was 10,316 queries and the other 12,570 queries, from Infospace's Dogpile.com search engine (the first set was from Dogpile, the second was from across the Infospace Network of search properties were submitted to the four single Web search engines). The authors recorded that the

percent of total results unique to only one of the four Web search engines was 84.9%, shared by two of the three Web search engines was 11.4%, shared by three of the Web search engines was 2.6%, and shared by all four Web search engines was 1.1%. This small degree of overlap shows the significant difference in the way major Web search engines retrieve and rank results in response to given queries. Results point to the value of metasearch engines in Web retrieval to overcome the biases of individual search engines.

Basset and Kumaran (2007) studied Google Co-Op search engine, which Google has recently introduced Google Co-op, a platform which is comprised of three different tools: custom search engine, subscribed links, and topics. The custom search engine and subscribed links features of Google Co-op are being used successfully by a variety of different businesses and libraries to help harness the power and size of the Web.. By examining the ways that such organizations are using Google Co-op and by demonstrating how to use custom search engines and topics, the article draws some conclusions about the potential usefulness of Google Co-op's features for libraries.

Kay and Renee (2009) discussed the issues regarding search engine optimization and detailed analysis of Google search engine in their communication. Search engine optimization, or the practice of designing a web site so that it rises to the top of the results page when users search for particular keywords or phrases, has become so prevalent on the modern web that it has a significant influence on Google search results. The article examines the techniques used by search engine optimization practitioners, the difference between “white hat” and “black hat” optimization tactics, and why it is important for library staff to understand these techniques and their impact on search engine results pages. It also looks at ways that library staff can help their users and develop awareness of the factors that influence search results and how to better assess the quality and relevance of results listings.

Ford and Lisa (2007) studied the Google Scholar, Scirus, and Windows Live for Academic Searches and found the functionality and coverage of each engine and compared them. The results noted by the author pointed out, Google Scholar retrieved the most citations, followed by Scirus, and then by Microsoft's engine.

Author suggested that Libraries should link to these engines and enable OpenURL and other link resolving systems to ease retrieval for their users.

Dirk (2008) studied the user behaviour while using the search engines and guided for the effective searching on the net. He explained that the typical behaviour of the Web search engine user is widely known: a user only types in one or a few keywords and expects the search engine to produce relevant results in an instant. Since search engines are trendsetters for the whole information world, it is important to know how they cope with their users' behaviour. Recent developments show that search engines try to integrate results from different collections into their results lists and to guide their users to the right results. These results should not only be relevant in general, but also be pertinent in the sense of being relevant to the user in his current situation and in accordance to his background. The article focuses on the problems of guiding the user from initial query to results. It shows how the general users are searching and how the intents behind their queries can be used to deliver the right results. It will be shown that search engines try to give some good results for everyone instead of focusing on complete result sets for a specific user type. If the user wishes, he can follow the paths laid out by the engines to narrow the results to a result set suitable for him.

Jain and Saraf (2006) discussed on the issues of use of Google search engine in their communication and opined that internet search engines are tools to retrieve the information from web. Among all Google is most popular search engine among all the users especially academic users in getting information.

Jain and Saraf (2006) in their research communication discussed the benefits of Google search engine useful in libraries and to the librarians. Authors are of the opinion that Internet / web search engines are the tools to retrieve information from web and highlighted the utility of Google, Google scholar, Google, books, Google library etc.

Summary:

Different scholars in their studies reported the uniqueness of the search engines and its selection criteria. The evaluation criteria and opinions of the users placed ranking use of search engines.

From the literature search researcher arrived on the conclusion that a study is essential on the search engines and its utility in LIS profession. This study is a unique and not reflected while searching the different sources though many similar studies are reported.

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CHAPTER-III

SEARCH ENGINES AND OTHER WEB RESOURCES

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3.1 INTRODUCTION:

In the era of ICT and Internet the resources are available on the different sites or web pages having specified URL's. These pages can be searched using search engines. Search engines helps users in identifying the pages on the net which can be requested and downloaded by the searcher. There are many search engines having specific activities to perform and support for information gathering. Now a day's internet has emerged as the most powerful medium for storage and retrieval of information. It works round the clock and connects every nook and corner of the globe. Ali (2001) rightly indicated about the internet is that "With an unprecedented growth in the quantum of knowledge worldwide and the easy accessibility, internet has become an unavoidable necessity for every institution of higher learning and research". Internet is collection of millions of computers interconnected through the worldwide telecommunication system. All the computers are able to share information with each other because they use common communication protocols like TCP/IP. Such internet protocols allow different networks form local area networks to wide area networks to be interconnected for information communication and its exchange. Internet is a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computers without restrictions of geographical locations.

3.2 WHAT IS A SEARCH ENGINE?

A search engine is a service that utilizes computer program to search the internet and identify items that match the characters and keywords entered by a user. Examples of search engines include Google, Yahoo, Bing and many more. (http://www.library.illinois.edu/ugl/howdoi/compare1.html)

A search engine is a wonderful tool found over the internet. It uses the boolean technique to combine terms and provide relevant results, with links to searcher

instantly. . Search engines are nothing but programs that helps in searching documents for specified keywords and returns a list of the documents where the keywords were found with its location. Concise Encyclopaedia defined the term as "Tool for finding information, especially on the internet or WWW. Search engines are essentially massive databases that cover wide swaths of the Internet. Most consist of three parts: at least one program, called a spider, crawler, or bot, which “crawls” through the Internet gathering information; a database, which stores the gathered information; and a search tool, with which users search through the database by typing in keywords describing the information desired (usually at a Web site dedicated to the search engine). Increasingly, metasearch engines, which search a subset (usually 10 or so) of the huge number of search engines and then compile and index the results, are being used".

The search engines have three parts which performs unique functions and support to information searching based on keyword search.

- A spider (also called a "crawler" or a "bot") that goes to every page or representative pages on every Web site that wants to be searchable and reads it, using hypertext links on each page to discover and read a site's other pages
- A program that creates a huge index (sometimes called a "catalog") from the pages that have been read
- A program that receives your search request, compares it to the entries in the index, and returns results to searcher.

There are many search engines available on the net and user has to evaluate and select for searching information.

3.3 WHY USE SEARCH ENGINES?

Search engines are useful for finding information on organizations, groups, and personal web pages related to a topic. They can also be used for finding articles, but it can be difficult to narrow down results, find relevant material, and assess the legitimacy of information found on the Internet. It is especially important to be wary

when using Internet sources, as there is are no quality control mechanisms that verify the validity of information on individual web pages. (http://www.library.illinois.edu/ugl/howdoi/compare1.html). Before studying search engines Internet organisation is an important aspect to study. A brief information is briefed in the following paragraph.

3.4 ORGANISATION OF THE INTERNET:

To understand the nature of working of search engines, it need to study about the Internet or the web also. It is the network of hypertext links that connect pages. The term hypertext derives from the Greek words for "text-over-text". It is essentially non-linear, although it can allow user to create a multiplicity of linear trails. The information may be accessed by alternative paths. The most flexibility in hypertext structure is facility for an object-oriented design, which also invokes facilities for audio and video applications including Java applets. Just by clicking on the hypertext button, the user can play sound or video clips or jump to a text window. The entire knowledge domain is open to user and necessary links between ideas can be made easily. This is accomplished by creating hyperlinks, between information. These links are provided so that readers or users may "jump" from one bit of information to further information about a specific topic.

3.5 SEARCH ENGINES - BASICS:

Search engines are programs that search documents for specified keywords and returns a list of the documents where the keywords were found. A search engine is really a general class of programs, often used to specifically describe systems like Google, Bing and Yahoo Search that enable users to search for documents on the World Wide Web. Typically, Web search engines work by sending out a spider to fetch as many documents as possible. Another program, called an indexer, reads these documents and creates an index based on the words contained in each document. Each search engine uses a proprietary algorithm to create its indices so that, ideally, only meaningful results are returned for each query.

A web search engine is a software system that is designed to search information available on the World Wide Web (WWW). The search results are generally presented in a line of results often referred to as search engine results pages (SERPs). The information displayed may be a specialist in web pages, images, information and other types of files. Some search engines also mine data available in databases or open directories. Unlike web directories, which are maintained only by human editors, search engines also maintain real-time information by running an algorithm on a web crawler.

Thus in short a software package for searching particular information or specific topic, in an enormous body of information available on the Internet, is called a search engine. It can also be used to refer to a tool for searching in a locally fixed body of information (intranet, or a database). A search engine thus behaves like a reference librarian who helps user to find information sources. The most common search engines are Google, Lycos, Yahoo, Webcrawler, Altavista, Aliweb, Infoseek etc. Software, such as Netscape, Internet Explorer, etc., which are used to browse items or bits of data or news on the internet, are programs that either call on specific search engines or use similar technology to search for the presence of specified terms on the net. This is commonly referred to as 'navigating' the net. Some sites on the net do nothing but help user to find additional information. These sites contain software such as search engines.

3.6. SEARCH ENGINES: HISTORY:

3.6.1 Primitive Search Engine or Browser:

The concept of hypertext and a memory extension came to life in July of 1945, and similarly Vannevar Bush's "As We May Think" was published in The Atlantic Monthly. He urged scientists to work together to help build a body of knowledge for all mankind (http://www.searchenginehistory.com/). Bush also pointed out that specialization is increasingly and also necessary for progress, and the effort to bridge between disciplines is correspondingly superficial. Science, must be continuously extended, it must be stored, and above all it must be consulted. He was not only firm believer in storing data, but he also believed that if the data source was to be useful to

the human mind, should have it represent how the mind works to the best of our abilities. He then proposed the idea of a virtually limitless, fast, reliable, extensible, associative memory storage and retrieval system. He named this device as a Memex (http://www.searchenginehistory.com/). The development narrated in respect of web at http://www.searchenginehistory.com/ is presented in brief below.

Gerard Salton (1960s - 1990s):

Gerard Salton, was the father of modern search technology. His teams at Harvard and Cornell developed the SMART informational retrieval system. Salton's Magic Automatic Retriever of Text included important concepts like the vector space model, Inverse Document Frequency (IDF), Term Frequency (TF), term discrimination values, and relevancy feedback mechanisms. He published a book called "A Theory of Indexing" which does a great job explaining many of his tests upon which search is still largely based.

Ted Nelson:

Ted Nelson created Project "Xanadu" in 1960 and coined the term hypertext in 1963. His goal was to create a computer network with a simple user interface that solved many social problems like attribution. Much of the inspiration to create the WWW was drawn from Ted's work. Later Advanced Research Projects Agency Network (ARPANet) which eventually led to the development of internet. Internet was useful and provided different services to users like:

Archie (1990):

The first few hundred web sites began in 1993 and most of them were at colleges, but long before most of them existed came Archie. The first search engine created was Archie, created in 1990 by Alan Emtage, a student at McGill University in Montreal. The original intent of the name was "archives," but it was shortened to Archie. Archie helped solve this data scatter problem by combining a script-based data gatherer with a regular expression matcher for retrieving file names matching a user query. Essentially Archie became a database of web filenames which it would match with the users queries.

Veronica & Jughead:

Archie received popularity and prompted the University of Nevada System Computing Services group to develop Veronica. Veronica served the same purpose as Archie, but it worked on plain text files. Soon another user interface name Jughead appeared with the same purpose as Veronica, both of these were used for files sent via Gopher, which was created as an Archie alternative by Mark McCahill at the University of Minnesota in 1991.

File Transfer Protocol:

Tim Burners-Lee existed at this point, however, there was no World Wide Web. The main way people shared data back then was via File Transfer Protocol (FTP). If a file wanted to be shared would set up an FTP server and if someone is interested in retrieving the data they could use an FTP client. This process worked effectively in small groups, but the data became as much fragmented as it was collected.

Tim Berners-Lee & the WWW (1991):

While an independent contractor at CERN from June to December 1980, Berners-Lee proposed a project based on the concept of hypertext, to facilitate sharing and updating information among researchers. With help from Robert Cailliau built a prototype system named Enquire. In 1989, CERN was the largest Internet node in Europe, and Berners-Lee saw an opportunity to join hypertext with the Internet. He used to create the World Wide Web, for which he designed and built the first web browser and editor (called World Wide Web and developed on NeXTSTEP) and the first Web server called http (short for HyperText Transfer Protocol daemon). The first Web site built was at http://info.cern.ch/ and was first put online on August 6, 1991. It provided an explanation about what the World Wide Web was, and how one could own a browser and how to set up a Web server. It was also the world's first Web directory, since Berners-Lee maintained a list of other Web sites apart from his own. In 1994, Berners-Lee founded the World Wide Web Consortium (W3C) at the Massachusetts Institute of Technology. Tim also created the Virtual Library, which is the oldest catalogue of the web. Tim also wrote a book about creating the web, titled "Weaving the Web".

In the early days of web exploration, the medium was bulky and difficult to use. It was not that the hyperlink concept was deficient or that http did not do this job but a

user, in order to find a resource, had to keep moving through hyperlinks, without any central organisation to lead to destination. Lynx was one of the first web browsers. It was originally developed by Lou Montulli, Michael Grobe and Charles Rexae of Distributed Computing Support Group in Academic Computing Services Department at the University of Kansas. To access a particular URL, the software developed by a team at the University of Minnesota, a revolutionary development on Internet, first appeared in late 1991. It was the first widely available, easy- to-use, client application for finding applications on internet server, called gopher. With gopher, users could search for information from all over the world with just a few keystrokes. At that time, for file transfer the FTP command had to be used as it is used today, and there was no provision for cut and paste of information as we have today in the graphical users interface or GUI, made famous by Windows. Each of the major search engines differs from the others in its approach to provide services to its users. Still indexing is performed, with retrieval based on particular categories. (Chattopadhyay et al 2003)

Primitive Web Search:

By December of 1993, three full fledged search engines had surfaced on the web: JumpStation, the World Wide Web Worm, and the Repository-Based Software Engineering (RBSE) spider. JumpStation gathered information about the title and header from Web pages and retrieved these using a simple linear search. As the web grew, JumpStation slowed to a stop. The WWW Worm indexed titles and URL's. The problem with JumpStation and the World Wide Web Worm is that they listed results in the order that they found them, and provided no discrimination. The RSBE spider did implement a ranking system.

3.3.2 Advanced Developments:

During early development of the web, there was a list of web servers edited by Tim Berners-Lee and hosted on the CERN webserver. The very first tool used for searching on the Internet was Archie. (Search Engine Watch 2001). The name stands for "archive" without the "v". It was created in 1990 by Alan Emtage, Bill Heelan and J. Peter Deutsch, computer science students at McGill University in Montreal. The program downloaded the directory listings of all the files located on public anonymous FTP (File Transfer Protocol) sites, creating a searchable database of file

names; however, Archie did not index the contents of these sites since the amount of data was so limited it could be readily searched manually.

The rise of Gopher which was created in 1991 by Mark McCahill at the University of Minnesota, led to two new search programs, viz. Veronica and Jughead. Like Archie, they searched the file names and titles stored in Gopher index systems. Veronica (*V*ery *E*asy *R*odent-*O*riented *N*et-wide *I*ndex to *C*omputerized *A*rchives) provided a keyword search of most Gopher menu titles in the entire Gopher listings. Jughead (*J*onzy's *U*niversal *G*opher *H*ierarchy *E*xcavation *A*nd *D*isplay) was a tool for obtaining menu information from specific Gopher servers.

In the summer of 1993, no search engine existed for the web, though numerous specialized catalogues were maintained by hand. Oscar Nierstrasz at the University of Geneva wrote a series of Perl scripts that periodically mirrored these pages and rewrote them into a standard format. This formed the basis for W3Catalog, the web's first primitive search engine, released on September 2, 1993.(http://en.wikipedia.org/wiki/Web_search_engine) In June 1993, Matthew Gray, then at MIT, produced what was probably the first web robot, the Perl-based World Wide Web Wanderer, and used it to generate an index called 'Wandex'. The purpose of the Wanderer was to measure the size of the World Wide Web, which it did until late 1995. The web's second search engine Aliweb appeared in November 1993. Aliweb did not use a web robot, but instead depended on being notified by website administrators of the existence at each site of an index file in a particular format. JumpStation (created in December 1993, by Jonathon Fletcher, used a web robot to find web pages and to build its index, and used a web form as the interface to its query program. It was thus the first WWW resource-discovery tool to combine the three essential features of a web search engine(crawling, indexing, and searching) as described below. Because of the limited resources available on the platform it ran on, its indexing and hence searching were limited to the titles and headings found in the web pages the crawler encountered.

One of the first "all text" crawler-based search engines was WebCrawler, which came out in 1994. Unlike its predecessors, it allowed users to search for any word in any webpage, which has become the standard for all major search engines since. It was

also the first one widely known by the public. Also in 1994, Lycos (which started at Carnegie Mellon University) was launched and became a major commercial endeavour. Soon after, many search engines appeared included Magellan, Excite, Infoseek, Inktomi, Northern Light, and AltaVista. Yahoo was among the most popular ways for people to find web pages of interest, but its search function operated on its web directory, rather than its full-text copies of web pages. Information seekers could also browse the directory instead of doing a keyword-based search.

Google adopted the idea of selling search terms in 1998, from a small search engine company named *goto.com*. This move had a significant effect on the Search Engine business, which went from struggling to one of the most profitable businesses in the internet.(http://en.wikipedia.org/wiki/Web_search_engine) In 1996, Netscape was looking to give a single search engine an exclusive deal as the featured search engine on Netscape's web browser. There was so much interest that instead Netscape struck deals with five of the major search engines and each search engine would be in rotation on the Netscape search engine page. The five engines were Yahoo, Magellan, Lycos, Infoseek, and Excite.(http://en.wikipedia.org/wiki/Web_search_engine). Search engines were also known as some of the brightest stars in the internet investing frenzy that occurred in the late 1990s. Many search engine companies were caught up in the dot-com bubble, a speculation-driven market boom that peaked in 1999 and ended in 2001.

Around 2000, Google's search engine rose to prominence. The company achieved better results for many searches with an innovation called PageRank. This iterative algorithm ranks web pages based on the number and PageRank of other web sites and pages that link there, on the premise that good or desirable pages are linked to more than others. Google also maintained a minimalist interface to its search engine. In contrast, many of its competitors embedded a search engine in a web portal. In fact, Google search engine became so popular that spoof engines emerged such as Mystery Seeker.

By 2000, Yahoo was providing search services based on Inktomi's search engine. Yahoo acquired Inktomi in 2002, and Overture (which owned AlltheWeb and AltaVista) in 2003. Yahoo switched to Google's search engine until 2004, when it

launched its own search engine based on the combined technologies of its acquisitions. Microsoft first launched MSN Search in the fall of 1998 using search results from Inktomi. In early 1999 the site began to display listings from Looksmart, blended with results from Inktomi. For a short time in 1999, MSN Search used results from AltaVista were instead. In 2004, Microsoft began a transition to its own search technology, powered by its own web crawler (called msnbot).

Microsoft's rebranded search engine, Bing, was launched on June 1, 2009. On July 29, 2009, Yahoo and Microsoft finalized a deal in which Yahoo Search would be powered by Microsoft Bing technology. In 2012, following the April 24 release of Google Drive, Google released the Beta version of Open Drive (available as a Chrome app) to enable the search of files in the cloud . Open Drive has now been rebranded as Cloud Kite. Cloud Kite is advertised as a "collective encyclopaedia project based on Google Drive public files and on the crowd sharing, crowd sourcing and crowd-solving principles". Cloud Kite also return search results from other cloud storage content services including Dropbox, SkyDrive, Evernote and Box. (http://en.wikipedia.org/wiki/Open_Drive)
(http://en.wikipedia.org/wiki/Web_search_engine)

3.3.3 Search Engines - Parts:

Search engines consist of Three main parts. Search engine **spiders** follow links on the web to request pages that are either not yet indexed or have been updated since they were last indexed. These pages are crawled and are added to the search engine **index** (also known as the catalogue). When searched using a major search engine users are not actually searching the web, but are searching a slightly outdated index of content which roughly represents the content of the web. The third part of a search engine is the **search interface and relevancy software**. For each search query search engines typically do most or all of the following.

3.3.4 What is a Bot?

Computer robots are simply programs that automate repetitive tasks at speeds impossible for humans to reproduce. The term bot on the internet is usually used to describe anything that interfaces with the user or that collects data. Search engines use "spiders" which search (or spider) the web for information. They are software

programs which request pages much like regular browsers performs. In addition to reading the contents of pages for indexing spiders also record links.

3.7 SEARCH ENGINES: WORKING PROCESS:

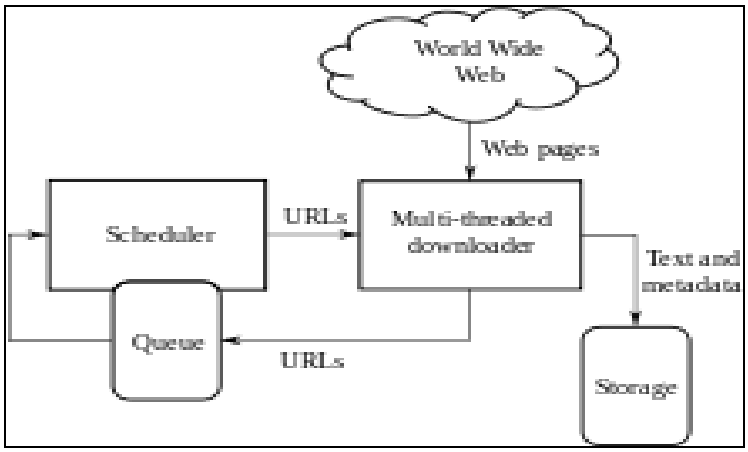
A search engine operates in the following order:

1) Web crawling
2) Indexing
3) Searching

Web search engines work by storing information about many web pages, which they retrieve from the HTML mark-up of the pages. These pages are retrieved by a Web crawler (sometimes also known as a spider) — an automated Web crawler which follows every link on the site. The site owner can exclude specific pages by using robots.txt.

The search engine then analyzes the contents of each page to determine how it should be indexed (for example, words can be extracted from the titles, page content, headings, or special fields called meta tags). Data about web pages are stored in an index database for use in later queries. A query from a user can be a single word. The index helps to find information relating to the query as quickly as possible(http://en.wikipedia.org/wiki/Web_search_engine). Some search engines, such as Google, store all or part of the source page (referred to as a cache) as well as information about the web pages, whereas others, such as AltaVista, store every word of every page they find. This cached page always holds the actual search text since it is the one that was actually indexed, so it can be very useful when the content of the current page has been updated and the search terms are no longer in it. This problem might be considered a mild form of linkrot, and Google's handling of it increases usability by satisfying user expectations that the search terms will be on the returned webpage. This satisfies the principle of least astonishment, since the user normally expects that the search terms will be on the returned pages. Increased search relevance makes these cached pages very useful as they may contain data that may no longer be available elsewhere.

Fig 3. 1 Aarchitecture of a standard Web crawler



(Source http://en.wikipedia.org/wiki/Web_search_engine)

When a user enters a query into a search engine (typically by using keywords), the engine examines its index and provides a listing of best-matching web pages according to its criteria, usually with a short summary containing the document's title and sometimes parts of the text. The index is built from the information stored with the data and the method by which the information is indexed. From 2007 the Google.com search engine has allowed one to search by date by clicking 'Show search tools' in the leftmost column of the initial search results page, and then selecting the desired date range. Most search engines support the use of the boolean operators AND, OR and NOT to further specify the search query. Boolean operators are for literal searches that allow the user to refine and extend the terms of the search. The engine looks for the words or phrases exactly as entered. Some search engines provide an advanced feature called proximity search, which allows users to define the distance between keywords. There is also concept-based searching where the research involves using statistical analysis on pages containing the words or phrases you search for. As well, natural language queries allow the user to type a question in the same form one would ask it to a human. A site like this would be ask.com. (Jawdekar 2011)

The usefulness of a search engine depends on the relevance of the result set it gives back. While there may be millions of web pages that include a particular word or phrase, some pages may be more relevant, popular, or authoritative than others. Most search engines employ methods to rank the results to provide the "best" results first. How a search engine decides which pages are the best matches, and what order the results should be shown in, varies widely from one engine to another. The methods also change over time as internet usage changes and new techniques evolve. There are two main types of search engine that have evolved: one is a system of predefined and hierarchically ordered keywords that humans have programmed extensively. The other is a system that generates an "inverted index" by analyzing texts it locates. This first form relies much more heavily on the computer itself to do the bulk of the work.

Most Web search engines are commercial ventures supported by advertising revenue and thus some of them allow advertisers to have their listings ranked higher in search results for a fee. Search engines that do not accept money for their search results make money by running search related adds alongside the regular search engine results. The search engines make money every time someone clicks on one of these ads.

3.7.1 Services of Search Engine:

A search engine provides service on the Internet that enables the user to search for items of interest. Some such services are free and attempt to capture information from the whole range of material available on the net. Others are subscription-based but in return provide access to specialist publications, full-text retrieval capabilities, or other value-added services. There exists a variety of sites on the web; each site has its own address, and may allow users to jump to additional sites. Some sites contain only text, while some also contain pictures, sounds, movies, or any combination of these. Search engines allow users to type one or more keywords so that they can search for the information they are looking for.

3.8 SEARCH ENGINES – TYPES:

Among the various search engines available for use on the Internet, some are commercial, while others are freely available as open source software. There are thus two ways of searching. If the user is interested, user can configure and maintain his

own search engine, or user can be a partner to a full-service search engine provider. Nowadays, almost all Internet sites include many kinds of content viz. plain texts, html pages, word-processor documents, object files (e.g. .pdf files), etc. Therefore, the user's system also needs to support entities such as sgml and extended character sets, such as Unicode. This is because there may also be items in non-English languages which need to be indexed according to local file systems or via the net through search engines. Most search engines operate on the principle that pre-indexed data is easier and faster to search than raw text. The form and quality of the index created from users original html pages is of paramount importance to how the searches are performed, i.e. how fast, how accurately, and with which advanced features. For most search engines, the index takes the form of a highly optimized look-up database.

Search Engines are grouped in to different types based on its contents, information, applications, models etc. The search engines based on topics and contents are Bing, Gigablast, Exalead, Goog;e, Yahoo, Yandex etc. The Metasearch engine are Dogpile, Exite, HotBot, Info.com,, Mamma, Metacrawler, Webcrawler etc. The search engines having geographical coverage are Accoona (China), Biglobe (Japan), Daum (Korea), Guruji.com and Rediff (India), Onkosh (Arab Countries), Yandex (Russia), Zip Local(Canada), etc. There are business based search engines like Business.com, Global Spece, Nexis, Thomasnet, Justdial etc, For jobs searching also search engines helps users and have Naukari.com, Bixee.com (India), Hotjobs.com, carrierbuilder.com, Linkup.com (USA), etc.

The subject wise search engines are also available to search infromation on a particular area of subject or topic viz. Google Scholar, Lexix Nexis, Quicklaw, Westlaw (Legal area), Bing Health, Bioinformatics Harvester, GoPubMed, Healthline, Nextbio, PubGene, WebMD for the medical sciences. BingNews, Daylife, Google News, Yahoo News etc for delivering news. Google maps, Bing Maps, Yahoo Maps, Open Drive, Wikie Media, Nokia Maps, are few other examples. Open source search engines, semantic browsing engines, social search engines, Desk top search engines are few other types of search engines.

http://www.ebizmba.com/articles/search-engines Listed out top 15 search engines in use and they are Google, Bing, Yahoo, Ask, AOL, Mywebsearch, Webcrawler,

WOW, Infospace, Dogpile, Duckduckgo, Info, Lycos, Exite, Blekko etc. Similarly http://www.20search.com/ list out 20 search engines viz. All the web, Alta Vista, AOL Search, Ask Jeeves, Dogpile, Ebay, Exite, Gigablast, IWON, Joeant, Lycos, Mamma, MSN Search, Netscape, OpenDirectory, Webcrawler, Wikiepedia, Yahoo etc.

The web is divided in to visible and invisible web. The visible web or surface web is that one can see the result page from general search engines. It is accessible by general search and includes scholarly contents. Information overload and authenticity is seen in this type of web. The deep or invisible web is that cannot retrieve (see) in serach results and other links. Deep web refers to information served up on web sites that is hidden or inaccessible through traditional search methods. The deep web in short is not accessible but includes scholarly contents and hidden. Many web pages are excluded from most search engines by policy. The contents of most of the searchable databases mounted on the web, such as library catalogues and article databases, are excluded because search engine spiders cannot access them. All this material is referred to as the "Invisible Web" -- what you don't see in search engine results.

The growth in the number of search engines has led to the creation of "meta" search tools, often referred to as multi-threaded search engines. These search engines allow the user to search multiple databases simultaneously, via a single interface. While they do not offer the same level of control over the search interface and search logic, as do individual search engines, most of the multi-threaded engines are very fast. Recently, the capabilities of meta-tools have been extended to include such useful features as the ability to sort results by site, by type of resource or by domain, the ability to select which search engines to include, and the ability to modify results. Such additional features have greatly increased the effectiveness and utility of the meta-tools.

3.9 SEARCH ENGINES - POPULAR:

The search engines listed below are all excellent choices to start with when searching for any type of information. The brief information about each search engine is narated in the following paragraphs.

1) **Google** http://www.google.com

Google claims to have indexed about 1 million web pages and making it the largest crawler based search engine. Google was originally a Stanford University project by students Larry Page and Sergey Brin called BackRub. By 1998, the name had been changed to Google, and the project jumped off campus and became the private company Google. It remains privately held as on today. This search engine is voted and ranked four times as "Most Outstanding Search Engine" by Search Engine Watch readers. Google has well-deserved reputation as the top choice for those searching the web. The crawler-based service provides both comprehensive coverage of the web along with great relevancy. It's highly recommended as a first stop in hunt for whatever looking for.

Google provides the option to find more than web pages, however. Using on the top of the search box on the Google home page, one can easily seek out images from across the web, discussions that are taking place on Usenet newsgroups, locate news information or perform product searching. Using the more link provides access to human-compiled information from the Open Directory. Google is also known for the wide range of features it offers, such as cached links that let "resurrect" dead pages or see older versions of recently changed ones. It offers excellent spell checking, easy access to dictionary definitions, integration of stock quotes, street maps, telephone numbers and more. In addition to Google's unpaid editorial results, the company also operates its own advertising programs. The cost-per-click AdWords program places ads on Google as well as some of Google's partners. Similarly, Google is also a provider of unpaid editorial results to some other search engines. (Library use : Catalogue and information search on various topics)

2) **Yahoo** http://www.yahoo.com

Launched in 1994, Yahoo is the web's oldest "directory," a place where human editors organize web sites into categories. However, in October 2002, Yahoo made a giant shift to crawler-based listings for its main results. These came from Google until February 2004. Now, Yahoo uses its own search technology.

In addition to excellent search results, one can use tabs above the search box on the Yahoo home page to seek images, Yellow Page listings or use Yahoo's excellent shopping search engine and more specialized search options are offered. The Yahoo Directory still survives, "category" links below some of the sites lists in response to a keyword search. When selected these sites takes to a list of web sites that have been reviewed and approved by a human editor.

It's also possible to do a pure search of just the human-compiled Yahoo Directory, which is how the old or "classic" Yahoo used to work. One can get both directory category links ("Related Directory Categories") and "Directory Results," which are the top web site matches drawn from all categories of the Yahoo Directory.

3) **Ask** http://www.ask.com

Ask Jeeves initially gained fame in 1998 and 1999 as being the "natural language" search engine which helps to search by asking questions and responded with right answer to everything. the company at one point had about 100 editors who monitored search logs. They then went out onto the web and located what seemed to be the best sites to match the most popular queries. In 1999, Ask acquired Direct Hit, which had developed the world's first "click popularity" search technology. Then, in 2001, Ask acquired Teoma's unique index and search relevancy technology. Teoma was based upon the clustering concept of subject-specific popularity. Today, Ask depends on crawler-based technology to provide results to its users. These results come from the Teoma algorithm, now known as ExpertRank.

4) **Google Scholar**

Google Scholar provides a simple way to broadly search for scholarly literature. From one place, user can search across many disciplines and sources like articles, theses, books, abstracts from academic publishers, professional societies, online repositories, universities and other web sites. Google Scholar helps in finding relevant work across the world of scholarly research.

Features of Google Scholar

- Search all scholarly literature from one convenient place
- Explore related works, citations, authors, and publications
- Locate the complete document through library or on the web
- Keep up with recent developments in any area of research
- Check who's citing your publications, create a public author profile

5) **Bing** http://www.bing.com/

Bing (known previously as Live Search, Windows Live Search, and MSN Search) is a web search engine. Bing was unveiled by Microsoft CEO Steve Ballmer on May 28, 2009. In September 2013, a new-look Bing was released to tie-in with Microsoft's **"Metro" design language**.

6) **AllTheWeb.com** http://www.alltheweb.com

Powered by Yahoo, you may find AllTheWeb a lighter, more customizable and pleasant "pure search" experience than you get at Yahoo itself. The focus is on web search, but news, picture, video, MP3 and FTP search are also offered. AllTheWeb.com was previously owned by a company called FAST and used as a showcase for company's web search technology. Hence AllTheWeb.com also referred to as FAST or FAST Search. However, the search engine was purchased by search provider Overture in late April 2003, then later become Yahoo's property when Yahoo bought Overture. It no longer has a connection with FAST.

7) **AOL Search** http://aolsearch.aol.com(internal)
http://search.aol.com/ (external)

AOL Search provides users with editorial listings that come Google's crawler-based index. Indeed, the same search on Google and AOL Search hits come up with very similar matches. The difference is primarily "internal" version of AOL Search provides links to content only available within the AOL online service. In this way, one can search AOL and the entire web at the same time. The "external" version lacks these links. Many of Google's features such as "cached" pages are not offered by AOL Search.

8) **HotBot** http://www.hotbot.com

HotBot provides easy access to the web's three major crawler-based search engines: Yahoo, Google and Teoma. Unlike a meta search engine, it cannot blend the results from all of these crawlers together. Nevertheless, it's a fast, easy way to get different web search "opinions" in one place. HotBot's "choose a search engine" interface was introduced in December 2002. However, HotBot has a long history as a search brand before this date. HotBot debuted in May 1996, it gained a strong following among serious searchers for the quality and comprehensiveness of its crawler-based results, which were provided by Inktomi, at the time. It also caught the attention of experienced web users and techies, especially for the unusual colors and interface it continues to support today.

HotBot gained more notoriety when it switched over to using Direct Hit's "clickthrough" results for its main listings in 1999. Direct Hit was then one of the "hot" search engines that had recently appeared. Unfortunately, the quality of Direct Hit's results couldn't match those of another "hot" player that had debuted at the same time, Google. HotBot's popularity began to drop. Even worse, HotBot also suffered by being owned by Lycos (now Terra Lycos). Lycos had acquired HotBot when it purchased Wired Digital in October 1998. Lycos failed to make search a priority on its flagship Lycos site as well as HotBot through much of 1999 and 2000, as it focused instead on adding "portal" features. The company refocused on search in late 2001, making significant improvements to the Lycos site and, as noted, reworked the HotBot site at the end of 2002.

9) **AltaVista** http://www.altavista.com

AltaVista opened in December 1995 and for several years was the "Google" of its day, in terms of providing relevant results and having a loyal group of users that loved the service.

Sadly, an attempt to turn AltaVista into a portal site in 1998 saw the company lose track of the importance of search. Over time, relevancy dropped, as did the freshness of AltaVista's listings and the crawler's coverage of the web. Today, AltaVista is once again focused on search. Results come from Yahoo, and tabs above the search box let you go beyond web search to find images, MP3/Audio, Video, human category listings and news results. If someone want a lighter-feel than Yahoo but to still have Yahoo's results, AltaVista is worth considering. AltaVista was originally owned by Digital, then taken over by Compaq, when that company purchased Digital in 1998. AltaVista was later spun off into a private company, controlled by CMGI. Overture acquired the search engine in April 2003, then it later became part of Yahoo when Yahoo bought Overture.

10) **Gigablast** http://www.gigablast.com

Compared to Google, Yahoo or even Teoma, Gigablast has a tiny index of the web. However, the service is constantly gaining new and interesting features. Give it a whirl, if someone want to try something experimental yet dependable.

11) **Live Search** http://www.live.com/

Live Search (formerly Windows Live Search) is the name of Microsoft's web search engine, successor to MSN Search, designed to compete with the industry leaders Google and Yahoo. The search engine offers some innovative features, such as the ability to view additional search results on the same web page (instead of needing to click through to subsequent search result pages) and the ability to adjust the amount of information displayed for each search-result (i.e. just the title, a short summary, or a longer summary). It also allows the user to save searches and see them updated automatically on Live.com. The service was previously powered by LookSmart results and gained top

marks for having its own team of editors that monitored the most popular searches being performed to hand-pick sites believed to be the most relevant. The system worked well.

12) **LookSmart** http://www.looksmart.com

LookSmart is primarily a human-compiled directory of web sites. It gathers its listings in two ways. Commercial sites pay to be listed in its commercial categories, making the service very much like an electronic "Yellow Pages." However, volunteer editors at the LookSmart-owned Zeal directory also catalogue sites into non-commercial categories for free. Though Zeal is a separate web site, its listings are integrated into LookSmart's results. LookSmart launched independently in October 1996, was backed by Reader's Digest for about a year, and then company executives bought back control of the service.

LookSmart also bought the WiseNut crawler-based search engine in April 2002. WiseNut's are offered through the LookSmart via its Web tab above the search box. Unlike its competitors, the WiseNut crawler has often been out of date, sometimes for months at a time.

Finally, the real gem at LookSmart can be found via its Articles tab. That provides access to content from thousands of periodicals.

13) **Lycos** http://www.lycos.com

Lycos is one of the oldest search engines on the web, launched in 1994. It ceased crawling the web for its own listings in April 1999 and instead provides access to human-powered results from LookSmart for popular queries and crawler-based results from Yahoo for others. Lycos is owned by Terra Lycos, a company formed with Lycos and Terra Networks merged in October 2000. Terra Lycos also owns the HotBot search engine.

14) **Netscape Search** http://search.netscape.com

Owned by AOL Time Warner, Netscape Search uses Google for its main listings, just as does AOL's other major search site, AOL Search. The main

difference between Netscape Search and Google is that Netscape Search lists some of Netscape's own content at the top of its results. Netscape also has a completely different look and feel than Google. If you like either of these reasons, then try Netscape Search. Otherwise, you're probably better off just searching at Google.

15) **Open Directory** http://dmoz.org/

The Open Directory uses volunteer editors to catalogue the web. Formerly known as NewHoo, it was launched in June 1998. It was acquired by AOL Time Warner-owned Netscape in November 1998, and the company pledged that anyone would be able to use information from the directory through an open license arrangement. The site has no "backup" results that kick in should there not be a match in the human-compiled database. In addition, the ranking of sites during keyword searching is poor, alphabetical ordering is used when choose to "browse" categories by topic.

Apart from the search engines there are many resources available on internet which assist in searching information.

16) **Excite**

Excite came from the project Architext, which was started by in February, 1993 by six Stanford undergrad students. They had the idea of using statistical analysis of word relationships to make searching more efficient. They were soon funded, and in mid 1993 they released copies of their search software for use on web sites. Excite was bought by a broadband provider named @Home in January, 1999 for $6.5 billion, and was named Excite@Home. In October, 2001 InfoSpace bought Excite .

17) Other Search Engines and Web Resources:

Now an Internet portal, and was once one of the most recognized brands on the Internet. One of the famous 90's dotcoms on it. Similarly **HotBot** was one of the early Internet search engines (since 1996) launched by Wired Magazine.

Now, just a front end for Ask.com and MSN. **Galaxy** is more of a directory than a search engine. Launched in 1994, Galaxy was the first searchable Internet directory. Part of the Einet division at the MCC Research Consortium at the University of Texas, Austin. **Live Search** (formerly *Windows Live Search* and *MSN Search*) Microsoft's web search engine, designed to compete with Google and Yahoo!. Included as part of the Internet Explorer web browser. **GigaBlast** was developed by an ex-programmer from Infoseek. Gigablast supports nested Boolean search logic using parenthesis and infix notation. A unique search engine, it indexes over 10 billion web pages. **Dogpile:** Brings together searches from the top search engines including Google, Yahoo! Search, Live Search, Ask.com, About, MIVA, LookSmart, and more. **Excite:** Now an Internet portal, was once one of the most recognized brands on the Internet. One of the famous 90's dotcoms. **Mamma:** "The Mother of All Search Engines" - was one of the web's first metasearch engines (1996). Now owned by Copernic Inc. of Montreal, Canada, Mamma.com is a tier 2 search engine. **MetaCrawler** is a metasearch engine that blends the top web search results from Google, Yahoo!, Live Search, Ask.com, About.com, MIVA, LookSmart and other popular search engines. **MetaLib** is a federated search system developed by Ex Libris. MetaLib conducts simultaneous searches in multiple resources such as library catalogs, journal articles, newspapers and the web. **WebCrawler** was used to build the first publicly-available full-text index of a subset of the Web. WebCrawler® brings users the top search results from Google, Yahoo!, Windows Live, Ask and other popular search engines. **Scirus:** The most comprehensive scientific research tool on the web. Over 450 million scientific items indexed at last count. Search journals, scientists' homepages, courseware, pre-print server material, patents, more.(http://www.thesearchenginelist.com/)

Bloglines is a web-based news aggregator for reading syndicated feeds using the RSS and Atom formats. Sold to **Ask.com** in 2005. **BlogScope:** Search & analysis tool for the blogosphere being developed as part of a research project at the University of Toronto. Itcurrently tracks over 23.5 million blogs with 275.6million posts. **Sphere** connects your current articles to contextually relevant content from *your* archives as well as from Blog Posts, Media

Articles, Video, Photos, and Ads from across the Web. **Technorati** catalogs over 112 million weblogs. Known as a kind of gauge for blog popularity as epitomized by its byline of "What's percolating in blogs now". A supporter and contributor to open source software. **FreeBookSearch.net** - Comprehensive book searching portal with more than 30 search engines in its archive, the site searches hundreds of digital libraries and also scours the net for hidden books. **Google Book Search** The power of Google to find books. Google's entry will not let you see full text if the copyright is still active in your jurisdiction. **Alibaba.com** - Claims to be the world's largest database of suppliers. Based in China, it is a marketplace of export and import, offers search, company directory, catalog, trade leads and more**Hoovers:** A Dun & Bradstreet Company, maintains a database of over 23 million companies. Some information is provided free, other information is available to paid subscribers. Good for company stock information.. **Kompass:** *2.3M* companies in *70* countries referenced by *57.000* product & service keywords *860.000* trade names and *4.6M* executive names. A guide for worldwide sourcing. **Lexis Nexis**: LexisNexis claims to be the "world's largest collection of public records, unpublished opinions, forms, legal, news, and business information". Searchable archive of newspapers, public records & more. **ThomasNet:** Powered by the Thomas Register of American Manufacturers (The Big Green Books published since 1898). Catalogs over 650,000 American companies in 67,000 categories. **Email-Search.org**: A mini-portal with a number of tools for searching email addresses. Find current, former email addresses, extract them from the web. **TEK search engine** is an email-based search engine developed at the Massachusetts Institute of Technology. The search engine enables users to search the Web using only email. It is intended to be used by people with low internet connectivity. **AskMeNow:** S3 - Semantic Search Solution for mobile telephones. AskMeNow offers a consumer mobile search utilizing proprietary technology & natural language based interaction. **Exalead**: exalead one: Enterprise. **Exalead** - Internet search engine, image search engine, video search engine WebImagesWikipediaVideoMore. Advanced search. 8 billion pages indexed to date. **Funnelback** is an Internet and Enterprise search engine company offering a suite of search solutions, hosted solution for the web and a fully

customisable enterprise solution for searching behind the firewall. **Google Search Appliance:** Make it as easy for employees to find information inside your organization as it is to find information on google.com. Deploy a Google Search Appliance. **Microsoft's SharePoint Search Services:** Microsoft Search Server (MSS) is an enterprise search platform from Microsoft, based on MS Office SharePoint Server. MSS shares its architecture with Windows Search. **Northern Light Search**: Search articles from over 800 online news feeds and over 1,000 industry authority blogs. **Open Text (Hummingbird):** Enterprise Content Management (ECM) software solutions supporting +/- 20 million seats across 13,000 deployments in 114 countries and 12 languages worldwide. **Wazap** is a vertical search engine, video game database and social networking site that distributes gaming news, rankings, cheats, downloads and reviews. **Wink:** Wink People Search: Over 333,304,647 people on social networks and across the Web. Find people using name search, location, school, work, interests, and more. **Accoona:** A search engine that uses artificial intelligence. In addition to traditional searches, it allows business profile searches, and its signature "SuperTarget" feature. Partnered with China Daily, a large Chinese portal. **Guruji.com**: India - an Indian Internet search engine that is focused on providing better search results to Indian consumers, by leveraging proprietary algorithms and data in the Indian context. **MetaCafe:** Search videos hosted by MetaCafe. If you are a producer of videos, you can get paid for videos - the more viewers, the more cash. **InfoSpace:** From their webpage, "The yellow pages and white pages directory from **InfoSpace** is the most convenient way to find people and businesses." **AskWiki Beta** is a preliminary integration of a semantic search engine that seeks to provide specific answers to questions using information from Wikipedia articles.(http://www.thesearchenginelist.com/)

18) Search Engines Used in India

Top search engines used in India in 2013 are listed at http://www.way2sites.com/2011/12/search-engines-list-india.html. Few of them are :

- **Google.com (Google.co.in)** Google is the world's best search engine. Search the world's information, including webpages, images, videos and more. **Bing.com** Bing is a search engine that brings together the best of search and people in your social networks to help you spend less time searching and more time doing. **Ask.com** Ask.com is the #1 question answering service that delivers the best answers from the web and real people - all in one place. **Aol.in** The AOL (americain online) search engine delivers great search results, enhanced by Google. **Webcrawler.com** Webcrawler.com is the first fully indexed search engine, providing a powerful research tool through mixed results, or Meta Search. **Search.com** Search the Web by searching the best engines from one place. IT shows the information from top search engines in the world. **Excite.com** Excite is the leading personalization Web portal, featuring world-class search, content and functionality. From financial portfolios to sports scores, local weather forecasts to movie listings, Excite gathers what matters most to you every day. **Goodsearch.com** GoodSearch - Search the web to support your charity. Also, find online coupons, coupon codes, deals, discounts and promo codes at GoodShop. **www.guruji.com** GURUJI.COM SEARCH - India's 1st Search Engine Over 3 Million users have switched to Guruji.com Music Search to GET Music. **Mywebsearch.com** MyWebSearch brings together the most comprehensive collection of search tools available to provide you with the information you need when you need it. **Lycos.com** Lycos is your source for all the Web has to offer - search, free online games, e-mail, build free websites, videos & movies, news, weather and more. **Dogpile.com** Dogpile.com makes searching the Web easy, because it has all the best search engines piled into one. Go Fetch!

- **MetaSearch Engines**

  Most meta search engines draw their search results from multiple other search engines, then combine and rerank those results. This was a useful feature back when search engines were less savvy at crawling the web and each engine had a significantly unique index. As search has improved the need for meta search engines has been reduced. Hotbot was owned by Wired, had funky colors, fast

results, and a cool name that sounded geeky, but died off not long after Lycos bought it and ignored it. Upon rebirth it was born as a meta search engine. Unlike most meta search engines, Hotbot only pulls results from one search engine at a time, but it allows searchers to select amongst a few of the more popular search engines on the web. Currently Dogpile, owned by Infospace, is probably the most popular meta search engine on the market, but like all other meta search engines, it has limited market share. One of the larger problems with meta search in general is that most meta search engines tend to mix pay per click ads in their organic search results, and for some commercial queries 70% or more of the search results may be paid results.

- **Other Resources Used by Users:**

  The other resources used are databases, web directories, web tools etc the comparison of resources with search engines are highlighted below:

Difference Between Databases and Search engines

- **Databases:**

  Databases are usually collections of articles from journal and magazines, dissertations, reviews, and abstracts etc. A database consists of individual records. Each record contains all of the information in the database for an individual item, which provides a brief description of that item. Each record is composed of fields. A field defines the individual elements of each record. The databases are searchable through various angles. Database allows users to search for information from an organized collection and provides more relevant results, through the use of subject headings and descriptors. Users can also search for keywords in specific fields, such as author and title, and limit their results using various criteria. The content of databases has undergone a review process and the information is more reliable than information found on the Internet. Often databases provide access to full-text magazine and journal articles.

- **Search engines**

A search engine is a service that utilizes a computer program to search the Internet and identify items that match the characters and keywords entered by a user. Search engines are useful for finding information on organizations, groups, and personal web pages related to a topic. They can also be used for finding articles, but it can be difficult to narrow down results, find relevant material, and assess the legitimacy of information found on the Internet. It is especially important to be wary when using Internet sources, as there are no quality control mechanisms that verify the validity of information on individual web pages .Examples of search engines include Google, Yahoo, and Bing.

- **Search Engines vs Directories:**

  All major search engines have some limited editorial review process, but the bulk of relevancy at major search engines is driven by automated search algorithms which harness the power of the link graph on the web. Unlike highly automated search engines, directories are manually compiled taxonomies of websites. Directories are far more cost and time intensive to maintain due to their lack of scalability and the necessary human input to create each listing and periodically check the quality of the listed websites.

- **Web Directories:**

  VLib: Tim Berners-Lee set up the web by creating the Virtual Library, which became a loose confederation of topical experts maintaining relevant topical link lists. **EINet Galaxy** a web directory was born in January of 1994. It was organized similar to web directories of today. The biggest reason the EINet Galaxy became a success was that it also contained Gopher and Telnet search features in addition to its web search feature. The web size in early 1994 did not really require a web directory; however, other directories soon did follow.
  Yahoo! Directory

  In April 1994 David Filo and Jerry Yang created the Yahoo! Directory as a collection of their favorite web pages. As their number of links grew they had

to reorganize and become a searchable directory. What set the directories above The Wanderer is that they provided a human compiled description with each URL. As time passed and the Yahoo! Directory grew Yahoo! began charging commercial sites for inclusion. Many informational sites are still added to the Yahoo! Directory for free. **Open Directory Project** In 1998 Rich Skrenta and a small group of friends created the Open Directory Project, which is a directory which anybody can download and use in whole or part. The ODP (also known as DMOZ) is the largest internet directory, almost entirely ran by a group of volunteer editors. The Open Directory Project was grown out of frustration webmasters faced waiting to be included in the Yahoo! Directory. Netscape bought the Open Directory Project in November, 1998. **LII** Google offers a librarian newsletter to help librarians and other web editors help make information more accessible and categorize the web. The second Google librarian newsletter came from Karen G. Schneider, who is the director of Librarians' Internet Index. LII is a high quality directory aimed at librarians. Her article explains what she and her staff look for when looking for quality credible resources to add to the LII. Most other directories, especially those which have a paid inclusion option, hold lower standards than selected limited catalogs created by librarians. The Internet Public Library is another well kept directory of websites. **Business.com** Due to the time intensive nature of running a directory, and the general lack of scalability of a business model the quality and size of directories sharply drops off after you get past the first half dozen or so general directories. There are also numerous smaller industry, vertically, or locally oriented directories. Business.com, for example, is a directory of business websites.

Looking at the practice of today's digital library portals the impression about internet is useful in the academic resource discovery environment. Along with this online library catalogues, electronic journals and e-books, databases are well known for a long time. Content is generally delivered through well-established service channels by publishers, book-houses or subscription agencies. The digitisation of print resources, e- publishing and the advent of the World Wide Web have resulted in the proliferation of a vast amount of content types and formats that include, digitised collections, faculty and

research groups' websites, conference web servers, preprint/e-print servers and, increasingly, institutional repositories and archives, as well as a wide range of learning objects and courses. (Lossan 2004)

- **Search Engine Optimization**

  Search engine optimization is the art and science of publishing information in a format which makes search engines believe that content satisfies the needs of their users for relevant search queries. Early search engine optimization consisted mostly of using descriptive file names, page titles, and meta descriptions. As search advanced on the page factors grew more important and then people started trying to aim for specific keyword densities.

- **Academic Search Engines:**

  Users need to take care while using search engines for searching information and the satisfaction depends on search strategy developed and search engine selected by the user or searcher. Similar the quality of searches also depends on quality of search engines used for searching information. Therefore search engines and meta search engine need to be analysed qualitatively and quantitatively. Most used popular search engines for academic searches are: Google, Google Scholor, Scirus etc.

- **Google scholar**

  Google scholar provides a simple way to gather information from many disciplines and searches from different sources, peer reviewed papers, theses, books, abstracts, articles from academic society and world scholar research data. (Chakrabarty and Randhwa 2006)

  Features:

  - Search diverse sources from one convenient place
  - Gets papers, also abstracts and citations
  - Collect full text papers
  - Key papers in any area of research

- Indexes articles , theses . Indexes scholarly articles.
- Usage statistics available on web logs
- Single search and advanced search is possible

Life science, business, finance, social science, chemistry, finance, social science, chemist, material science, engineering science, medicine, pharmacies, astrology, etc are covered

- **Use for Librarian and Libraries:**

  Google search Engine helps users to search and utilize text but Google scholar provides solution to help librarians to locate scantly literature from electronic and print resources. The libraries gets the data in Google scholar search and helps to any needy user. Links of OCLC's open worked cat is also made available. For this limits now to join the OCLC open word cat program in order to get link on Google scholar Google knows which links has Google groups can be possible accessible thy Google scholar these service provides links to get the data. For librarians different search engines are useful like Public Internet Library, Google Scholar, Scirus, etc

- **Scirus** (For Scientific Information Any)

  Scirus is a powerful internet search tool specially useful for finding scientific information Scirus search engines is specifically developed for scientist researcher and students. It holds any one for search for scientific information to published information they need which include peer-reviewed articles, Patent information, home pages, and view web sites very quickly. (Chakrabarty and Randhwa 2006)

Features-:

- Searches complete web, targets for scientific information
- Searches more than 250 million Service related pages
- Finds Peer-reviewed articles than any other search Engine
- Reads as formats to file
- Gives more precise results due to indexes

- Search pinpointed scientific technical and medical data on web
- Find latest peer-reviewed articles patents preprints and data from other search engine
- Scirus crawls and indexes scientific sites and adds to these sites in it which helps users for searching information while subject based alerts are needed.
- Supports to basic and advance search
- Searches information form abstracts articles, blogs, homepages, Conferences, Patents, etc.

Windows Live Academic (WLA) :

WLA searches academic journals and contents from articles. It claims to help in pinpointed search by eliminating irrelevant contents. The search service is designed to help students, researchers and university faculty to conduct research. (Chakrabarty and Randhwa 2006)

Features:

- Serve as powerful research aid
- Search through thousands of articles journals
- A preview pane allows users to see abstarcts
- citation support
- helps publishers connect with more readers

Among all these three search engines Scirus is the most useful search engine followed by Google Scholar.

Conclusion:

If users today wish to obtain information from any knowledge repository in the global village, they have to first familiarize themselves with a variety of search tools and develop effective search techniques. If they wish to take advantage of the resources from the Internet without spending hours, then search engines come into the picture, to sift, sort and present before the users what they desire from a sea of irrelevant, uncharted and often, unverified information. Modern search engines have boosted up research, e-commerce and other academic activities and enable all sections of users' communities to get more resources for their purpose. In order to cope with different

search engines, their tools and techniques, the users must become familiar with them. Over and above all, students of Library and Information Science, who are the future managers of our knowledge-driven society, should be adequately prepared for such tasks, which implies the necessity for immediate revision and upgrading of course curriculum for Library and Information Science throughout our country.

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CHAPTER-IV

SEARCH ENGINES : COMPARISON

CHAPTER-IV

SEARCH ENGINES : COMPARISON

4.1 INTRODUCTION:

In recent years, Internet has emerged as the most powerful medium for storage and retrieval of information. It works round the clock and connects every nook and corner of the globe. "With an unprecedented growth in the quantum of knowledge worldwide and the easy accessibility, Internet has become an unavoidable necessity for every institution of higher learning and research (Ali 2001)". Internet protocols allow many different network technologies form local area networks to wide area networks to be interconnected for information communication and its application. It supports audio and video clips as well as the text and images (Mahajan 2001). Thus the Internet is at once a world-wide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computers without regard for geographic location.

The World Wide Web is abbreviated as WWW or referred simply as the Web which is a is a system of internet servers that supports hypertext to access information available over the Internet. Because of Web's ability to work with multimedia and advanced programming languages, the Web is the fastest-growing component of the Internet. It is, thus a collection of millions of files stored on thousands of computers (called servers) all over the world. The World Wide Web has revolutionized the way the people access information, and has opened up new possibilities in areas such as digital libraries, information dissemination and retrieval, assisting users in different areas like education, commerce, entertainment, government and health care. Barrier and Presti (1996) indicated that web is a tool and "The amount of publicly available information on the web is increasing consistently at an unbelievable rate" similarly information on any topic is made available using internet. Poulter (1997) rightly pointed out in his critical review regarding web is that "It is a gigantic digital library, of a searchable 15 billion-word encyclopaedia". It has stimulated research and development in information retrieval and dissemination.

4.2 SEARCH ENGINES:

One of the key aspects of the World Wide Web, is that they makes valuable information resource in full text of document and can be searched using web search engines. Using search engine it is possible to make available and obtain information from the Internet. Search engines are the mechanisms that aids users to search the entire Internet for relevant information. They automatically process to update, modify and maintain the resources available on web sites and web pages. They index all the information floating on the net; categorize information into various heads and then present for searching by the users based on search terms. They provide key word searching capability, based on the indexing of text contained within a document and deliver a list of WWW link (URL's) that contain the key word entered in the search statement. According to Alan Poulter (1997), "A www search engine is defined as retrieval service, consisting of a database(s) describing mainly resources available on the www, search software and a user interface also available via www". All the Crawler-based web search engines mainly consist of three major parts. The first is the Spiders, also referred to as robots, crawlers or worms. The task of Spiders is to crawl the web, to roam and move to the Internet periodically. And their goal is to find the content and information to add to the search engine's database. Everything, the spider finds goes into the second part of the search engine, the index. It is sometimes also referred as catalogue. It is a huge repository like a giant book. It contains a copy of every web page that the spiders find. The Index is updated for any change in the web pages. Search engine software is the third part of a search engine. This is the program that sifts through the millions of pages recorded in the index to find matches to a search and rank them in order of what it believes is most relevant. All crawler-based search engines have the basic parts described above, but there are differences in how these parts are tuned. That is why the same search on different search engines often produces different results. (http://searchenginewatch.com/webmasters/article.php/2168031)

The World Wide Web has revolutionized the way the people access information, and has opened up new possibilities in areas such as digital libraries, information dissemination and retrieval, education, commerce, entertainment, government and health care. "The amount of publicly available information on the web is increasing consistently at an unbelievable rate (Lawrence and Giles 1998)". "It is a gigantic

digital library, a searchable 15 billion-word encyclopaedia (Barrier and Presti 1996)". It has stimulated research and development in information retrieval and dissemination.

4.3 WEB SEARCH ENGINES:

In the following table few useful search engines are briefly discussed with stating their features.

Table 4.1 Features of General Search Engines

Search Engines	Features
Northern Light	Special Collection, Easy Visual Navigation for Results, Overview Browse Using Folder Categories, Precise Searches with Broad subject Coverage
Infoseek	Groups Results by Site (Fewer Duplicates), Emphasizes First Term of Search Both a Directory and a Search Engine, Natural Language Query, Input New Metasearch Software, Useful Descriptions in the Citation
Excite	Concept Searching, Good Coverage from High Quality Sites
AltaVista	Foreign Language Capability, Query Formulation Aids, Best Foreign Site Coverage, Definitions of Terms on Results, Page Suggests Related Sites Using Ask Jeeves Technology to Pick Relevant Questions
Hot Boot	Extensive Field Searching , Direct Hit Feature, Good Product Coverage, Returns Too Many Duplicates
In Find	Good Metasearch Engine, Groups Sites in Useful Categories by Type or Domain, Removes Duplicates, Precision Known item Broad subject search, Field searching, Fishing expeditions AND instead of OR Keywords with no operators, Specialized sites like NCSTRL, Rare words

4.4 POPULAR GENERAL SEARCH ENGINES:

Many search engines have similar features but their search mechanisms work in slightly works in different ways. While searching information on net it is always necessary and beneficial to try more than one search engine, if having difficulty in locating required information. There are many search engines very popular die the information society to use. Few popular search engines like Google, Yahoo, Bing etc. and their features are narrated in table 4.2.

Table 4.2: Features of Popular Search Engines

Google	A very popular Search engine that includes dedicated products for searching news, images, maps, scholarly research papers. It is the home of email service Gmail and allows the user to search Australian sites only.
Yahoo!	Yahoo! is an early search engine originally designed as a searchable directory. It now provides news and many social networking features on its homepage. Allows the user to search Australian sites.
Bing	Formerly known as MSN and Live Search, Bing is very similar to Google in look and feel. Bing is also affiliated with Hotmail and MSN chat.
AOL	AOL is powered by Google and therefore has a very similar look and feel. AOL is the largest advertising-supported web company in the USA.
Ask	Formerly known as Ask Jeeves, Ask is a natural language search engine that allows users to pose full questions and phrases.
Web Wombat	Not as widely used as the above but is one of Australia's oldest search engines.

4.5 META SEARCH ENGINES:

It is not possible to search all the search engines independently which consumes more time in gathering information. Repetitive information is also possible in getting the data when searched search engine individually. The role of metadata search engine is useful in searching all the data effectively avoiding duplication. Hence use of meta search engines is beneficial which combines two or more search engines and enable to search them simultaneously.

Table 4.3 Features of Few Meta Search Engines

PolyCola	Formerly known as GahooYoogle, PolyCola allows to search any two major search engines at the same time, and see the results from each engine in a split screen.
Dogpile	One of the first meta search engines, Dogpile searches four top search engines simultaneously and provides one set of combined results that covers all engines. Dogpile searches Yahoo, Google, MSN, and Ask Jeeves. You can also use Dogpile to find audio, video, news items, and yellow page listings. The advanced search allows you to limit by domain name, language, and date.
Mamma	Mamma searches a range of lesser known search engines and directories such as **EntireWeb, Open Directory** and **About.com** to retrieve results that are not always found in the large search engines.

4.6 DIRECTORIES:

Directories list websites by category and subcategory and are often maintained by groups of editors or subject experts who make decisions on what to include in each category. One can search directories by key words or use the listed topics to browse to relevant websites.

Table 4.4 Features of Useful Directories

Yahoo! Directory	One of the original Internet search tools, Yahoo! Directory is also one of the world's largest commercial Internet search directories. Most of its sites are suggested by other users and then evaluated by editors.
Open Directory	The DMOZ Open Directory Project is the largest human-edited directory of the world Wide Web. It is constructed and maintained by volunteer editors from all over the world.
WWW Virtual Library	Started by Tim Berners-Lee, creator of the world Wide Web, the WWW Virtual Library is the oldest catalogue of the web. While it is not very large, The WWW Virtual Library is known for its high quality lists of websites.
Librarians' Internet Index	The LII is administered by the Californian State Librarian, and experienced library staff from many Californian libraries are responsible for selecting quality websites for inclusion in the index.
Intute	Owned and maintained by a consortium of universities in the United Kingdom, Intute provides access to web resources for education and research which have been chosen and evaluated by subject specialists.

4.7 OTHER SEARCH ENGINES:

Search engines are routinely created, updated, changed, re-named, merged, bought and sold. There are large numbers of websites that provide information and advice on search engines. Some of these are listed here:

Table 4.5 Features of Search Engines

AskNow search tips **WebReference** **SearchEngine Watch**	For search tips and help on getting the most out of selected searches.
NoodleTools **University of California, Berkeley Library** **SearchEngineWatch**	To help to work out which search engine is best for fulfilling needs
Phil Bradley's website **Wikipedia** **Children's search engines** **Homework help**	To find more search engines
SearchEngineWatch **Monash Research** **How Stuff Works**	To learn about how search engines work
Resource Shelf **Search Engine Showdown**	To keep up to date with the world of search engines

4.8 WEB 2.0 TOOLS:

There are many other ways to find materials on the Internet such as music, video, photos and books. Web 2.0 tools allow you to connect with other people on the Internet and share just about everything from news and photos to books. The websites below are some of the most popular Web 2.0 tools.

Table 4.6 Web Tools for Integrating Information

Facebook	Similar to MySpace, Facebook allows you to find and connect with other people, and share photos, videos and links. It's also used by groups and organisations as a means of advertising. There is a **National Library of Australia appreciation group** in Facebook.
Windows Live Messenger	Connect and chat to your friends, family and colleagues. You can chat to each other in real time and share files, photos, links and videos. If your friends are offline you can leave messages for them to read later.
YouTube	YouTube was founded in 2005 and now contains a massive online collection of videos. You can search for and watch an endless variety of videos as well as adding your own for others to watch. There are a number of National Library of Australia videos in YouTube, which you can find by searching for 'National Library of Australia'.
Flickr	Flickr is an online photo management and sharing site. You can view photos taken by people all over the world and you can also create your own online albums to share with others. A large number of photos from Flickr can be found in **Picture Australia.**
Delicious	Delicious is a social bookmarking service that allows you to save your favourite websites and search for websites saved by other people. Access your favourites from any computer and locate websites other people have saved as their favourites. The AskNow chat reference service uses a Delicious tag cloud to

	display links to **useful resources**.
LibraryThing	LibraryThing allows you to catalogue and keep records of all the books you own or have read. You can add reviews, find similar books and make recommendations to other people. The National Library has incorporated links to LibraryThing in some of its catalogue entries.
Wikipedia	Wikipedia is a web based encyclopaedia written collaboratively by volunteers from all over the world. Since its beginning in 2001 Wikipedia has grown into one of the largest reference websites, currently with over 2 and a half million articles in English. You can use Wikipedia to find information, correct and expand articles or add your own.
Twitter	Twitter is a **microblogging** service that allows you to keep in touch with family, friends and colleagues by means of short messages that can be read online or sent to your mobile phone or instant messaging service.

4.9 ACADEMIC DIRECTORIES AND SEARCH ENGINES:

If someone need to find scholarly academic information and material on the web, try using some search engines or web directories that specialize in academic or educational sectors.

Table 4.7 Academic Search Engines

Google **www.google.com** **Search Tips**	Google has many advanced search options that will help to find useful information. • **Advanced searching in Google** - The advanced search in Google allows you to limit your search by domain name, for example specifying that you only want .edu pages. • **Google U.S. Government** - A Google search of U.S. government websites only. This search engine is useful if you are researching current issues or controversial topics.

	Many government agencies maintain informative webpages with detailed documents and reports freely available online.
GoogleScholar **Google Scholar**	Google Scholar is a new beta search engine from Google that is designed to help people find scholarly material on the web. Although it is too early to tell for sure what portion of scholarly material may be included in Google Scholar, it may be useful for locating material such as research studies funded by the government, scholarly prepublication article archives, and "grey literature," -- material that may be scholarly but not published through traditional publishing channels. Some of the material you find on Google Scholar may not be available for free via Google Scholar, but may be available to you as a member of the Tufts University community. In order to take advantage of being a "Tufts person," search Google Scholar using the link on the **Databases and Articles list**, or just use this link: **http://www.library.tufts.edu/ezproxy/ezproxy.asp?LOCATION=GoogleScholar**. If when you are using Google Scholar you find a citation for an article and an option to buy it, double check the **Tufts Catalog** and the **Electronic Journals List** to see if we subscribe. If not, use our **ILLiad document delivery service** to request copies of articles from journals that we don't own.
Yahoo **search.yahoo.com**	Yahoo allows you to search for webpages, images, news, and local information. The **advanced search page** allows you to limit by language, domain name, file format, and country of origin.

4.10 SEARCH ENGINE (BASED ON UTILITY/SUBJECT):

The search Engines are compared based on the subject and its utility and presented in the following table.

Table 4.8 Comparison of Search Engines (Based on Subject and Utility)

Type	Search Engine	Description
All-Purpose Search Engines	Google	Google - **The world's most popular search engine.**
	bing	**Bing** Search: Microsoft's entry into the burgeoning search engine market. Better late than never.
	YAHOO! SEARCH	**Yahoo!** Search: The 2nd largest search engine on the web (as defined by a September 2007 **Nielsen Netratings** report.
	altavista	**AltaVista:** Launched in 1995, built by researchers at Digital Equipment Corporation's Western Research Laboratory. From 1996 powered Yahoo! Search, since 2003 - Yahoo technology powers AltaVista.
	cuil	**Cuil:** Cuil was a search engine website (pronounced as Cool) developed by a team of ex-Googlers and others from Altavista and IBM. Cuil, termed as the 'Google Killer' was launched in July, 2008 and claimed to be world's largest search engine, indexing three times as many pages as Google and ten times that of MS. Now defunct.
	excite	**Excite:** Now an Internet portal, was once one of the most recognized brands on the Internet. One of the famous 90's dotcoms.
	Go	**Go.com:** The Walt Disney Group's search engine is now also an entire portal. Family-

Type	Search Engine	Description
		friendly!
		**HotBot** was one of the early Internet search engines (since 1996) launched by Wired Magazine. Now, just a front end for Ask.com and MSN.
		**AllTheWeb:** Search tool owned by Yahoo and using its database, but presenting results differently.
		**Galaxy:** More of a directory than a search engine. Launched in 1994, Galaxy was the first searchable Internet directory. Part of the Einet division at the MCC Research Consortium at the University of Texas, Austin
		**search.aol:** Now powered by Google. **It is now official**.
		**Live Search** (formerly *Windows Live Search* and *MSN Search*) Microsoft's web search engine, designed to compete with Google and Yahoo!. Included as part of the Internet Explorer web browser.
		**Lycos:** Initial focus was broadband entertainment content, still a top 5 Internet portal and the 13th largest online property according to Media Metrix.
		**GigaBlast** was developed by an ex-programmer from Infoseek. Gigablast supports nested boolean search logic using parenthesis and infix notation. A unique search engine, it indexes over 10 billion web pages.
		**Alexa Internet**: A subsidiary of Amazon known more for providing website traffic information. Search was provided by Google,

Type	Search Engine	Description
		then Live Search, now in-house applicaitons run their own search.
Accounting	**IFAC.com**	**IFAC.com:** For resources and information on Ifrs and Accounting.
Bit Torrent	btjunkie	**Btjunkie:** An advanced BitTorrent search engine. It uses a web crawler (similar to Google) to search for torrent files from other torrent sites and store them in its database. It has over 1,800,000 active torrents.
	Demonoid.com	**Demonoid**: A BitTorrent tracker set up by a person known only as Deimos. The website indexed torrents uploaded by its members. Taken offline after legal threats to its Hosting Company by **CRIA.**
	Flixflux.com	**FlixFlux:** From its website, "The ultimate torrent site for films, combining bittorrent search results with film information, making it easy to find new film releases."
	ISOHUNT.com	**isoHunt**, a **comprehensive BitTorrent search engine**, P2P file search and community. Over 930,000 torrents in its database and 16 million peers from indexed torrents. Avg: 40 million searches per month.
	mininova	**Mininova:** Successor to Suprnova.org - a search engine and directory of torrent files. Anonymous uploads, no IP address logging of users, no porn. over 550,000 torrents in the database, over 4 Billion downloads.
	The Pirate Bay	**The Pirate Bay** (*aka "TPB"*): Based in Sweden where torrent trackers are not illegal. No content is filtered or removed as long as it is clearly labeled.

Type	Search Engine	Description
	torrentspy	**TorrentSpy:** Tracks externally hosted torrent files and provides a forum to comment on them. Integrates **Digg**-like user-driven content site ShoutWire's feed into its front page.
	Torrentz	**Torrentz:** Tracks nearly 7 million torrents in a searchable portal.
Blog	amatomu.com	**Amatomu:** The South African Blogosphere, sorted. Amatomu searches blogs with a distinct focus on South Africa.
	Bloglines	**Bloglines** is a web-based news aggregator for reading syndicated feeds using the RSS and Atom formats. Sold to **Ask.com** in 2005.
	Blogperfect	**Blogperfect:** Google Powered Blog Search
	blogScope	**BlogScope:** Search & analysis tool for the blogosphere being developed as part of a research project at the University of Toronto. Itcurrently tracks over 23.5 million blogs with 275.6million posts.
	ICEROCKET	**IceRocket:** An Internet search engine for searching blogs.
	sphere	**Sphere** connects your current articles to contextually relevant content from *your* archives as well as from Blog Posts, Media Articles, Video, Photos, and Ads from across the Web.
		Technorati catalogs over 112 million weblogs. Known as a kind of gauge for blog popularity as epitomized by its byline of "What's percolating in blogs now". A supporter and contributor to open source software.
Books	FREE BOOK SEARCH.NET	**FreeBookSearch.net** - Comprehensive book searching portal with more than 30 search

Type	Search Engine	Description
		engines in its archive, the site searches hundreds of digital libraries and also scours the net for hidden books.
	Google	**Google Book Search** The power of Google to find books. Google's entry will not let you see full text if the copyright is still active in your jurisdiction.
Business	Alibaba.com Global trade starts here.™	**Alibaba.com** - Claims to be the world's largest database of suppliers. Based in China, it is a marketplace of export and import, offers search, company directory, catalog, trade leads and more.
	BANKERSAlmanac.com The intelligent source	**Bankersalmanac.com** provides intelligent reference data solutions to the banking industry for payments, due diligence, risk assessment and financial research.
	BUSINESS.COM	**business.com:** contains more than 400,000 listings within about 65,000 categories. Search results are preceded by four types of paid links.
	HOOVERS	**Hoovers:** A Dun & Bradstreet Company, maintains a database of over 23 million companies. Some information is provided free, other information is available to paid subscribers. Good for company stock information.
	KOMPASS connects business to business	**Kompass:** *2.3M* companies in *70* countries referenced by *57.000* product & service keywords *860.000* trade names and *4.6M* executive names. A guide for worldwide sourcing.
	LexisNexis	**Lexis Nexis**: LexisNexis claims to be the "world's largest collection of public records,

Type	Search Engine	Description
		unpublished opinions, forms, legal, news, and business information". Searchable archive of newspapers, public records & more.
	ThomasNet.com	**ThomasNet:** Powered by the Thomas Register of American Manufacturers (The Big Green Books published since 1898). Catalogs over 650,000 American companies in 67,000 categories.
Email	**eMail-Search.org**	**Email-Search.org**: A mini-portal with a number of tools for searching email addresses. Find current, former email addresses, extract them from the web.
	nicado	**Nicado**: Free to register, Search email addresses. The Nicado search engine allows registered users to search the Nicado database using an email address or telephone number.
	TEK TIME EQUALS KNOWLEDGE	**TEK search engine** is an email-based search engine developed at the Massachusetts Institute of Technology. The search engine enables users to search the Web using only email. It is intended to be used by people with low internet connectivity.
Enterprise	AskMeNow	**AskMeNow:** S3 - Semantic Search Solution for mobile telephones. AskMeNow offers a consumer mobile search utilizing proprietary technology & natural language based interaction.
	Autonomy	**Autonomy:** IDOL Server (Intelligent Data Operating Layer), K2 Enterprise (Formerly Verity), Ultraseek
	dieselpoint	**Dieselpoint**: Search & Navigation. Dieselpoint provides advanced full-text search with data

Type	Search Engine	Description
		navigation capability. It gives users highly relevant results not possible with either traditional search engines or SQL databases.
		**dtSearch** Engine (SDK), dtSearch Web. dtSearch provides simple to use but very powerful tools which create and maintain full text indexes of documents and data. Terabytes of text can be searched.
		**Endeca's** search and information access solutions help enterprises find, analyze, and understand information. This is the Guided Navigation experience.
		**Exalead**: exalead one: Enterprise. **Exalead** - Internet search engine, image search engine, video search engine ... WebImagesWikipediaVideoMore » · Advanced search. 8 billion pages indexed to date.
		**Expert System Sp. A.** (Cogito) is a pioneer in developing semantic technologies to understand and manage unstructured information. Expert System's semantic approach enables rapid classification of information.
		**Fast Search & Transfer**: Enterprise Search Platform (ESP), RetrievalWare (formerly Convera)
		**Funnelback** is an Internet and Enterprise search engine company offering a suite of search solutions, hosted solution for the web and a fully customisable enterprise solution for searching behind the firewall.
		**Google Search Appliance:** Make it as easy for employees to find information inside your

Type	Search Engine	Description
		organization as it is to find information on google.com. Deploy a Google Search Appliance.
	Microsoft Office SharePoint	**Microsoft's SharePoint Search Services:** Microsoft Search Server (MSS) is an enterprise search platform from Microsoft, based on MS Office SharePoint Server. MSS shares its architecture with Windows Search.
	Northern Light	**Northern Light Search**: Search articles from over 800 online news feeds and over 1,000 industry authority blogs.
	OPEN TEXT The Content Experts	**Open Text (Hummingbird):** Enterprise Content Management (ECM) software solutions supporting +/- 20 million seats across 13,000 deployments in 114 countries and 12 languages worldwide.
	ORACLE SECURE ENTERPRISE SEARCH 10g	**Oracle Secure Enterprise Search 10g**, a standalone product from Oracle, enables a secure, high quality, easy-to-use search across all enterprise information assets.
	SAP	**SAP** NetWeaver Search and Classification (TREX) finds information in both structured and unstructured data. TREX provides SAP applications with services for searching and classifying large collections of documents.
	SAIC TeraText	**TeraText Suite:** Most data resides in semi-structured, primarily textual documents, not in structured, organizational repositories. Teratext is designed for text-rich data repositories.
	Vivisimo	**Vivisimo** Clustering Engine developed by scientists based upon a mathematical algorithm and deep linguistic knowledge to find

Type	Search Engine	Description
		relationships between search terms and bring them to light. (Web search: **Clusty**)
	ZyLAB	**ZyIMAGE** Information Access Platform for government and corporates does **capturing, archiving, searching, security,** and context-specific content-management.
Forum	Omgili	**Omgili (Oh My God, I Love It!):** Find out what people are saying. Personal experiences, solutions to problems, ideas and opinions.
Games	Cheatsearch.org	**Cheatsearch.org**: Finds Game Cheats from all over the web. Searches all of the most popular cheat sites and forums to find cheats for any game.
	GenieKnows	**Genie Knows**: A division of IT Interactive Services Inc., a Canadian vertical search engine company concentrating on niche markets: health search, video games search, and local business directory search.
	Wazap!	**Wazap** is a vertical search engine, video game database and social networking site that distributes gaming news, rankings, cheats, downloads and reviews.
Human Search	ChaCha	**ChaCha Search** is a search engine that pays human "guides" to answer questions for users. This is a technique known as social searching.
	eurekster swicki	**Eurekster** is a New Zealand company, with an office located in San Francisco, California, that builds social search engines for use on websites, the search engines are called swickis (search+wicki).
	Mahalo	**Mahalo.com** is a web directory (or human search engine) - the project is in beta test. It

Type	Search Engine	Description
		differentiates itself from algorithmic search engines by tracking and building hand-crafted results for searches.
		Rollyo is a Yahoo!-powered search engine which allows users to register accounts and create search engines that only retrieve results from the websites and blogs they want to include in their search results.
		Trexy: Search trails are the click pathways you create while searching and finding information on 4,000+ search engines. Record and share your "search trails". Easier searching of the "deep web".
		Wink: Wink People Search: Over 333,304,647 people on social networks and across the Web. Find people using name search, location, school, work, interests, and more.
International		**Accoona:** A search engine that uses artificial intelligence. In addition to traditional searches, it allows business profile searches, and its signature "SuperTarget" feature. Partnered with China Daily, a large Chinese portal.
		Alleba: Philippines search engine and highly organized directory of Filipino websites.
		Ansearch: Australia/NZ/UK/US. **Ansearch** Ltd is involved in various online media activities, including the **Ansearch**.com.au search engine and the Soush online media network
		Araby: Middle East - Arabic language search engine owned by the Maktoob Group, which owns the world's largest online Arab community; Maktoob.com. (Arabic only)

Type	Search Engine	Description
		**Baidu**: China - The Google of China, **Baidu** is doing what no other Internet company has been able to do: clobbering Google and Yahoo in its home market.
		**Daum:** Korea - Daum is a popular web portal in South Korea which offers many Internet services including search, a popular free web-based e-mail, messaging service, forums, shopping and news.
		**Guruji.com**: India - an Indian Internet search engine that is focused on providing better search results to Indian consumers, by leveraging proprietary algorithms and data in the Indian context.
		**goo**: Japan - an Internet search engine and web portal based in Japan, which crawls and indexes primarily Japanese language websites. goo is operated by the Japanese telecomm giant NTT.
		**Miner.hu**: Hungary - a vertical search engine for searching blogs, videos and other Hungarian content on the internet. Miner.hu indexes about 129.000 blogs.
	 **Najdi.si**	**Najdi.si**: Slovenia - a Slovenian search engine and web portal created by Interseek. It's the most visited website in Slovenia. It uses a technology created by Interseek written entirely in Java
		**Naver:** Korea - The undisputed number 1 search engine in Korea with over 16 million visitors and 1 billion page views per day.
		**Onet:** Poland - Polish language web portal and search.

Type	Search Engine	Description
	onkosh أنكش	**Onkosh**: Middle East - Arabic language search.
	Rambler	**Rambler**: Russia -offers proprietary web search (Rambler Search), e-mail, rating and directory, media, ecommerce and other services to the Russian-speaking websurfer.
	rediff.com	**Rediff**: India - India's leading internet portal for news, mail, messenger, entertainment, business, mobile, ecommerce, shopping, auctions, search, sports and more.
	sapo.pt	**SAPO**: Portugal - Portuguese language search based in Portugal and focused on Portugal.
	[www.search.ch]	**Search.ch:** Switzerland - a search engine and web portal for Switzerland. Founded in 1995 as a regional search engine, later many other services were added: phonebook, SMS service. Acquired by the Swiss Post.
	sesam	**Sesam**: Norway, Sweden - Based in Norway and focused on Norway and Sweden.
	וואלה!	**Walla!:** Israel - Search the web in Hebrew with an Israel focus.
	Яndex	**Yandex:** Russia - Yandex (Russian: Я́ндекс) is a Russian search engine and one of the largest Russian Web portals. Yandex was launched in 1997.
Job	bixee.com step up your job search	**Bixee (India):** Comprehensive jobsearch for India.
	careerbuilder.com	**Career Builder:** The career builder website.
	craigslist	**Craig's List:** is a centralized network of online communities, with free classified ads (with jobs, internships, housing, personals, services, community, gigs, resume, and pets categories)

Type	Search Engine	Description
		and forums.
		**CV Fox:** A search engine that is designed to hunt down and retrieve resumes (CV's) from all over the Internet. Free to use, has become a popular tool with professional recruiters.
		**Dice.com** is the #1 technology job board. For technology experts in areas such as Information Technology (IT), software, high tech, security, biotech, and more. Recently purchased eFinancialCareers.com.
		**Eluta.ca (Canada)** - High-paying jobs in Canada directly from employers' websites. Seach new full-time jobs at 71000+ employers across Canada.
		**Hot Jobs (Yahoo):** Find a job, post your resume, research careers at featured companies, compare salaries and get career advice on Yahoo! HotJobs.
		**Incruit (Korea):** Incruit claims to be the first Korean match making site between job seekers and companies and claims the first Korean Internet résumé database (June 1. 1998).
		**Indeed.com:** A job 'meta-search' that scours job boards, newspapers and multiple sources with one search interface.
		**Jobs.pl (Poland)**: Run by an American/Polish team of MBA's, Poland's leading job portal. Partially owned by European Media Group "Orkla Press" from Scandinavia.
		**JobsDB (Asia/Pacific):** An Asia/Pacific focused job and recruitment site with databases dedicated to each country in the Asia/Pacific

Type	Search Engine	Description
		region.
		**JobPilot (Owned by Monster):** A European job site now owned by Monster.com. Focused on European jobs with branches in a number of European countries.
		**Jobserve**: UK based job search focused originally on IT Contracting work, but now covering multiple areas. Resume database, large number of job postings.
		**Monster.com**: The world's largest resume database and online job search.
		**Naukri.com (India)**: An India-focused job search engine.
		**Recruit.net:** A job search engine that allows you to search jobs worldwide.
		**SimplyHired.com -** Job search engine. Search over 5 million job listings and thousands of jobs sites to find a job you love.
		**StepStone (Europe):** European online recruitment site based in Scandinavia with operations and subsidiaries througout Europe.
		**TheLadders.com (USA)** Job search for professional jobs in the most comprehensive source of $100K+ jobs on the internet.
Legal		**Canadian Law List:** List of Canadian lawyers.
		**Lawyers.com:** Another LexisNexis company
		**FindLaw:** Search **FindLaw's** database of 1,000,000 lawyers to find attorneys in your area. All Topics in FindLaw are geared for the Public, by Subject Area.
		**The Lawyers' List:** Search for lawyers all

Type	Search Engine	Description
		across the United States.
	LexisNexis®	**LexisNexis:** Provider of legal, government, business and high-tech information sources. By subscription only.
	Martindale.com®	**Martindale.com** and LexisNexis, a division of Reed Elsevier Inc.
	Quicklaw™	**LexisNexis** owned portal for searching for lawyers and things legal (Canada)
Maps	géoportail	**Géoportail:** French Geographic portal. French language only.
	Google Maps	**Google Maps:** Provides directions, interactive maps, and satellite/aerial imagery of the United States as well as other countries. Can also search by keyword such as type of business.
	MAPQUEST	**MapQuest (AOL)** was founded in 1967 as Cartographic Services, a division of R.R. Donnelley & Sons & became an independent company in 1994. MapQuest was acquired in 2000 by America Online, Inc.
	MICHELIN	**Michelin (Via Michelin):** The European map specialists' webpage includes standard map features with good European coverage.
	Live Search Maps	**Windows Live Maps:** Enter an address, click enter... be sure to check out "Bird's Eye View". You can see a close-up aerial view of nearly any US Address and many foreign ones. Amazing.
	YAHOO! LOCAL Maps	**Yahoo Maps:** Maps, directions, reverse-directions satellite view but no 'bird's-eye-view'.
Medical	Bioinformatic Harvester	**Bioinformatic Harvester**: From the Karlsruhe Institute of Technology, the Bioinformatic Harvester crawls and crosslinks dozens of

Type	Search Engine	Description
		bioinformatic sites and serves 10's of thousands of pages daily.
	Entrez	**Entrez (Pubmed):** The life sciences search engine.
	EMBL-EBI	**EB-Eye** - EMBL-EBI's (European Bioinformatics Institute)**:** Open-source, high-performance, full-featured text search engine library written entirely in Java. Very fast access to the EBI's data resources.
	GenieKnows	**Genie Knows**: A division of IT Interactive Services Inc., a Canadian vertical search engine company concentrating on niche markets: health search, video games search, and local business directory search.
	gopubmed	**GoPubMed:** Knowledge-based: GO - GeneOntology - Searching sorted - Social network and folsonomy for sciences.
	healia	**Healia:** The health search engine. From the site, "The high quality and personalized health search engine".
	KMLE Medical Dictionary King's Medical Library Engine	**KMLE (King's Medical Library Engine)**: Full American Heritage Stedman's Medical Dictionary comprehensive resource including tens of thousands of audio pronunciations and abbreviation guides.
	MeshPubMed	**MeSH** - Medical Subject Headings (GoPubMed): Knowledge-based.
	Search Medica	**SearchMedica:** Professional Medical Search
	WebMD Better information. Better health.	**WebMD:** A source for health information, a symptom checklist, pharmacy information, and a place to store personal medical information.The leading US Health portal, it

Type	Search Engine	Description
		scores over 40 million hits per month.
MetaSearch	**Brainboost**	**Brainboost:** Now Answers.com. Type in a question in natural language, get an answer.
		**Clusty:** The clustering search engine powered by Vivisimo.
		**Dogpile:** Brings together searches from the top search engines including Google, Yahoo! Search, Live Search, Ask.com, About, MIVA, LookSmart, and more.
		**Excite:** Now an Internet portal, was once one of the most recognized brands on the Internet. One of the famous 90's dotcoms.
		**HotBot** was one of the early Internet search engines (since 1996) launched by Wired Magazine. Now, just a front end for Ask.com and MSN.
		**Info.com:** Metasearch bringing together results from the top search engines.
		**ixquick:** Eliminate Big Brother! The Ixquick metasearch engine permanently deletes all personal search details gleaned from its users. Based in the Netherlands, results come from 11 search engines.
		**Kayak:** Metasearch for travel - search 140 travel sites all at once for the best deals and buy tickets and make reservations direct.
		**Krozilo** is a virtual web browser, similar to My Yahoo!, iGoogle, Pageflakes, Netvibes, and Microsoft Live. Krozilo uses AJAX and DHTML, so does not require installation.
		**Mamma:** "The Mother of All Search Engines" - was one of the web's first metasearch engines

Type	Search Engine	Description
		(1996). Now owned by Copernic Inc. of Montreal, Canada, Mamma.com is a tier 2 search engine.
		**MetaCrawler** is a metasearch engine that blends the top web search results from Google, Yahoo!, Live Search, Ask.com, About.com, MIVA, LookSmart and other popular search engines.
		**MetaLib** is a federated search system developed by Ex Libris. MetaLib conducts simultaneous searches in multiple resources such as library catalogs, journal articles, newspapers and the web.
		**Mobissimo.com** is a travel meta-search website. Like other travel meta-search websites, Mobissimo does not sell directly to the consumer but consolidates travel offerings for a referral fee.
		**Myriad Search:** Ad-free search lets users select results from Ask Jeeves, Google, MSN, and Yahoo! Select search depth and place bias on the search results from the major search engines.
		**Sidestep:** Searches over 200 travel-relates websites for airfares & the best deals on airfare. Find cheap airfares, discount hotels, car rentals and cruise deals to popular travel destinations worldwide.
		**Surfwax** offers a variety of tools for finding, saving, and sharing information on the Internet, including Nextaris, the law-article research site LawKT, the SurfWax meta-search and SurfWax

Type	Search Engine	Description
		Scholar services.
	Turbo10 Search the Deep Net	**Turbo10.com** is a metasearch engine which uncovers information in the Invisible Web. Turbo10 can access information from 800 online databases and searches 10 databases simultaneously.
	WebCrawler	**WebCrawler** was used to build the first publicly-available full-text index of a subset of the Web. WebCrawler® brings users the top search results from Google, Yahoo!, Windows Live, Ask and other popular search engines.
MultiMedia	YouTube	**YouTube:** Owned by Google, the web's largest media site. This search will search through the videos of YouTube only.
	blinkx	**blinkx:** Over 18 million hours of video . Search it all. Blinkx is a multi-media metasearch engine searching the media files of sites such as YouTube, MetaCafe, GoogleVideo, MySpace and more.
	FREE BOOK SEARCH.NET	**FreeBookSearch.net:** The famous book searching portal also searches for audiobooks. This same search will also find MP3 files.
	FindSounds	**FindSounds:** Search engine to find any kind of sound file: WAV, MP3, AIFF, AU - search by sample rate and quality... a great place to find those sound effects.
	metacafe	**MetaCafe:** Search videos hosted by MetaCafe. If you are a producer of videos, you can get paid for videos - the more viewers, the more cash.
	Musgle	**Musgle:** Music Search (mp3, wav, etc.): Based upon a JavaScript that automatically inserts a

Type	Search Engine	Description
		clever boolean search string into Google to return catalogs of hidden MP3 and Music files.
		PBS provides resources to air its standard programming & also provides its audience with multiple online archives of specific video programs. All video archives can be searched for any spoken word pronounced in them.
		Picsearch: Search the web for images. An image search service with more than 2,000,000,000 pictures.
		Podscope: "Introducing: the first search engine that can find podcasts according to the words spoken during them!". Finds audio and video files based upon actual content!
		SpeechBot was a search engine for audio & video. It was created by HP Research, but unfortunately, is now offline.
		Singing Fish: An audio and video search engine, now AOL media search.
		StrimOO: Video search engine. Find videos on Youtube, Metacafe, Dailymotion and more with one search.
		TVEyes: TVEyes makes Radio & TV searchable by keyword, phrase or topic - just as you would use a search engine for text. TVEyes is the first company to deliver real-time TV and Radio search.
		Veveo / VTap: a video search platform for mobile phones. Vtap is an offering from Veveo and it currently works on Apple Iphones as well as Microsoft Mobile-powered phones.
		Web-Cam-Search.com: Search and hack

Type	Search Engine	Description
		nearly a million webcams for free on the net. This search uses Boolean scripting to uncover cams - public & supposedly 'private'. :-)
News	Google News	**Google News:** News by Google. Search and browse 4,500 news sources updated continuously.
	MagPortal.com	**MagPortal:** Find individual articles from many freely accessible magazines by browsing the categories or using the search engine. You can mark articles or find similar articles with several useful tools.
	NEWSLOOKUP.com	**NewsLookup.com:** Search thousands of news sites by source region and media type. News headlines updated continuously.
	LexisNexis®	**LexisNexis:** Provider of legal, government, business and high-tech information sources. By subscription only.
	topix	**Topix** is a news aggregator which categorizes news stories by topic and geography. It was created by the founders of the Open Directory Project. Knight Ridder, Tribune Company and Gannett own 75% of Topix.net.
	YAHOO! NEWS	**Yahoo News**: Use **Yahoo**! **News** to find breaking news, current events, the latest headlines, **news** photos, analysis & opinion on top stories, world, business, politics...
Open Source	**DataparkSearch**	**DataparkSearch Engine** is a full-featured open source web-based search engine released under **the GNU General Public License** and designed to organize search within a website, group of websites, intranet or local system.
	::egothor	**Egothor** is an Open Source, high-performance,

Type	Search Engine	Description
		full-featured text search engine written entirely in Java. It can be configured as a standalone engine, metasearcher, peer-to-peer HUB, etc.
	gonzui:	**gonzui** is a source code search engine for accelerating open source software development - a source code search engine that covers vast quantities of open source codes available on the Internet.
		**Grub** started back in 2000 with a simple concept of distributing part of the search process pipeline: crawling. Their website claims, "We want to help fix search."
		**ht://Dig** is a complete world wide web indexing and searching system for a domain or intranet. ht://Dig is meant to cover the search needs for a single company, campus, or web site.
		The **iSearch** PHP search engine allows you to build a searchable database for your web site. Visitors can search for key words and a list of any pages that match is returned to them.
		Apache **Lucene** is a high-performance, full-featured text search engine library written entirely in Java. Full-text search & cross-platform. Apache Lucene is an open source project available for free download.
		The **Lemur Toolkit** is a open-source toolkit designed to facilitate research in language modeling and information retrieval. Lemur supports a wide range of industrial and research language applications.
		**mnoGoSearch**: Web search engine software.
	Namazu	**Namazu** is a full-text search engine intended

Type	Search Engine	Description
		for easy use. Not only does it work as a small or medium scale Web search engine, but also as a personal search. (Namazu means "Catfish" in Japanese.)
		Nutch is an effort to build an open source search engine based on Lucene Java for the search and index component. The fetcher ("robot" or "web crawler") has been written from scratch solely for this project.
		**OpenFTS**: OpenSource Full Text Search is an advanced PostgreSQL-based search engine that provides online indexing of data and relevance ranking for database searching.
	 **Sciencenet**	**Sciencenet:** For scientific knowledge based on YaCy Technology. Current search engines are based on popularity and/or sponsored links. This makes it difficult for scientists/students/teachers. Sciencenet is the solution.
		**Sphinx** is a free software search engine designed with indexing database content in mind. It currently supports MySQL and PostgreSQL natively. It is distributed under the terms of the GNU General Public License v2.
	SWISH-E	**SWISH-Enhanced** (Simple Web Indexing System for Humans - Enhanced) is a fast, powerful, flexible, free, and easy to use system for indexing collections of Web pages or other text files.
		**Terrier** is software for the rapid development of Web, intranet and desktop search engines.A modular platform for the rapid development of

Type	Search Engine	Description
		large-scale Information Retrieval applications.
	wikia Search	**Wikia Search**: Jimmy Wales and **Wikia** aim to create a an open source Internet **search** engine, to which the community can contribute.
	Xapian	**Xapian** is an Open Source Search Engine Library, released under the **GPL**. It's written in **C++**, with bindings to allow use from **Perl, Python, PHP, Java, Tcl, C#** and **Ruby** (so far!)
	YaCy	**YaCy** is a scalable personal web crawler and web search engine. One YaCy installation can store more than 10 million documents, but in a community of search peers YaCy can provide a search index of unlimited size.
	Zettair	**Zettair** is a compact and fast text search engine designed and written by the **Search Engine Group** at RMIT University. It was formerly known as Lucy.
People	AnyWho	**AnyWho.com** - Part of AT&T, mostly a telephone directory and reverse phone number directory.
	ex.plode.us	**Ex.plode.us**: Explode is an easy way to find friends and those with common interests, no matter what social network or service they use.
	Finding-People.com	**Finding-People.com**: Finding-People.com is the best place to start a people search, as they have a huge number of tools all in one place to find whomever you seek.
	InfoSpace	**InfoSpace:** From their webpage, "The yellow pages and white pages directory from **InfoSpace** is the most convenient way to find people and businesses."

Type	Search Engine	Description
	LinkedIn	**LinkedIn** is a business-oriented social networking site used for professional networking. As of March 2008, it had more than 20 million registered users. An easy way to search for business people or professionals.
	spock	**Spock** advertises itself as, "The world's most accurate people search. Sign up to find people you know."
	wink	**Wink** is a free people search engine that helps you find people at social networks, blogs, and across the Web.
	ZABASEARCH	**Zabasearch:** Honestly free people search. All US postal addresses & telephone numbers revealed free. 3-times more listings than white pages phone directory.
	zoominfo know your stuff.	**ZoomInfo**: Founded in 1999, **ZoomInfo** is a Web-based service that extracts information about people and companies from millions of published resources.
Question & Answer	About.com:	**About.com**. The majority of their results come from their own site. Used to be miningco.com.
	Answers.com	**Answers.com** offers free access to millions of topics from the world's leading publishers.
	Ask	**Ask** Jeeves was designed to allow users to get answers to questions posed in everyday, natural language. Ask.com was the first such commercial question-answering search engine for the Web.
	AskMeNow	**AskMeNow**: Questions answered from your mobile telephone. From their site, "We thought it would be cool if we could get simple answers from our phone anytime, anywhere — so we

Type	Search Engine	Description
		built AskMeNow."
	AskWiki	**AskWiki Beta** is a preliminary integration of a semantic search engine that seeks to provide specific answers to questions using information from Wikipedia articles.
	BrainBoost	**Brainboost:** Now Answers.com. Type in a question in natural language, get an answer.
	eHow	**eHow** is an online knowledge resource with more than 140000 articles and videos offering step-by-step instructions on "how to do just about everything"
	Lexxealpha	**Lexxe** processes natural language queries and delivers results in clusters by topic. Queries can be keywords, phrases or short questions.
	LYCOS iQ beta	**Lycos iQ** is a community driven "human search" site by Lycos Europe GmbH. Users on iQ can post questions and answers in a similar manner to sites such as Yahoo Answers, Google Answers and Wondir.com.
	Powerset	**Powerset** is betting on the wisdom of the crowds with a new online community site called Powerset Labs. The company hopes the site will get people to help build and improve its search engine.
	Windows **Live QnA**	**Windows Live QnA:** Ask any question and get answers from people in the know. Try it. Real answers. A little late to a crowded market, but Windows is there now too.
	YAHOO! ANSWERS	**Yahoo! Answers** is a community-driven knowledge market website launched by Yahoo! that allows users to ask questions of other users and answer other users' questions. Over 60

Type	Search Engine	Description
		million users.
Real Estate		**ForSaleByOwner.com:** Search homes being sold by their owners without the intermediation of realtors - save on commission.
	Home.co.uk	**Home.co.uk:** Comprehensive Property Search for UK houses for sale, estate agents, house prices and guides on buying and selling property and mortgages advice.
		Inman News: Real Estate News search.
		Properazzi.com is an online real estate search engine. Launched in March of 2007 by Yannick Laclau, it allows users to search and view property listings for Europe**.**
		Realtor.com: The official site of the National Association of Realtors. Search listed properties all across America.
		Rightmove: Find property online, search a wide range of property for sale in various areas in the UK, London and Overseas with **Rightmove**.
		Trulia: Find property online, agents can list their properties free, a robust real estate portal for homebuyers and sellers.
		Zillow provides free real estate information including homes for sale, comparable homes, historical sales, home valuation tools and more.
School		**The College Search Engine.com:** Searches the webistes of colleges and universities worldwide, not just the USA. If it is on a university website somewhere, this search engine will find it.

Type	Search Engine	Description
		**Skoolz.org**: Search colleges and universities. Use this search to search only the websites of colleges - to find courses, information, professors, curricula, etc.
		**Google University Search** allows you to search a specific site - one school at a time. The list of schools is comprehensive. Skoolz searches them all at once, Google University Search allows them to be searched one at a time.
Scientific		**Scirus:** The most comprehensive scientific research tool on the web. Over 450 million scientific items indexed at last count. Search journals, scientists' homepages, courseware, pre-print server material, patents, more...
Shopping		**Google Product Search:** (Formerly Froogle) use Google to search for the best deals on products when you are shopping.
		**Kelkoo:** A Yahoo! company. Also powers Yahoo!Shopping in several countries.
		**MSN Shopping: Comparison shopping made easy:** Offering 33,155,627 products from over 8,000 stores — all in one place — and over 470 pages of shopping advice to help you make the right choices.
		**MySimon**: Price Comparison Shopping
		**Nextag** Comparison Shopping. Product directory and search. Shows popular searches - what others are searching for.
		**PriceGrabber.com**: "Comparison Shopping beyond compare" Comparison shopping and search engine.

Type	Search Engine	Description
		**PriceRunner:** Price Comparison website and search engine
		**RetailMeNot:** From the people who brought you "BugMeNot", check here before you buy for discount coupons and promo codes. Why pay retail when you can find coupons at RetailMeNot?
		**Shopping.com:** A shopping directory and search owned by eBay.
		**Shopwiki:** Shopping directory and search cataloguing some 241,416,304 products, and counting...
		**Shopzilla (Owned by Bizrate)** helps shoppers find, compare and buy anything, sold by virtually anyone, anywhere. 20 million unique visitors according to **ComScore**. BizRate reviews stores and products.
		**TheFind.com** is a discovery shopping search engine as opposed to a comparison search. The search database includes over 150 Million products from over 500,000 online stores.
Source Code		**Google Codesearch:** Searches public source code using a variety of parameters.
		**JavaScriptSearch.org** searches for javascripts, ajax, DHTML and JavaScript snippets from all over the web. The fastest way to find a JavaScript. Useful for web developers and webmasters.
		**JExamples** analyzes the source code of Java open source projects such as Ant, Tomcat and Batik and loads them into a java examples database for easy searching. Enter the name of a

Type	Search Engine	Description
		Java API Class and click Search.
	koders	**Koders** Searces some 766,893,913 lines of open source code. Securely searches private source code. Create and share a custom code index that is easily searched from Visual Studio, Eclipse or any browser.
	krugle	**Krugle Code Search Engine** can turn your company's code and related development assets into a searchable, shareable asset.
	PHP Classes	**PHP Classes Repository:** Find the PHP class you need at PHP Classes. The leading PHP site for coders. Everything PHP!
Usenet	Google Groups	**Google Groups:** Formerly Deja News, Google Groups lets you post on usenet forums without using a mail client via their easy-to-use web interface.
Visual Search Engines	grokker	**Grokker** visual Meta Search Engine lets you choose which sites to search and presents the results in multiple views - outline view, map view.
	Kart00	**Kartoo** visual Meta Search Engine searches multiple search engines

4.11 COMPARISON OF PROMINENT SEARCH ENGINES:

Table 4.9 Comparison of Search Engines (Based on Searching criteria)

Search Engines	Boolean	Default	Proximity	Truncation	Fields	Limits	Stop	Sorting
Google Review	-, OR	and	Phrase	No (stems) word in phrase	intitle, inurl, link, site, more	Language, filetype, date, domain	Few, + searches	Relevance, site
Yahoo! Review	AND, OR, NOT, ( ), -	and	Phrase	No word in phrase	intitle, inurl, link, site, more	Language, file type, date, domain	No	Relevance, site
Ask Review	-, OR	and	Phrase	No	intitle, inurl, site	Language, site, date	Yes, + searches	Relevance, metasites
Live Search Review	AND, OR, NOT, ( ), -	and	Phrase	No	intitle, site, loc, url	Language, site	Varies, + searches	Relevance ,site, sliders
Gigablast Review	AND, OR, AND NOT, ( ), +, -	and	Phrase	No	title, site, ip, more	Domain, type	Varies, + searches	Relevance
Exalead Review	AND, OR, NOT, ( ),-	and	Phrase, NEAR	Yes and stems	intitle, inurl, link, site	Language, file type, date, domain	Varies, + searches	Relevance, date

(Source : http://www.searchengineshowdown.com/features/)

Table 4.9.1 Comparison of Search Engines (Based on Searching criteria)

Search Engine	Default Boolean Connector	Other Boolean Connectors Recognized	Proximity Connector	Search Term Limit	Cached Pages	Field Searches	Search Limiters
Google	AND	OR, +, -	AROUND (*n*), " ", *	(previously had been 10 terms)	Yes	domain, intitle, inurl, link, site, et al	date, filetype, language, site, usage rights
Yahoo!	AND	AND, OR, -, ( )	" ", *	unreported (may be unlimited)	Yes	domain, intitle, inurl, link, site, et al	Creative Commons license, language, file type, date, site
Bing	AND	AND, OR, NOT, ( ), &, |, -	" ", *	10 terms	Yes	domain, inbody, intitle, site	feed, language, locaton, site

(source :Features –Search Engine Comparison Chart By Diana Botluk (2004)

Table 4.9.2 Comparison of Search Engines (Based on Searching criteria)

Searching Features								
	AlltheWeb	**AltaVista**	**Google**	**Lycos**	**MSN**	**Teoma**	**Wisenut**	**Yahoo!**
Inclusive Terms	Default	Default	Default	Default	Default	Default	Default	Default
		and						
	Advanced : All of the Words	+	Advanced : All the Words	Advanced : All of the Words		Advanced: Must	WiseSearch: All	Advanced: All
		Advanced: All the Words						
Alternative Terms	OR	OR	OR	OR	OR	OR	not supported	OR
	Advanced :	Advanced:	Advanced : At Least One	Advanced : Any of the Words				Advanced: Any of the

Searching Features								
	AlltheWeb	**AltaVista**	**Google**	**Lycos**	**MSN**	**Teoma**	**Wisenut**	**Yahoo!**
								Words
	or	*Any* on drop down box						
	Any on drop down box							
		OR in Boolean box						
Phrases	Quotes	Quotes	Quotes	Quotes	Quotes	Find this Phrase checkbox	Quotes	Quotes
	Advanced: phrase on drop down box	Advanced:	Advanced:	Advanced: Exact Phrase	Advanced: Exact Phrase		WiseSearch: Exact Phrase	Advanced: Exact Phrase
		phrase	*phrase*					
Exclusion	- (minus sign)	- (minus sign)	- (minus sign)	- (minus sign)	Advanced: *AND NOT* when using a Boolean expression	- (minus sign)	- (minus sign)	Advanced: none
	Advanced:	NOT	Advanced:	Advanced:		Advanced: must not	WiseSearch: without	
	andnot		*without*	*None of the Words*				
	not include on drop down box (Filters)	Advanced: NOT in Boolean box						
Truncation	no		Automatic stemming in some instances	no	Enable word stemming on advanced pg	no	no	no
Search by Levels	yes	no	yes	yes	no	only with suggested refinements	no	no

Searching Features								
	AlltheWeb	**AltaVista**	**Google**	**Lycos**	**MSN**	**Teoma**	**Wisenut**	**Yahoo!**
Restrictors Search by Fields	language, domain, IP address,	date, file type, location	domain, language, date, page level, file format, occurences	domain, language, title, url	region, language, domain, page level, file type, media type	title, url, language, domain, region, date	no	date, site, domain, country, language, file format
	file format, date.							
		Will support the following prefixes:	Supports the following prefixes:			Will support the following prefixes:		
	Will support the following keyword prefixes:	domain:	intitle:			intitle:		
	site:	host:	allintitle:			inurl:		
	url:	link:	site:			geoloc:		
	link:	title:	inurl:			site:		
	title:	url:	filetype:			before date:		
						afterdate:		
			Putting ~ before a word searches for synonyms			betweendate:		
			Search for numeric range by placing two periods between numbers					

4.12 SEARCH ENGINES BASED ON FEATURES:

Table 4.10 Comparison of Search Engines Based on Features

Search Engine	**Google www.google.com**	**Yahoo! Search search.yahoo.com**	**Exalead www.exalead.com/search/**
Links to help	**Google help**	**Yahoo! help**	**Exalead help**
Size, type	IMMENSE. Size not disclosed in any way that allows comparison. Probably the biggest.	HUGE. Claims over 20 billion total "web objects."	LARGE. Claims to have over 8 billion searchable pages.
Noteworthy features	PageRank™ system includes hundreds of factors, emphasizing pages most heavily linked from other pages. Many additional databases including Book Search, Scholar (journal articles), Blog Search, Patents, Images, etc.	Shortcuts give quick access to dictionary, synonyms, patents, traffic, stocks, encyclopedia, and more.	Truncation lets you search by the first few letters of a word. Proximity search lets you find terms NEAR each other or NEXT to each other. Thumbnail page previews. Extensive options for refining and limiting your search.
Phrase searching what's this?	Enclose phrase in "double quotes".	Enclose phrase in "double quotes".	Enclose phrase in "double quotes".
Boolean logic what's this?	Partial. AND assumed between words. Capitalize OR ( ) accepted but not required. In Advanced Search, partial Boolean available in boxes.	Accepts AND, OR, NOT or AND NOT. Must be capitalized. ( ) accepted but not required.	Partial. AND assumed between words. Capitalize OR. ( ) accepted. See Web Search Syntax for more options.
+Requires/ -Excludes what's this?	- excludes "" requires an exact word or phrase	- excludes + will allow you to search common words: "+in truth"	- excludes + retrieves "stop words" (e.g., +in)
Sub-Searching what's this?	The search box at the top of the results page shows your current search. Modify this (e.g., add more terms at the end.)	The search box at the top of the results page shows your current search.	The search box at the top of the results page shows your current search. Modify this (e.g., add more terms at the end.)

Search Engine	**Google** **www.google.com**	**Yahoo! Search** **search.yahoo.com**	**Exalead** **www.exalead.com/search/**
Links to help	**Google help**	**Yahoo! help**	**Exalead help**
		Modify this (e.g., add more terms at the end.)	
Results Ranking what's this?	Based on page popularity measured in links to it from other pages: high rank if a lot of other pages link to it. Fuzzy AND also invoked. Matching and ranking based on "cached" version of pages that may not be the most recent version.	Automatic Fuzzy AND.	Popularity ranking emphasizes pages most heavily linked from other pages.
Field limiting what's this?	link: site: intitle: inurl: Offers U.S.Gov't Search and other special searches. Patent search.	link: site: intitle: inurl: url: hostname: (Explanation of these distinctions)	intitle: inurl: site: after:[time period] before:[time period] (For details, click on "Advanced search")
Truncation, Stemming (what's this?)	No truncation within words. Automatically stems some words. Search variant endings and synonyms separately, separating with OR (capitalized): airline OR airlines Use * or _ as wildcards substituting for initials or words: sickle * anemia george _ bush	Neither. Search with OR as in Google.	Use * example: message*
Language	Yes. Major Romanized and non-Romanized languages in Advanced Search.	Yes. Major Romanized and non-Romanized languages.	Extensive language and geographic options. Use "Advanced Search".

Search Engine	**Google www.google.com**	**Yahoo! Search search.yahoo.com**	**Exalead www.exalead.com/search/**
Links to help	**Google help**	**Yahoo! help**	**Exalead help**
Translation	Yes, in "Translate this page" link following some pages. To and sometimes from English and major European languages and Chinese, Japanese, Korean. Uses its own translation software with user feedback.	Available as a separate service.	Yes, in "Translate this page" link following some pages.

(Source:ttp://www.lib.berkeley.edu/TeachingLib/Guides/Internet/SearchEngines.html)

Table 4.10.1 Comparison of Search Engines Based on Features

Results Display Features								
	AlltheWeb	**AltaVista**	**Google**	**Lycos**	**MSN**	**Teoma**	**Wisenut**	**Yahoo!**
Integrated Directory Results	no	Tab at top	not integrated	not integrated	a few featured sites, depending on search	no, but provides suggested sites for your search	sort of – categories appear with results, but these don't lead to a directory, just suggested searches with abridged results	yes
Directory		Open Directory	Open Directory	Open Directory	MSN			Yahoo
Customized	*Customize*	*Settings*	*Preferences*	only slightly using Advanced	*My Preferences*	slightly in *Preferences*	*Set Preferences*	*Preferences*

Results Display Features								
	AlltheWeb	**AltaVista**	**Google**	**Lycos**	**MSN**	**Teoma**	**Wisenut**	**Yahoo!**
Clustered / Compressed	yes	yes	yes	not apparent	Can be toggled on Advanced Search page	yes	yes	yes
Suggested Searches/ Refinements	no	yes	no	yes – *Narrow Your Search*	no	yes	WiseGuide	yes – *Related* directly under search box
Similar Searches	no	no	yes – *Similar Pages*	no	no	no	no	no
Other Notable Features	Use *Customize Preferences* to personalize a wide variety of features	Translates results	Cached results			Will open results in a second window if preferences are set that way	Sneak-a-Peek opens a small box with results page right in the middle of results list	Will open results in second window
			Will open results in second window if preferences are set that way					Cached results

Results Display Features								
	AlltheWeb	**AltaVista**	**Google**	**Lycos**	**MSN**	**Teoma**	**Wisenut**	**Yahoo!**
			Translates results					

Conclusion:

Different Search engines for different purpose and subjects are available and users have to identify the search engines of their interest. This chapter covered different serach engines with their features and searching techniques used in them. This is a very useful compilation and comparison for all the users irrespective of any subject.

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    a. (http://www.lib.berkeley.edu/TeachingLib/Guides/Internet/SearchEngines.html)
9) Google is currently the most used search engine. It has one of the largest databases of Web pages, including many other types of web documents like **blog** posts, **wiki** pages, **group** discussion threads and document formats, **PDFs**, Word or Excel documents, Power Points etc. Despite the presence of all these formats, Google's **popularity** ranking often places worthwhile pages near the top of search results.
10) Google alone is not always sufficient, not everything on the Web is fully searchable in Google. **Overlap studies** show that more than 80% of the pages in a major search engine's database exist only in that database. For this reason, getting a "second opinion" can be worth your time. For this purpose, **Yahoo! Search** or **Exalead** are useful. use of **meta-search engines** as primary search tool is generally not recommend.
11) http://wn.com/comparison_of_web_search_engines You Tube explanation
12) http://www.searchenginesworldwide.net/search/list.html worldwide search engines

CHAPTER-V

SEARCH ENGINES : FOR SUBJECTS AND LIBRARIES AND INFORMATION CENTRES AND LIBRARIES

CHAPTER-V

SEARCH ENGINES : FOR SUBJECTS AND LIBRARIES AND INFORMATION CENTRES AND LIBRARIES

5.1 INTRODUCTION:

Librarians adapted internet technology as well as different technologies from time to time to achieve economy, providing fast services to users. Internet is searched using different search engines. The Internet has emerged as one of the most powerful tools for global communication. The Library and Information Science (LIS) professional has a vital role to play in supplying the relevant information to the right user at the right time in the right form. The volume of information on the Internet is growing exponentially and it is being regularly updated with the latest information from all fields. In the 21st Century, the Internet has become one of the reference tools for all libraries(Batthini and Madani 2003)

According to Wempen Faithe (1998), beginners complain about the vastness of Internet. There are millions of pages all over the world, and Information Professionals are not going to stumble onto the information they need by just clicking on links. It is highly frustrating that there is not one comprehensive index, like in the back of the book, where they can just look things up. There is not single master index, but there are several very good partial indexes, and in many cases LIS professionals will find more information than they need by using only one of them. That means, the partial indexes are nothing but search engines. With a search engine, LIS professionals type in what they want to search for, and the system consults an index of the web and pulls up addresses of all pages that match their search. Each search engine is a little different from others. The basic procedure for using each one is the same. However while performing advanced searches using complicated stuff, like entering complex search criteria, each search engine has its own rules. Search engines use bots or spiders that travel through the Internet, constantly checking out the sites and recording information for their masters. The bots/spiders make a note of the page's address and key words, and send it back home for inclusion in the index.

Development 'Web Search Engine', or simply search engines, has just crossed the state of a currency and there have been significant developments during the past decade. This subject or area is growing up exponentially in the Universe of Knowledge as it provides information to all users on the net and use of web pages and related information.

Search engines do just provide users a guided tour of the net, but providing access to valuable information, links to databases and many knowledge resources. In short provider of the most valuable information available in world today. Hence web search engines are naturally, have become as popular as the Internet. A large number of users go on surfing web sites via search engine every second. Librarians and Library users are also following the same practices in collecting the information.

5.2 TYPES OF SEARCH ENGINES AND THEIR UTILITY:

(http://liblearn.osu.edu/guides/searchengines.html)

In the following tables some of the useful search engines for different subjects are listed. They are very helpful in gathering subject based information.

5.2.1 Search Engines: General Information Searching

In the area of Library and Information Centers few general search engines are useful along with general purpose search engines. Few search engines covers everything and all the areas are covered.

Table 5.1 Search Engines Useful for General LIS Use

Yahoo	**:**	This search engine has been around for many years and is one of the most widely used.
Google	**:**	The most widely used search engine.
Duck Duck Go	**:**	Lists options when search terms have multiple meanings.
Kosmix	**:**	Divides results by categories, laid out with thumbnails.
Yebol	**:**	Results laid out in a tree diagram by category - or specify desired categories before searching.
Bing	**:**	Microsoft's latest attempt at a search engine.

5.2.2 Metasearch Engines:

Table 5.2 Meta Search Engines Useful for General LIS Use

Meta crawler	**:**	Searches multiple other search engines and brings the top results. Search by category and see recommended searches.
Dog pile	**:**	An early metasearch engine. Allows for searching by multiple categories.
Yippy	**:**	Formerly Clusty. Search and see results by multiple "clouds."
Web crawler	**:**	One of the first search engines. Now exists as a metasearch engine.
Leap fish	**:**	Categorized results and an interesting results navigation
Mamma	**:**	One of the first metasearch engines. Search categories and view suggested searches.

5.2.3 Search Engine Useful for Science Users:

Table 5.3 Search Engines : Science

Scirus	**:**	Searches multiple scientific and scholarly sites. Covers most science areas.
Science.gov	**:**	Search multiple science-oriented government web sites. Covers most science areas.
Vadlo	**:**	Covers biomedical and life sciences.
eTBLAST	**:**	Enter a string of text (several paragraphs possible) from a work and find similar results. Search may take some time. Focus is largely medical.
Quertle	**:**	Search for Biomedical information, including journal literature.
GoPubMed	**:**	Search for medical information. Search includes links to definitions, Wikipedia articles, statistical information on results, and more.
NovoSeek	**:**	A biomedical search engine for journal literature. Contains a useful filter option for results.

NextBio	**:**	Search for biological information, including clinical trials, news, data and journal literature.
GEOindex	**:**	Search for geological and environmental information.
AgriSurf	**:**	Search the top agricultural web sites.

5.2.4 Search Engines : Useful for Social Science users:

Table 5.4 Search Engines : Social Science

Intute	**:**	Focuses searches on specific sites. Covers many subject areas. Strong focus on British web sites.
Economics Search Engine	**:**	Custom Google search engine focusing on 23,000 economics web sites.
SearchGov.com	**:**	Search U.S. government (federal, state, local) web sites.
LawCrawler	**:**	Search the web and databases for legal information.
Biznar	**:**	Search the deep web for business information.
Business.com	**:**	A search engine designed to help businesses make purchasing decisions.
ThomasNet	**:**	Search for product, company, or brand information. Also browse by over 67,000 categories.
Research Resources for the Social Sciences	**:**	Find resources on social sciences topics.
Education Planet	**:**	Search for or browse information on education topics.
Education World	**:**	Search for education topics. Includes lesson plans.
ZPID PsychSpider	**:**	A psychology-specific search engine that includes data, tests, and also MEDLINE information.
Social Psychology Network	**:**	Search thousands of psychology-specific sites. browse or limit searches to specific topics.

5.2.5 Search Engine: Useful for Arts & Humanities Users:

Table 5.5 Search Engines : Arts & Humanities Users

The First Person	**:**	Search personal letters, diaries, or narratives.
Yahoo! Music	**:**	Search for musical information. Includes videos, lyrics, news, and more.
Grooveshark	**:**	Listen to free music online. Search for artists, albums, or specific songs. Includes many genres, including ranging from classical to television theme songs.
Playlist.com	**:**	Search for and listen to free music online. Share playlists on social networking sites.
Artcyclopedia	**:**	Search for fine art information. Search artists, work titles, or by museum names/locations.
VADS	**:**	Search for visual art images (paintings, photographs, posters, sculptures, and more.
History Engine	**:**	Find information on a wide variety of U.S. history topics. See summaries, links to resources, courses at a variety of colleges/universities, maps, and more.
Footnote	**:**	Search for and share documents on U.S. history topics. Currently over 67 million items digitized.
American Memory	**:**	Search the Library of Congress's American Memory Collections for information on U.S. history.

5.2.6 Format-Specific Search Engines

Many search engines have video, audio, and image search options or limits. Some overlap may occur with the formats in search engines noted below. The list of music resources in Arts & Humanities is also available over the net and specific search engines are available for this.

5.2.6.1 Data:

Wolfram Alpha	**:**	Search for topics and get data on them. Compare multiple topics using A v. B format.
ICPSR	**:**	Find social science data.
The Datasets Search Engine	**:**	A custom search engine to find datasets on a wide range of topics.

5.2.6.2 Images:

picsearch	**:**	Search over 3 billion pictures on the web.
TinEye	**:**	A reverse image search - upload an image and see where it or other versions can be found.
Pixsy	**:**	Search images and videos.

5.2.6.3 Video:

TubeSurf	**:**	A video metasearch site.
blinkx	**:**	Search over 35 million hours of video, including music, television, and more.
Truveo	**:**	Search or browse videos in multiple categories.

5.2.6.4 Audio:

FindSounds	**:**	Search for a wide range of sounds in multiple formats.
podscope	**:**	Search for podcasts (both audio and video).
Kazaa	**:**	Search for and download music.

All the search engines are not very useful to find academic research papers, scholarly articles nor primary sources.

5.2.7 Academic Search Engines (Libraries):

The following 20 useful specialty search engines can help to find those resources quickly for academic content. They also cover from simple searches to libraries and on to archives (Bass 2011)

1) **Academic Index**: This is simple search engine to find topics in other search engines such as Infotopia, Infomine, Bielefeld Search Engine, Open Doar and Chabot College. Extend the search to encompass even more search engines previously selected by librarians, teachers and library and educational consortia. This academic search engine was created by and is maintained by Dr. Michael Bell, former chair, Texas Association of School Librarians. He also created and maintains Infotopia.

2) **BASE**: Bielefeld Academic Search Engine is one of the world's most voluminous search engines especially for academic open access web resources. BASE is operated by Bielefeld University Library.

3) **CiteSeerx**: This is a scientific literature digital library and search engine that focuses primarily on the literature in computer and information science. CiteSeer was the first digital library and search engine to provide automated citation indexing and citation linking using the method of autonomous citation indexing.

4) **Google Scholar Beta:** From one place, anyone can search across many disciplines and sources like articles, theses, books, abstracts and court opinions, from academic publishers, professional societies, online repositories, universities and other web sites. Google Scholar helps to find relevant work across the world of scholarly research.

5) **InfoMine**: Search this virtual library of Internet resources relevant to faculty, students, and research staff at the university level. Librarians from the University of California, Wake Forest University, California State University, the University of Detroit – Mercy, and other universities and colleges have contributed to building InfoMine. It contains useful Internet resources such as

databases, electronic journals, electronic books, bulletin boards, mailing lists, online library card catalogs, articles, directories of researchers, and many other types of information.

6) **ipl2**: In January 2010, the website "ipl2: information can trust" was launched, merging the collections of resources from the Internet Public Library (IPL) and the Librarians' Internet Index (LII) websites. The site is hosted by Drexel University's College of Information Science & Technology, and a consortium of colleges and universities with programs in information science are involved in developing and maintaining the ipl2.

7) **iSeek**: This is a targeted search engine that compiles hundreds of thousands of authoritative resources from university, government, and established noncommercial providers. It provides time-saving intelligent search and a personal Web-based library to help you locate the most relevant results immediately and find them quickly later.

8) **refSeek**: Currently in public beta, RefSeek is a web search engine for students and researchers that aims to make academic information easily accessible to everyone. RefSeek searches more than one billion documents, including web pages, books, encyclopedias, journals, and newspapers.

9) **Vadlo**: This search engine holds the keys to everything scientific, including information about ELISA and other immunoassays, biomarkers, drug discovery and biotech high-throughput screening bioassays, clinical trials and R&D, RNA interference, microRNA, miRNA, shRNA, siRNA oligoneucleotide, real time multiplex PCR primers and more…

5.2.7.1 Web, Library and Literary Tools:

1) **Digital Library of the Commons**: The Digital Library of the Commons (DLC) is a gateway to the international literature on the commons. The DLC provides free and open access to full-text articles, papers, and dissertations. This site contains an author-submission portal, an image database, the

comprehensive bibliography of the Commons; a keyword thesaurus and links to relevant reference sources on the study of the Commons.

2) **Directory of Open Access Journals**: This service covers free, full-text, quality controlled scientific and scholarly journals. They aim to cover all subjects and languages through over 6313 journals in the directory. Currently 2746 journals are searchable at article level. Over 538958 articles are included in the DOAJ service.

3) **ERIC**: The Education Resources Information Center is an online digital library of education research and information. ERIC is sponsored by the Institute of Education Sciences (IES) of the U.S. Department of Education. ERIC provides ready access to education literature to support the use of educational research and information to improve practice in learning, teaching, educational decision-making, and research.

4) **Intute**: Intute is a free online service that helps to find web resources for studies and research.

5) **Open Library:** This group has gathered over 20 million records from a variety of large catalogs as well as single contributions, with more on the way. Open Library is an open project: the software is open, the data are open, the documentation is open, and they welcome your contributions.

6) **The Literary Encyclopedia**: The Literary Encyclopedia is an authoritative collection of specially commissioned articles written by scholars expert in their fields. It addresses literary works, writers, cultural movements and historical events around the world. Its interactive features enable the user to place literature within its historical context in innovative ways.

7) **WorldCat:** This search tool lets browse the collections of libraries in your community and thousands more around the world for popular books, music CDs and videos. One can also discover many new kinds of digital content, such as downloadable audiobooks. WorldCat.org lets you find an item of interest and then locate a library near to you that owns it.

5.2.7.2 Archives:

1) **Archives Hub**: Use the Hub to instantly scan the archival landscape and bring together diverse sources held in over 200 repositories across the UK. Historians find the Hub an essential tool for their research. Postgraduate students can bring that extra unique something to their research. Educators can take advantage of the Hub to introduce students to primary sources for their coursework.

2) **British Library Research Archive**: The British Library Research Archive is a database of papers and articles by British Library staff. It also contains papers by readers who have used the Library's collections in their research and who do not have any institutional affiliation or access to another institutional repository. Papers from conferences organized and hosted by the British Library may also be included. The goal of the Archive is to provide free and full access to these materials, and to capture and preserve research that might otherwise be lost.

3) **Library of Congress**: The Library of Congress is the nation's oldest federal cultural institution and serves as the research arm of Congress. It is also the largest library in the world, with millions of books, recordings, photographs, maps and manuscripts in its collections. Use the online site to find archived materials from across the world, but specifically for America from its founding to current documents.

4) **National Archives**: This link leads to ARC, the Archival Research Catalog for this nation's national archives. Not all finding aids and images on the NARA web site are currently described in ARC yet, although that is the goal. An updated version of Guide to Federal Records in the National Archives of the United States can be searched on the NARA web site to identify records of interest. One can visit to the Gateway for Educators and Students to find more resources.

5.3 TIPS FOR BETTER SEARCHING USING SEARCH ENGINES:

The following tips might enhance search capabilities:

1) Select the terms thoughtfully to get the least result
2) Use truncation or wild cards while searching data to get more similar records
3) Use Boolean terms while searching
4) Put quotation marks around phrases and also use parentheses to group terms together while searching
5) Make use of advance search facilities to get appropriate results
6) Use different search engines and collect the data, do not rest on single search engine output.
7) Google is used extensively but Yahoo, Bing, Ask, Dogpile are also used
8) Be more specific while searching
9) Use own words while searching information using search engines
10) Try meta search engine
11) Select proper search engine
12) Bookmark sites of your location.

5.3.1 Types of Search Queries*:*

Andrei Broder ( ) who noted and identified the types of search queries, generally used by the searchers while searching information grouped in to three types. The most searches arecategorised into the following 3 categories:

a) **Informational** - seeking static information about a topic
b) **Transactional** - shopping at, downloading from, or otherwise interacting with the result
c) **Navigational** - Connect to a specific URL

5.3.2 Improve Searching Skills:

For becoming a better searcher the search engines offer:

- **Advanced search pages** which help searchers refine their queries to request files which are newer or older, local or in nature, from specific domains,

published in specific formats, or other ways of refining search, for example the ~ character means related to Google.

- **Vertical search databases** which may help structure the information index or limit the search index to a more trusted or better structured collection of sources, documents, and information.

Since early search algorithms did not do adequate link analysis or cache full page content if you did not know the exact name of what you were looking for it was extremely hard to find it.

5.4 FEDERATED SEARCH (ing):

Federated search is an information retrieval system or technology that allows the simultaneous search of multiple searchable resources. A user makes a single query request which is distributed to the search engines participating in the federation. The federated search then aggregates the results that are received from the different search engines for presentation to the user. Federated search meets the need of searching multiple disparate content sources in single query. This allows users to search multiple databases at once in real time, arrange the results from the various databases into useful form and then present the results to the users for applications. Peter Jacso (2004), defined the term federated searching, which consists of (1) transforming a query and broadcasting it to a group of disparate databases or other web resources, with the appropriate syntax, (2) merging the results collected from the different databases, (3) presenting them in a succinct and unified format with minimal duplication, and (4) providing a means, performed either automatically or by the portal user, to sort the merged result set.

Federated search is also known as parallel searching, meta-searching or broadcast searching.

Federated searching aggregates multiple channels of information into a single point. (Fryer 2004, p.34). This in itself reduces the time spent by the end user and librarians, in searching for information. It usually displays results in a common format. This provides the information in a ‘unified’ manner through one seamless gateway. Library

users and librarians, then have the option of choosing which database they wish to continue to perform more 'in-depth searching' in.
Some major players in the development of federated search engines are, Muse Global (Muse Search), Fretwell-Downing (Zportal), Webfeat (Knowledge Prism), H.C.N.'s U.S.E. (Unified Search Environment) and many more. These products offer users access to multiple databases, through one search interface. Melbourne University is in the process of implementing a federated search solution called CoSI, (Common Search Interface) in order to provide cohesive access to their electronic resources. http://www.lib.unimelb.edu.au/metalib/metalib01.html

According to Schwarzwalder (2000, p.73) "(rather) than an explosion in information we have had an explosion in access". In the library space, federated search evolved from the 'broadcast search', which involved Z39.50 protocol. Libraries moving beyond virtual on-line catalogues, gave the ability to include subscription databases, the Internet and virtually anything in the electronic arena via authentication.

Meta search, federated search, cross-searching of databases, parallel search, single search and broadcast search are terms that describe the current trend of offering simultaneous searching of multiple e-resources. Meta search offers simple and advanced search options. When a user submits a query to a Meta search system, it broadcasts it to heterogeneous information resources simultaneously. Even though Z39.50 protocol and compatibility exists, the Meta search system must make adjustments so that the databases search engine will make the relevant adjustments to produce appropriate answers to the query put forward. The algorithm displays the best results first. The process is in two stages. It delivers the query and obtains the number of hits, along with a reference to the result list.

Dialog, Lexis Nexis and Ovid are some of the database providers, provide cross database searching within their collections for some time now. Z39.50 protocol or standard was established in 1988 in order to offer a similar solution across library catalogues. Since Z39.50 was established prior to the web, it is difficult to use by the Industry, and is not flexible for web protocols that are now available. Not all resources can be set up for Meta searching. Some use Z39.50 protocols, others web HTTP protocol and some XML, and yet others leave it to the meta-search vendor, to

determine their methodology. Meta searching can be slow due to IP validation, filtering through a proxy server across resources both in-house and to external servers. A historical perspective on the precursors to federated searching shows us that we have travelled a long way from the 1970's through to the 1990's. We've experienced and used and inflicted upon our users – multiple hard copy volumes and indexes, acoustical modems, desktop access via the growth and development of PC's in the early 1980's, CD ROM's in the mid 1980's, and by the mid 1990's databases were making a migration to the Internet. (Schwarzwalder2000, p.73-75).

Todd Miller – founder of Webfeat (Miller 2004, p32) makes these observations that the Internet and Google are synonymous. Google is the 'black box' to information on the Internet, providing simultaneous searching of millions of resources in a convenient user friendly way. A 'one-stop-shop' for information retrieval.
According to Sadeh (2004) p.1-12 "all things being equal" it is better to search one place than several.

Amazon.com is yet another example on the Internet of a de facto catalogue for the masses. As Librarians, information managers, custodians and disseminators of information, we need to keep one step ahead of this trend along with our users expectations.

As 'librarians', 'information managers', and 'knowledge managers' we have also evolved in our 'titles' and roles as custodians and disseminators of information. We live in the age of information explosion. The imminent need to access, retrieve and disseminate information in a quick, functional, user-friendly manner has in itself created the need for a system or systems whereby this may be achieved. We live in a world where 'instant', 'immediately' and 'now' are hidden adjectives in the way we operate as humans in all walks of life, or seek to at any rate. The sheer fast - lane and super highways that we travel on, has necessitated the invention and evolution of systems to match our lifestyles, expectations and business. The volume of information and the technology that is now available to us makes this a reality.

"Knowledge is power and this is true for library patrons and libraries. The more librarians and libraries can fully engage their information, the more central they

become in the lives of their constituencies. According to Sen. Wendell Ford "If information is the currency of democracy, then libraries are the banks." (Miller 2004, p.32).

The problem is that our information repositories have been made far too secure, with archaic information management and navigation tools, which unwittingly insulate our users from their vast intellectual currency. The paradox so elegantly demonstrated via Google is, that the most powerful information access approach, also happens to be the simplest and easiest. The most complex and least intuitive interfaces wind up 'securing information' not 'facilitating information access'.

5.4.1 Process:

Federated search portals, either commercial or open access, generally search public access bibliographic databases, public access Web-based library catalogues (OPACs), Web-based search engines like Google and/or open-access, government-operated or corporate data collections. These individual information sources send back to the portal's interface a list of results from the search query. The user can review this hit list. Some portals merely screen scrape the actual database results and not directly allow user to enter the information source's application. More sophisticated ones de-dupe the results list by merging and removing duplicates. There are additional features available in many portals, but the basic idea is the same: to improve the accuracy and relevance of individual searches as well as reduce the amount of time required to search for resources.

This process allows federated search some key advantages when compared with existing crawler-based search engines. Federated search need not place any requirements or burdens on owners of the individual information sources, other than handling increased traffic. Federated searches are inherently as current as the individual information sources, as they are searched in real time.

One application of federated searching is the meta-search engine; but this is not a complete solution as many documents are not currently indexed and are on deep Web, or invisible Web. Many more information sources are not yet stored in electronic form also. Google Scholar is one example of many projects trying to use

this search engine. When the search vocabulary or data model of the search system is different from the data model of one or more of the foreign target systems the query must be translated into each of the foreign target systems. This can be done using simple data-element translation or may require semantic translation.

5.4.2 Challenges in Using Federated Search:

A challenge faced in the implementation of federated search engines is scalability, i.e. the performance of the site as the number of information sources comprising the federated search engine increases.

Federated search engines, or discovery tools, is a popular new technology for library websites.

5.4.3 Examples of Federated Search Engines:

One federated search engine that has begun to address this issue is WorldwideScience, hosted by the U.S. Department of Energy's Office of Scientific and Technical Information. WorldWideScience (http://worldwidescience.org/) is composed of more than 40 information sources, several of which are federated search portals themselves. One such portal is Science.gov (http://www.science.gov/) which itself federates more than 30 information sources representing most of the R&D output of the U.S. Federal government.

Another application Sesam running in both Norway and Sweden has been built on top of an open sourced platform specialised for federated search solutions. Sesat,(http://sesam.no and http://sesam.se) acronym for Sesam Search Application Toolkit, is a platform that provides much of the framework and functionality required for handling parallel and pipelined searches and displaying them elegantly in a user interface, allowing engineers to focus on the index/database configuration tuning.

5.4.4 Federated Searching and Libraries:

Libraries in this ‘cyber age’ provide access to a variety of databases in a variety of disciplines. Federated search engines have emerged in order to provide a far - reaching service to our end users viz. ‘unifying’ and providing ‘cross searching’ of

databases and information. This saves valuable time by bridging the gap between ‘searching’ and ‘acquiring’ relevant information in a timely fashion.

5.5 SELECTION OF SEARCH ENGINE:

Search engines that help to find whatever some one is looking for. If user know the kind of information that is required web assist user in identifying good web search engines to use. (http://www.philb.com/whichengine.htm)

5.5.1 Keyword Search Engines:

Search with some key words or phrases or access terms

- **Google** is always a good bet, since it has the largest index
- **Yahoo Search** is the second most popular keyword search engine
- **Bing** may provide results if the other two don't work
- **Exalead** is an excellent choice and makes a change from the big 3
- **SearchLion** covers Web, images, news, video, blogs, twitter. Nice and easy.
- **WebNocular** It's your bog standard web search engine, which covers web, image, video, news, blogs, wikis, childrens and so on.

5.5.2 Index or Directory based search engines:

These search engines arrange data in hierarchies from broad to narrow.

- **Yahoo Directory** provides 14 main categories
- Virtual libraries from **Pinakes**. Drill down for the content/sites you need
- **The Open Directory Project** provides access to 16 main categories

5.5.3 Multi or Meta search engines:

These search engines are useful when need to run a comprehensive search quickly across a number of different engines, to compare results or to suggest search engines that may not have tried before. The majority do a Google, Yahoo, MSN, Ask search (GYMA, or GYM search depending), but there are differences.

- **Browsys** 18 search engine options. Formerly intelways

- **Forelook** for Google, Bing, Delicious, Flickr, YouTube, Twitter, Facebook, Wolfram
- **Goofram** for Google and Wolfram Alpha
- **Heapr** for Google, Twitter, Wolfram Alpha, Wikipedia
- **Ixquick** has a nunber of UK based engines in its collection
- **Izito** 6+ standard free text search engines used
- **Joongel** 10 engines in multiple categories
- **Kedrix** Provides options for Bing, Yahoo, Twitter, Indian and Chinese engines.
- **Mamma** been around for ever, good reputation
- **MyAllSearch** You can choose from Google, Yahoo, Bing, Ask (Jeeves), Yandex, Lycos, Metacrawler, Entireweb and DuckDuckGo.
- **Nginer** covers various types of search and engines. Framed results
- **Scour** GYM search, + vote and comment on results
- **Search!o** wide variety of different engines; 10 in total
- **Searchboth** Compare 2 search engines at once, eight options
- **Searchzooka** allows for complex searches across 7 different engines. Worth a look.
- **Sputtr** has 7 categories.
- **Soovle** for Google, Wikipedia, Answers, YouTube, Ask, Yahoo, Amazon
- **Symbaloo** visual and multi engine, add your own engines as well.
- **Trovando** is a first rate choice and a personal favourite. 33 options
- **Whonu?** Wide variety of resources, lots of options, impressive
- **Zuula** 11 different search engine options

5.5.4 Visual results search engines:

Rather than a simple textual list of results some search engines provides content in a **v**isual format. These engines also appeal to students and children.

- **Allplus** uses a cluster graph
- **Cluuz** provides network results
- **hashtagify.me** This is a nice little search feature for hashtags on Twitter.
- **oSkope** uses Amazon, ebay and Flickr images displayed as thumbnails

- **Quintura** is an engine offering a tag cloud based on results
- **RedZ** provides an arc of webpages you can flick through
- **Search-cube** uses a cube of thumbnails
- **Simploos** The method of displaying webpages is by horizontal scrolling, with an automatic sliding to make it simple to the searchers.
- **Spacetime** is like RedZ but larger thumbnails
- **TouchGraph** for Google
- **WebBrain** displays a visual representation above, and links below
- **Yometa** takes the results from Google, Yahoo and Bing and displays them in a Venn diagram

5.5.5 Category search engines:

Some search engines creates categories to narrow or expand search criteria. This is good if user don't want to think, or need some help in areas that don't know that well.

- **Ask** suggests different categories
- **Carrot Clustering** is an engine which provides options in various categories
- **Exalead** has related term suggestions and other methods of narrowing your results
- **Gigablast** provides some suggested terms/phrases
- **Google sets** creates terms from a few examples
- **iSeek** provides topics, people, places, organisations, dates etc as categories.
- **iZito** provides topics to narrow a search
- **Yippy,** formally Clusty. Clouds, sources, sites, time.
- **Zapmeta** gives users basic options to narrow searches

5.5.6 Blended results:

There are some search engines that tries and blend a variety of results onto one page for user - websites, news, video, images and so on. Good for an overall view of a subject area. Unfortunately there are not very many of them!

- **Allplus** for clusters, web results, news, images, video
- **SearchLion** covers Web, images, news, video,

5.6 SEARCHING EFFECTIVELY AND EFFICIENTLY ON THE WEB:

There are many type of search tools that can be used to locate information on the World Wide Web like search engines web subject directories, meta search engines, specialized subject search engines and deep web (Invisible web). Various search tools are developed by different companies and have different search features and techniques. They search differently and overlapping the WWW. However not a single search tool searches all of the web sites in one step (there are millions of web sites and more are added each and every day). Generally databases contains millions of pages and automated software's ("robots" or "spiders") scan the internet and collect information together, whereas the search engine interface permits to search for certain words or phrases found on Web pages.

Generally URL address is a composition of protocol, address or domain name of computer and location of the resources etc e.g. URL http://www.lib.csus.edu/databases/ . The part before the colon mark sign is the access method or protocol, hypertext transfer protocol (http), the part after the double slashes is the net address or domain name of the computer where the resource is located and the directory path and filename come after the next slash. Common Codes used in Domain Names are :

- **edu** - higher education
- **com** - commercial firms (+22 million)
- **gov** - government agencies
- **mil** - military (US)
- **org** - general noncommercial organizations
- **net** - computer networks
- **int** - international organizations
- **State or Country of origin**:
  - **uk** (United Kingdom)
  - **ca** (Canada)
  - **ca.us** (California. United States)
  - **in** (India)

New codes used now are :

- **.info** (anyone)
- **.biz** (business)
- **.name** (individuals)
- **.pro** (professionals)
- **.museum** (accredited)
- **.aero** (Airtransport industry)
- **.coop** (business cooperatives)
- **Kids.us** (Content and technology restrictions)

In a search engine, user are searching for information within selected search engine only and not the entire WWW. The benefits of searching using the search engine which contain millions of web pages. The search hits retrieved are based on the match of the key word(s) or phrases that are looking for by the users. The search engines are very useful in searching for unique or specific topics of interest. The search using search engines has also some drawbacks and the main is gets thousands or millions of results for a single term applied. Google, Altavista, Lycos are the examples of search engines. Out of the total results many of the results may not be exactly what users are looking for, especially when using broad or common terms as key term. To get proper results the users are evaluating web sites gathered in searches and are placed in the directory for use.

In web subject directories a collection of web sites gathered by the creators of the directory or submitted by publishers of web sites are grouped together and users evaluate and classify the web sites that are placed in the directory. A higher degree of accuracy obtained using web directories for researching broad subjects or topics.

Meta search engines are similar to search engines but are used to search more than one search engine at a time. Some Meta search engines also shows a small number of the "best" web sites from each search engine based on criteria established by the meta search engine. The benefit of searching meta search engines while searching on the web is that users search several search engines at a time e.g. Dogpile. Invisible web covers Web sites that are hidden from use by the general public and it is also known

as the Deep Web which includes specialized databases and directories. Invisible web can be useful for searching specific topics or unique terms. Invisible web contains commercial databases that charge a fee, e.g., library research databases of periodical articles. Sites that require membership or a login, Searchable pages such as catalogs, phone books or directories etc. However Invisible Web is not used for conventional search engines and directories. User must know the URL or search using a search tool specifically created for searching parts of the Invisible Web. e..g Complete Planet (**http://www.completeplanet.com**)

5.7 SEARCH ENGINES FOR LIBRARIES:

5.7.1 Academic Directories and Search Engines:

If someone need to find scholarly material on the web, try using search engines or web directories that specialize in academic or educational websites listed below.

Ask.com **http://www.ask.com**	Ask.com incorporates a variety of search tools including image searching, maps and directions, and news search. The advanced search page (make "advanced search page" link to http://www.ask.com/webadvanced) allows you to limit your search by the date a web page was last updated, geographical region, domain name, and more.
Infomine **http://infomine.ucr.edu**	Built by librarians, Infomine is "a virtual library of Internet resources relevant to faculty, students, and research staff at the university level." You can search Infomine for scholarly web resources in **Biological, Agricultural & Medical Sciences, Social Sciences & Humanities, Business and Economics**, **Visual & Performing Arts,** and more.

Internet Public Library **http://www.ipl.org**	The Internet Public Library has an online **reference centre** with links to dictionaries, encyclopaedias, and other reference materials. The **subject collections** cover topics such as **Arts & Humanities**, **Law, Government, and Political Science**, **Science & Technology**, and more.
Scout Report Archives **http://scout.wisc.edu/archives** **Search Tips**	The Internet Scout selects and annotates websites of interest to the higher education community. The scout archives are searchable by keyword, and can also be browsed by Library of Congress subject headings. From the University of Wisconsin-Madison.
Voice of the Shuttle **http://vos.ucsb.edu** **Search Tips**	From the University of California, Santa Barbara, Voice of the Shuttle is a directory that provides access to scholarly websites for research in the humanities. You can browse through links by subject area (**Art & Art History**, **Gender Studies**, **Literature**, **Media Studies**, etc.) or you can search Voice of the Shuttle for a topic such as **Zora Neale Hurston**.

Scirus **www.scirus.com**	If you need to find websites for a research topic in the sciences, use Scirus.com. Scirus searches the web for scientific information, and searches some science journals in addition to science oriented websites.
Search Tips	The advanced search in Scirus.com allows you to limit your search to specific types of science information (conference proceedings, patents, scientists' homepages, etc.) or by subject area (life sciences, social and behavioral sciences, etc.) Scirus will rewrite your search, if using different syntax will likely provide you with better results. Most searches in Scirus will also display related keywords that you could use to refine your search. Example: A search in Scirus for string theory will give you a list of results from the web and science journals (many of which require the subscription access that Tisch Library provides for selected journals), along with other keywords like "black holes", "cosmology", and "superstring theory."

5.7.2 General Search Engines:

Google www.google.com	Google has many advanced search options that will help you find useful information. Advanced searching in Google - The advanced search in Google allows you to limit your search by domain name, for example specifying that you only want .edu pages. Google U.S. Government - A Google search of U.S. government websites only. This search engine is useful if you are researching current issues or controversial topics. Many government agencies maintain informative webpages with detailed documents and reports freely available online.
Google Scholar	Google Scholar is a new beta search engine from Google that is designed to help people find scholarly material on the web. Although it is too early to tell for sure what portion of scholarly material may be included in Google Scholar, it may be useful for locating material such as research studies funded by the government, scholarly prepublication article archives, and "grey literature," -- material that may be scholarly but not published through traditional publishing channels. Some of the material you find on Google Scholar may not be available for free via Google Scholar, but may be available to you as a member of the Tufts University community. In order to take advantage of being a "Tufts person," search

	Google Scholar using the link on the Databases and Articles list, or just use this link: http://www.library.tufts.edu/ezproxy/ezproxy.asp?LOCATION=GoogleScholar. If when you are using Google Scholar you find a citation for an article and an option to buy it, double check the **Tufts Catalog** and the **Electronic Journals List** to see if we subscribe. If not, use our **ILLiad document delivery service** to request copies of articles from journals that we don't own.
Yahoo **search.yahoo.com**	Yahoo allows you to search for webpage's, images, news, and local information. The advanced search page allows you to limit by language, domain name, file format, and country of origin.

5.7.3 Comparison of Search Terms using different Search Engines:

For Librarians or library use few terms researcher has selected and searched using popular search engine to identify the most useful search engines in the area. The following table indicates the comparison between the different search engines using library science terms.

Table 5.7.3 : Comparison of search Terms

Terms Searched	**Search Engines**						
	Google	**Bing**	**GoogleScholar**	**Yahoo**	**IPL2**	**MyWebSerach**	**Lycos**
Thesaurus and Library Science	7,84,000	36,90,000	1,27,000	3,690,000	500	8,12,000	3,690,000
"Thesaurus" and "Library Science"	59,800	39,000	7,460	39,000	130	7.09	39,000
AACR 2	3,68,000	4,00,000	1,88,000	400,000	125	2,66,000	3,81,000
"AACR2" and Library Science	78300	18,800	10,300	18,800	96	10,300	36,300
Colon Classification	14,600,000	50,60,000	9,27,00	5,060,000	131	15,50,000	5,040,000
"Colon Classification"	43,000	34,200	3,140	34,200	0	2,930	34,200
Uniterm indexing	5,550	52,400	267	52,500	22	701	52,500
"Uniterm indexing"	1,420	7,760	155	7,760	0	181	7,760
web 2.0 and Library Applications	17,600,000	15,40,000	6,28,000	47,600,000	500	11,200,000	47,600,000
"web 2.0" and "Library Applications"	5770	18	481	4,150	27	700	4,180
Melvil Dewey and Library Science	2,18,000	11,60,000	12,200	3,260,000	500	12,400	3,260,000
"Melvil Dewey" and "Librray Science"	13,300	10,600	2,130	10,600	2	1,770	10,600
Ranganathan S R and Library Science	2,20,000	4,95,000	10,700	52,200,000	500	11,600	52,200,000
"Ranganathan S R" and "Library Science"	12,300	1,070	1,660	6,900	1	869	6,920
OPAC and Library Science	6,22,000	3,78,000	23,200	16,400,000	500	7,58,000	16,500,000
"OPAC" and "Library Science"	1,79,000	22,400	5,220	64,400	99	6,320	64,400

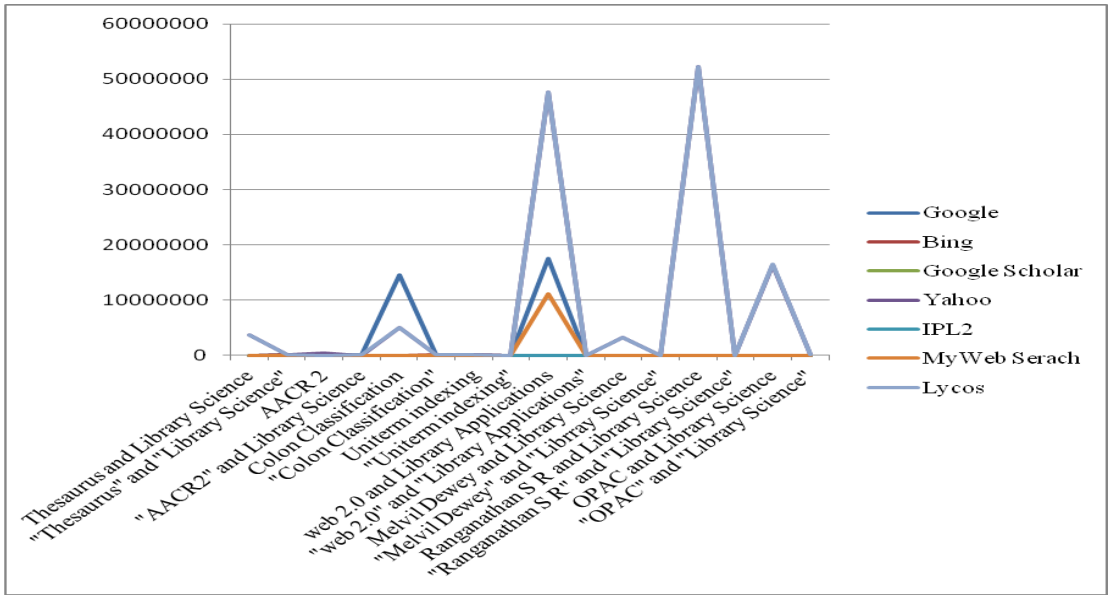

Fig: Comparison of terms

Observation:

While searching the library search terms by using different search engines, it is observed that Bing (http://www.bing.com/)_is a different search engine than others as there is a possibility for compacting or narrow down the search using language and geographical area. Yahoo and Lycos are showing almost the similar results (www.yahoo.com and www.lycos.in). IPL2 is a specialized search engine for the library science and hence minimum search hits are traced. It is concluded that on the basis of search hits Google scholar, Bing and IPL2 are the best search engines. Further it is noticed that there is a need to use Boolean operations and quotes to minimize the search results instead using plain terms. Thus selecting a search engine for the subject specific search and use of different tools for the reducing search hit is a skill of searcher. It is also necessary to use metasearch engines to get the detailed search.

5.8 SEARCHING ON THE WEB USING DIFFERENT TOOLS:

The following four types of search tools are selected to analyse the search results obtained using them and such studies helps in evaluating the performance of different tools and making effective searches using the web.

- **Google** (as a Search Engine)

- **Yahoo!** (as a Web Directory)
- **Dogpile** (as a Metasearch Engine)
- **Complete Planet** (as an Invisible Web)

The result indicates the following:

The specialized search engines or expert pages are also available on the net viz.

- Infomine - Scholarly Internet Resource Collection available at http://infomine.ucr.edu/
- Librarians Index to the Internet Information available as http://lii.org/
- The WWW Virtual Library available at http://www.vlib.org
- CSUS Librarian Guides available as http://library.csus.edu/guides/

The Web search tools are characterized by:
Search multiple search engines simultaneously.
Find sites that answer natural language questions.
Ranks sites by how many links have been made to them.
Sorts matches into folders by categories.
Have advanced searching features Or - combination of the above.

5.9 WEB SEARCHING TIPS:

- Use unique words or phrases.
- Check spelling !
- Use synonyms or multiple spellings
- Try more than one search engine.
- Use words like “research” or “policy” to find more scholarly sites.
- Use domain limit feature e.g., Domain:edu or domain:gov
- Use Bookmarks or Favorites
- Use pull-down menus instead of the back button or use the history or right mouse button.
- Use stop and reload buttons if loading a document takes too long time.

- CTRL ALT DEL will bring up Windows 2000 Task Manager and close the browser if it is not responding.
- use specialized search engines available for all the topics user search engine guide to know different search engines available at http://www.searchengineguide.com and try Search Engine Watch at http://www.searchenginewatch.com
- Use popular search engines like All the Web, AltaVista, Gigablast, Ask Jeeves, Dogpile, Google, HotBot, Metacrawler, LookSmart, Lycos, MSN Search, Netscape Search, Teoma, WiseNut and Yahoo!
- use Google scholar and Cirrus for scientific and academic searching as well as academic search engines available

5.10 BEST SEARCH ENGINES FOR LIBRARIES:

To understand the scope of research topic:	**Intute**	Investigate annotated academic sites (**advanced search**)
	INFOMINE	Search annotated academic sites and subject databases (**advanced search**)
	Academic Info Subject Guides	Browse subject guides with descriptions of relevant sites
To see **related** topics	**Google**	Uncover buried sites using "related searches"
	Bing	Search for your topic, then drill down "related searches"
To **refine and narrow** research topic	SurfWax	Search for your topic, then click "Focus" (top) to show similar, broader, and narrower topics
	iSeek Education	Ask a question or search a topic in this database of "trusted resources" - use "targets" to refine search

	Wikipedia	Drill down “Contents” to explore subtopics
To choose a **controversial issue**	**Hot Topics (Google Custom Search)**	Begin your search on selective hot topic sites
	IDEA Portal	Browse or search a debate topic database with pro/con arguments
	Glean Comparison Search	Build your pro/con search using comparative terms (K-12)
To assess **background** on possible topics	Sweet Search	A selective search of Web information for students
	Wikipedia	Search this wiki (quality content is starred), then follow article links to more information
	Columbia Encyclopedia	Search basic factual information in this encyclopedia (c 2000)
To find authoritative sites chosen by an expert researcher	INFOMINE	Librarian-selected scholarly sites
	LibGuides	Librarian-created topic pathfinders
	Infotopia	Customized safe-search of educator-selected sites
To get **personal help** from experts	Ask an ipl2 Librarian	Get answers from volunteers and grad students in a week (K-12)
	AllExperts	Ask your question of a self-identified volunteer subject-expert
	Ask a Librarian	Library research questions answered in five days (no homework questions)
To get **ranked or tagged** sites as valuable or relevant	Google	High PageRank means popular, relevant sites link to the page
	Technorati	Browse or search user-identified subjects ("tags") for blog advice or opinions

	Ask.com	High Expert Rank indicates subject-specific popularity
To get **primary** sources	American Memory	Locate documents, sound recordings, images, maps, and other American primary sources
	Ready, 'Net, Go!	Browse worldwide archival index
	Library and Archival	Search for online exhibitions selected by Smithsonian
	Exhibitions on the Web	Librarians
To get **peer-reviewed journal** articles	Open J-Gate	Search narrow term in open-access global journal literature (advanced search)
	Directory of Open Access Journals	Search by narrow term to find open access journal articles or browse a subject directory
To get official government information	**USA.gov**	Search official U.S. government information and services
	Foreign Governments (Intl. Documents Coll., Northwestern U)	Alphabetical links to the official websites of national governments
	Directgov	Search or browse official UK information and services
To get in-depth information **about a country** or unrepresented territory	CIA World Factbook	Search on keyword or select country or location name
	Unrepresented Nations and Peoples Organization (UNPO)	Browse Web sites from indigenous peoples, occupied nations, minorities and independent states or territories
For **science, technology engineering and**	Scirus	Science-specific Web portals, reports, peer-reviewed articles,

mathematics (STEM) research or sources		patents, preprints and journals
	National Science Digital Library (NSDL)	Search by grade level, subject (STEM) and resource format
	Intute	Use advanced search to limit search by science, technology, or mathematics subject areas
For reputable **health** information	Medline Plus	Search diseases, conditions and health topics
	Mayo Clinic	Browse by disease or search conditions, symptoms, tests and health topics
	KidsHealth	Health information directed to kids, teens or parents
For **legal** documents, agencies or news	Find Law	Search cases and codes (U.S. federal and state), news and commentary
	Legal Information Institute (Cornell U Law)	Search or browse wiki of worldwide legal information
	State Legislative Websites Directory	Search database of U.S. state legislatures, DC and territories for home page, bills, press rooms, statutes, etc.
For **creative and performing arts** sources	Intute	Use advanced search to limit search to arts and humanities subject areas
	Art History Resources on the Web	Global art history resources chosen by a scholar
	JURN	Google custom search of 3,500+ e-journals in the arts and humanities

Current information within the last hour	Google Real-Time	Choose "past hour" from the left column for the most recent news
	10x10	Explore 100 words and pictures that "matter most" globally in the last hour
Today	**Google News**	View top news stories and refine by category or topic
	NewsNow	Search breaking global news headlines or newsfeeds (UK service)
	Newseum	Browse today's front page treatment of news from nearly 100 countries
Recent	**Google**	Search and limit by time period, or choose "timeline" (from "more search tools" on left) to see a topic's evolution
	Yahoo News	Search recent news and filter by time period ("past week")
Recent (with analysis)	BBC Special Reports	In-depth topic coverage including news features, analysis, photos, audio and video
	Times Topics	Collected news, reference and archival information, photos, graphics, audio and video files about topics
	PolitiFact	Search news keyword or browse fact checking of statements made by members of Congress, the White House, lobbyists and interest groups
long-term investigative reports	ProPublica	News investigations of significant government,

		business, and institutional wrongdoing
	Center for Public Integrity	Original reporting of public issues designed to make "institutional power more transparent and accountable"
	Center for Investigative Reporting	Critical investigations of injustice or abuse of power with actionable information to assist citizens
A particular time period (decade, century, era)	HistoryWorld	Enter year event to retrieve timeline, then click on icons for information or images
	INFOMINE	Search by a term like "Golden Age" or "18th century"
	Wikipedia: List of Timelines	Browse Wikipedia's list of timelines (civilizations, people, events, etc.)
Historical	**American Memory**	Search America's primary source documents and images, browse by topic, time period, medium or place
	ipl2	Drill down into the **history** section or search fewer, broader terms (e.g., "terrorists" not "Righteous Path")
	Digital History	High-quality historical resources, primary sources, multimedia, subject guides
Ancient	Ancient History Sourcebook	Search online ancient-history texts, images, audio, or browse by region, period (e.g., Persia, Late Antiquity)

	ipl2	Drill down into **ancient history** section or search fewer, broader terms (e.g., "Greece" not "Spartan women")
A person	Biography.com	Search 25,000+ biographies by name, keyword and profession
	Who2	Search for famous people with "four good links" to more information
	Dictionary of Canadian Biography Online	Search biographies from Canada's history (16th-20th century)
A place	CIA World Factbook	Select country for basic profile and transnational issues
	Country Studies	**Cross-search** or view a country (last update 1998) - historical, social, economic, political and national security data
	Stately Knowledge	Basic U.S. state facts, links to state government site and encyclopedia (IPL Kid Space)
A company	NYPL: Searching for Company Information	Find company information based on your need
General reference answers	Ask.com	Find a fact, biography, statistic or conversion, or reference answer
	Columbia Encyclopedia	Find basic information
	Yahoo	Learn shortcut words to get quick answers
Opinions on current issues	Headline Spot Opinion/Editorials	Browse opinion/editorial in U.S. and some international

		newspapers
	Polling Report	Browse results of U.S. public opinion surveys
	Issues & Press (U.S. Dept. of State)	Investigate U.S. position on international issues
News from other countries' perspectives	World Press Review	Get nonpartisan summaries of views outside U.S.
	Newspaperindex	Browse selected world newspapers
	ABYZ News Links	Browse international broadcast and Internet news, newspapers, magazines, and press agencies
Multiple perspectives on hot social and political topics	Social Issues	Links to pro/con on current social issues
	Public Agenda	Analysis of public attitudes on social issues with overview, pro/con, organization links
	UN News Centre: News Focus	Browse for UN-related issues by region, country or topic
Compare news treatment	**Newseum**	Compare news reporting on U.S. front pages
	PressDisplay	Compare news reporting from 55 countries
Maps	**Google Maps**	Search and view satellite and street-level maps
	MapMachine	Search, browse and print country, physical and political maps
	American FactFinder Maps	See trends/patterns when you superimpose chosen geographical features and census data on U.S. maps
photographs and visual	Google Image	Use advanced search to limit by

images	Search	size, coloration, file type
	Yahoo Image Search	Use advanced search to limit by size and coloration
	Flickr	Search users' photos by their subjects ("tags"), then choose a subtopic ("tag cluster)
Fine art	Artcyclopedia	Search (e.g., artist, medium, movement, subject) or browse for digitized art and online exhibits, see **actual size**
	Intute: Arts and Humanities	Search or browse selected, evaluated resources
Videos	**Yahoo Video Search**	Search by keyword or phrase, use **advanced search** to limit by file format, size, duration and domain
	YouTube	Search for, watch or buy an ever-growing collection of TV shows, movies, music videos, documentaries, and personal productions
	Internet Archive: Moving Image Archive	Search public domain films, newsreels, ads, documentaries, television series and other "cultural artifacts"
radio	**PublicRadioFan**	Find public radio programs and podcasts worldwide
music	Google	To find song lyrics, search (in quotes) title or performer (plus) "song lyrics," to find information about the song's history search title (in quotes) and "origin"
sounds	FindSounds	Get sound effects and music

		samples: select a keyword or search a term limited by file format, quality and size
speeches	American Rhetoric	Search site or browse categories of full-text, audio and video of American public speeches, lectures, debates, interviews, events
	History and Politics Out Loud	Search or browse full-text public-domain audio with transcripts of 20th century political and historical events, personalities, and protest songs
	American Memory	Find **sound recordings** of American primary source speeches
Quotations	Bartleby.com Quotations	Search classic passages, phrases and proverbs (1901 edn.)
	Quotations Page	Search word, phrase, author within or across quotation collections
	Quoteland	Search by keyword or browse topics, authors
statistical data	Statistical Information (NoodleTools)	Links to statistical databases and advice on locating and understanding data
Dictionary or thesaurus (for definitions, etymology, pronunciation, synonyms)	Yahoo Reference	Definitions, etymology, synonyms (English and Spanish) and audio-pronunciation
	Merriam-Webster Dictionary and Thesaurus	Definitions, etymology, synonyms and audio-pronunciation
	Word Central	Definitions with pictures

		(student dictionary)
Encyclopedia	**Columbia Encyclopaedia**	Factual information (updated 6/05)
	Wikipedia	Volunteer-created and collaboratively edited: valuable for current topics (e.g., people in the news), technology (e.g., podcasting) -- information quality uneven
Almanac data	Country at a Glance (U.N.)	Basic country profile, use Info Nation to compare data from 6 countries
	Information Please Almanac	Statistical and factual data -- beware popup minefield
Books and other printed works	WorldCat	Search for books and reviews, options to refine results, check your local library's holdings
	Google Scholar	Search (free and fee) scholarly works, locate related information using "cited by" links, use **advanced search** to limit (author, date, phrase, in title, subject area)
	A9 Open Search	Search for books by keyword, then "Search Inside!" to see keyword-in-context
Run search query **periodically** and notified of new results	Giga Alert	Run Google search of 3 interests and get e-mail or RSS notification of new results
	Google Alerts	Run periodic Google searches and get e-mail (no RSS) notification of new results
specify a **country** where search results are	Google	Limit by domain (**advanced search**) or by country

located		(**Language Tools**)
find sites organized by the **Dewey Decimal System** or **Library of Congress Classification**	Virtual LRC	Select Dewey Decimal number before searching
	INFOMINE	Drill down into **Library of Congress Classification directory**
Locate resources by **file type**	Google	**Limit search** by file type (.pdf, .ps, .doc, .xls, .ppt, .rtf)
	Yahoo	**Limit search** by file type (.html, .pdf, .doc, .xls, .ppt, .xml, .txt)
For a kid	KidsClick!	Find kid-friendly sites with educational content (grades K-7) selected by librarians
	Ask Kids	Search by keyword, then select the best-match question for answers and links
	Yahoo Kids	Select from kid-safe sites (grades 2- 7) organized by topic
Pretty new to the Internet	Google	Largest general purpose search engine
	Yahoo	Large, general purpose search engine
	ipl2	Easy-to-navigate, well-annotated directory of librarian-selected Web sites
An Internet wizard	Exalead	Configure highly-specific searches including proximity ("folk tales NEAR sun"), but smaller index than Google or Yahoo
	INFOMINE	Configure a narrow search of a large, comprehensive academic virtual library (Web sites, databases, electronic journals,

		electronic books, bulletin boards, directories of researchers)

(**Source:**
http://www.noodletools.com/debbie/literacies/information/5locate/adviceengine.html)

5.11 USEFUL SEARCH ENGINES FOR LIBRARIANS:

Search engines are useful for finding information on organizations, groups, and personal web pages related to a topic. They can also be used for finding articles, but it can be difficult to narrow down results, find relevant material, and assess the legitimacy of information found on the Internet. It is especially important to be wary when using Internet sources, as there is are no quality control mechanisms that verify the validity of information on individual web pages.

Students, teachers and the public turn to their librarians for help researching everything from technology to genealogy to homework help and lesson plans. Even if library is equipped with subscriptions and memberships to top of the line databases and online journals, probably had to get creative during a patron's requested search for something unfamiliar. For providing help to users librarians can turn to 50 search engines, designed to pull information from the Web.

1) **Ms. Freckles**: Adorable Ms. Freckles can search online for different file types, definitions, translations, film, finance sites, and a lot more all at once.
2) **Fazzle**: Search the web's best, the entire web, downloads, images, videos, audio or headline news. Select an advanced search to find incredibly specific results.
3) **Mamma**: "The mother of all search engines," librarians search the web or video. Next to your results is an option to refine search by choosing a suggested category.
4) **1-Page Multi Search**: Type your search into one or several of the following search engines at once: Alta Vista, AOL, EntireWeb, Gigablast, Hot Bot, Lycos, Scrub, Yahoo!, Google, YouTube, Dogpile, Ask Jeeves, and a lot more.

5) **iZito**: Busy librarians who are constantly finding new reference sites and search engines will like iZito because of its ability to save history in an easy drop down tab.
6) **Metacafe**: Find videos on this site if wants a change from YouTube.
7) **Picsearch**: This is a large photo search engine have more than 2 billion images in directory.
8) **Get a Podcast**: Search for podcasts all around the web in this directory.
9) **Shareware**: For installing new software programs on computers, turn to Shareware first, which pulls up tons of free programs and downloads.

5.11.1 Google Search Engines:

A Google search doesn't just mean typing in a keyword on the homepage and seeing what pops up. Try out these niche search engines sponsored by Google to find books, images and more information that librarians find useful.

1) **Google Image Search**: Ask Google to bring up the most popular images on the web with this engine.
2) **Google Scholar**: Get connected to scholarly journals and publications here.
3) **Google Books**: Search online copies of books on this search engine, which features categories like literature and science fiction to biology and linguistics to highly cited to categories organized by subject and keyword.
4) **Alerts**: Set up Google Alerts for any subject so that you'll get results sent to your inbox every time there's a new site, blog or keyword mention on the web.

5.11.2 Sites for Librarians:

From family friendly and kid-safe searches to science and medical search engines, these niche sites can help you with very specific research projects.

1) **Scirus**: Pull up science-related results on this research-oriented search engine. One can find "not only journal content but also scientists' homepages, courseware, pre-print server material, patents and institutional repository and website information."

2) **Librarians' Internet Index**: Connected to quality, authoritative sites. Search by keyword or narrow down your search by browsing categories like business, government, media, health, computers, or the arts and humanities.
3) **Family Friendly Search**: Librarians at elementary and middle schools, as well as public librarians, may be interested in directing patrons to this site, which is safe for kids.
4) **Intute**: This British search engine lets helps in picking search options in the following categories for a specialized search: science and technology, arts and humanities, social sciences, and the health and life sciences.
5) **PubMed**: PubMed is one of the premier search engines for medical students and researchers. One can find journal articles, citations, clinical information and more.
6) **Meta-Index for U.S. Legal Research**: On the GSU College of Law site, librarians and patrons can take advantage of this meta-index which brings up judicial opinions, legislation and more.
7) **Internship Programs**: College librarians may want to direct students to this search engine, which connects searchers to internship opportunities.
8) **Congoo**: For current events and news searches, use Congoo to connect to the latest in technology, industry, business, world news, finance, politics, Internet trends and more.
9) **CataLaw**: CataLaw is another law search engine that organizes "all indexes of law and government into a uniform, universal and unique metaindex."
10) **USGenWeb Archives**: Helps patrons with genealogy searches with this engine.

5.11.3 Custom Searches:

Tailor search to your daily needs with these search engines, which can be modified by remembering search history, customizing templates and more.

1) **mozbot**: Pick a language and customize your search with this engine. Mozbot can also add results to your favorites, send results by e-mail, display thumbnails of different sites, and provide suggestions for similar sites.
2) **Curriculum Search**: Help teachers find reference materials, lesson plans and tools by searching this Google custom search engine.

3) **Computer Science Research**: Use this search engine or adapt it to make your own to find computer science materials and references.
4) **Rollyo**: Choose to search categories like health, travel, tech, reference and others using Rollyo, a system that "create[s] search engines using the sources you trust."
5) **Ujiko**: This sleekly designed search engine.

5.11.4 Reference Searches:

The following list of search engines prove useful to all kinds of librarians in search of dictionaries and other reference materials.

1) **JustCite**: JustCite is a legal search engine and can help to find citations.
2) **Online Journals Search Engine**: Search scientific databases and journals.
3) **Powerset**: For a basic Q&A session, use Powerset to quickly search Wikipedia entries.
4) **Infoplease**: Get information on any subject, from history and government to arts and entertainment to world news to biographical information to homework help.
5) **Guide Star**: This search tool is great for public librarians or librarians who work with teachers wanting information on grants and nonprofits. Type in the name of an organization or keyword to find nonprofit group information.
6) **JoeAnt**: You can get answers to research queries on any subject at JoeAnt, from computers to science to politics to the humanities to business law.
7) **Find Tutorials**: Find tutorials for practically everything on this search site, from education to culture to spirituality, to finance to the Internet.
8) **RefDesk**: RefDesk is known as the "fact checker for the Internet." You can search MSN, Google, Yahoo! or Wikipedia, as well as various dictionaries and periodicals.
9) **OneLook Dictionary Search**: Get detailed definitions, translations and more on this search engine, which pulls from over 1,000 different dictionaries.
10) **The Dictionary of Free Online Books and Shopping**: Look up and access books online for free using this search engine, which includes educational books, history books, children's books, biographies, political books and a lot more.

11) **Thinkers: Wisdom**: This site features a literary search engine called Wisdom that can search the web, images, audio, video, a dictionary and more.
12) **Information.com**: Use the web search or search encyclopedias, blogs, articles and online groups to get creative with your reference search.

5.11.5 Library Search Engines:

Check out search engines that are designed to emulate or are sponsored by libraries and librarians.

1) **Internet Public Library**: Find references, search the collections by subject, check out the reading room or KidSpace when you visit this online public library.
2) **The Open Library**: Here, librarians discover "one web page for every book." This open source project also features an advanced search, connecting you to the exact book and full-text publication you're looking for.
3) **Awesome Library**: Find full-text books, journals, kid-safe sites, business information and more on this online library search engine.
4) **LibDex**: Search the indexes and other information for 18,000 different libraries here.
5) **WorldCat**: WorldCat helps patrons and librarians "find items in libraries near you." Search for books, DVDs, CDs and articles.

No doubt searching of information on net using web search engines gets more information to librarians and users but some drawbacks are also to be considered by all users.

- Free to anyone with computer access and also needs speed of internet.
- No review standards with regard to contents of the sites. Users have to find out the utility.
- Information is not organized like standard information sources.

- Information is not stable; locations and content continually change and hence stability and citing is an issue.
- Evaluative concept is to be followed.
- Skill of information searching and multiple search engine search concept is to be acquired by users for efficient and prompt searching.

Conclusion:

In conclusion it is revealed that LIS Professionals are satisfied with the retrieved information using search engines. In brief search engines more effective are:

• A9.com • KellySearch.com • AOL.com * • LookSmart.com • AllTheWeb.com • Lookup.com • AltaVista.com * (popular language translator) • Lycos.com * • **Alexa.com** - Important search engine • Mamma.com • Answers.com • MaviCaNet.com • Ask.com * • MetaCrawler • BBC - Search the web • MonsterCrawler.com • Buzzle.com • **MSN.com** (Bing) - 1st search engine introduce by Microsoft • Comcast.net • MyWebSearch.com • DMOZ.org • MyWaySearch.com • Dogpile.com • NBCi and BingBC.com • EuroSeek.com • Netscape Search * • Excite.com • TheNet1.com • Findit2000.net • PlanetSearch.com • FindWhat.com • Pathfinder / Time-Warner • GenieKnows.com • **Rediff.com** - India's good search engine • Gigablast.com • Scour.com • **Google.com** - No.1 search engine • Search.com • Go.com * • Searchit.com • Go2Net.com • SearchKing.com • HogSearch.com • Smarter.com • HotBot.com • Snap.com • Info.com • SplatSearch.com • InfoSpace.com • WebCrawler.com * • IXQuick.com • Where2Go.com • JumpCity.com • WiseNut.com • Kanoodle • **Yahoo.com** - Worldwide 2nd rank search engine

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CHAPTER-VI

LIBRARY PORTAL:
IMPORTANCE FOR SEARCHING INFORMATION

CHAPTER-VI

LIBRARY PORTAL:
IMPORTANCE FOR SEARCHING INFORMATION

6.1 INTRODUCTION:

A library portal is defined as "a combination of software components that unify the user experience of discovering and accessing information" in contrast to a "single technology" to provide "services that support discovery, access and effective use of information". The joint Information System Committee (Konnur and Kachrerki ( ) defines portal as " A network service that brings together content from diverse distributed resources using technologies such as cross searching, harvesting, and alerting and collates this in to an amalgamated form for presentation via A WEB browser to the user".

What is a Portal?

Initially, the term portal was used to refer to well-known Internet search and navigation sites that provided a starting point for web users to explore and access information on the World Wide Web. The original portals were search engines. The initial value proposition was to offer a full text index of document content and a chance to take advantage of the hyper linking capabilities built into the web protocols. Internet navigation sites, such as Yahoo!, Excite, Infoseek, AOL, MSN, Netscape Netcenter and Lycos, represented the next phase of portal development. The term "Internet portal" (or "web portal") began to be used to describe these mega-sites because many users used them as a "starting point" for their web surfing. The term "search engine" had become inadequate to describe the breadth of the offerings, although search and navigation are still pivotal to most people's online experience. Compared to the original Internet search engines, Internet portals offer a more structured, navigable interface. Browsing is an organized hierarchy of categories developed by people (rather than computers).

While these public Internet portals continue to flourish, the market for portal technology is increasingly focused on the better delivery of corporate information.

Portal technology has significantly matured since the public search sites were first built, and has been used to build a diverse range of portal types, including specialized portals, enterprise portals, workspace portals, market space portals, knowledge portals etc.

6.2.1 Definition of Portals:

Traditionally, a portal denotes a gate, a door, or entrance. The idea of a portal is to collect information from different sources and create a single point of access to information - a library of categorized and personalized content. It is very much the idea of a personalized filter into the web.

A web portal is most often one specially-designed Web page which brings information together from diverse sources in a uniform way. Usually, each information source gets its dedicated area on the page for displaying information.

6.2.2 Need of Portal:

The portals are needed because of:

- Enables universal login
- Handles both structured and unstructured data
- Facilitates multi-channel consistency
- Facilitates messaging and notification
- Automated tuning: pervasive content can be tuned based on personalization, location, browser, etc.
- Integration to other systems

6.2.3 Key features of portals:

The key features summarized as under:

- Security
- Access different data
- Transactions
- Search
- Publish Content
- Personal Content

6.2.4 Elements of Portal:

Following are the major and essential elements need to be considered while developing Library or any portal. (Konnur and Kacherki).

1) Ease of use: Effectively organized homepage. Ease in use causes due to multiple path provision to find information in a limited clicks.
2) Search and Navigation: Effective search functionality and site maps are necessary in home page.
3) Resource Linking: Resource linking joins the resources together. Cross linking and multiple path finding is also desired while linking.
4) Personalization: Each user or community or user group can use portal effectively. A portal provide users to store the setting and tailor the contents.
5) User Authentication and Interactive services are other elements in consideration.

6.3 Functions of Portals:

The ideal portal is based on eight functionality areas:

1. **Search and Navigation** : Although most of the functionality is not new, the new idea is the business value is considerably more than the sum of its parts. Thus, a successful portal does not only consist of either a good collaboration support or a good integration of the information sources. Successful portal has to support its users in an efficient searches for contents and the portals has to support:

- Automatically present its users with the information appropriate to the users role.
- Suggest additional information to the user, and/or allow the user to voluntarily personalize the information presented by the portal.
- Allow the user to search for information that was not previously known to be relevant to the user's role, but which may be available through the portal.

2. **Information integration (content management)** : A portal need to warrant the integration of information from disparate sources. The user also be able to

optimally use information. One such promising technique of innovative interfaces is the Unified Content API (Application Programming Interface) which speeds up the development of portal applications. The Unified Content API supports all current tools for developing web environments, such as JAVA, C++, ActiveX, Visual- and Non-Visual-Java Beans.

3. **Personalization** : Personalization is vital to the delivery of appropriate information to portal users, each user gets only the information which is specifically tailored to his/her needs. Personalization should be based on user roles, as well as user preferences.

   There are several types of personalization:

- **Personalization of navigation**
  e.g. shortcuts to specific information, mostly known as bookmarks or favorites
- **Personalization of data/content**
  e.g. which stocks do I want to see in my stock ticker
- **Personalization of layout**
  e.g. what information appears where on the screen, in which format, color or size

4. **Notification (push technology)** : Notification (push technology) is referred to as a system in which a user receives information automatically from a network server. Push technologies are designed to send information and software directly to a user's desktop without the user actively requesting it. Thus, the user has the opportunity to subscribe to active information sources (such as newsfeeds and periodically updated reports) and ask to be alerted when documents are updated.

5. **Task management and workflow** : Portals providing task management services can help users take part in and/or manage formally defined business processes. The workflow functionality allows the automation of business

processes. Thus, as part of a workflow-automated business process, a portal should be able to prompt its users when they have tasks to perform.

6. **Collaboration and Groupware** : Knowledge management and groupware ensure that the required information is stored in the right place and in the right mode. By this means the right persons are brought together with the right information. Groupware software assists in less formal collaboration than workflow tools. As with workflow automation, groupware increases the value delivered by many types of specialized portals; for example, it:

- increases the attractiveness of business-to-consumer e-commerce portals
- Enables informal communication between suppliers and customers in business-to-business e-commerce portals.
- Supply chain portals are also dependent on collaboration support in order to help suppliers and their customers manage their relationships. Moreover, collaboration support is a key requirement for knowledge portals.

7. **Integration of applications and business intelligence** : In addition to the already mentioned functionalities, a portal can integrate and support a specific application type. E.g. application service provider (ASP) application, business intelligence (BI) functionality and support for e-commerce.

8. **Infrastructure functionality** : The infrastructure functionality constitutes the fundament for the work environment - the other 7 functionalities mentioned above build up on this one. The runtime infrastructure associated with the portal will have a primary effect on manageability, scalability, security and availability.

6.4 Basic Architecture of Portals:

Consider the above eight functionalities of an ideal portal and then the real portals can be visualized. The portal solutions meet the requirements of only single functionalities, thus providing a partial solution for particular problem areas. This is exactly were the distinction between horizontal and vertical portals.

Horizontal Portal:

Horizontal portals target the entire Internet community. These sites, often referred to as "megaportals", usually contain search engines and provide the ability for user to personalize the page by offering various channels (i.e. access to other information such as regional weather, stock quotes or news updates). Yahoo! and Lycos constitute mega portals. These portals are also gateways to contents and services.

Vertical Portal:

According to Gartner Group, vertical portals differ only in their more specific objects and contents from horizontal portals, the technology employed remains the same. Most of the times, vertical portals offer information and services customized to niche audiences about a particular area of interest. Vertical industry portals, known as Vortals, which are sites that provide a gateway to information related to a particular industry, such as, insurance, automobiles, etc. There are innumerable possibilities for establishing special vertical portals. The solutions to develop vertical portals can be divided into 3 major groups.

- **Corporate Portals:**
  provide personalized access to selected information of a specific company
- **Commerce Portals:**
  support business-to-business and business-to-consumer e-commerce information
- **Pervasive Portals:**
  support access via Pervasive Devices such as PDAs. Vertical portals may have a great stake in the future.

6.5 Common Architecture for Horizontal and Vertical Portal:

No matter what type of portal is to be developed but they all conform to a basic architecture and design. The basic architecture of portals is depicted in figure 1. The middle part encompasses all the functionalities and services of an ideal portal. These functionalities should at least in part be fulfilled by any portal, no matter how narrow its focus. The bottom part - connectivity services - able to integrate any data type that

comes into question. Finally, the upper area corresponds to the user interface which enables the presentation of all data and applications.

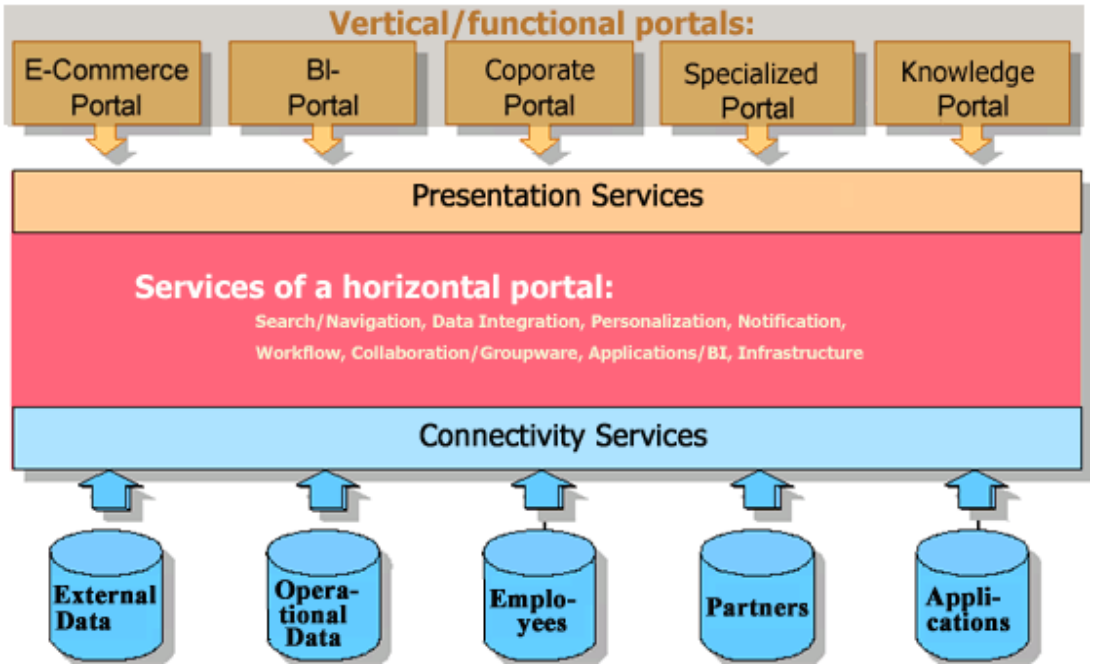
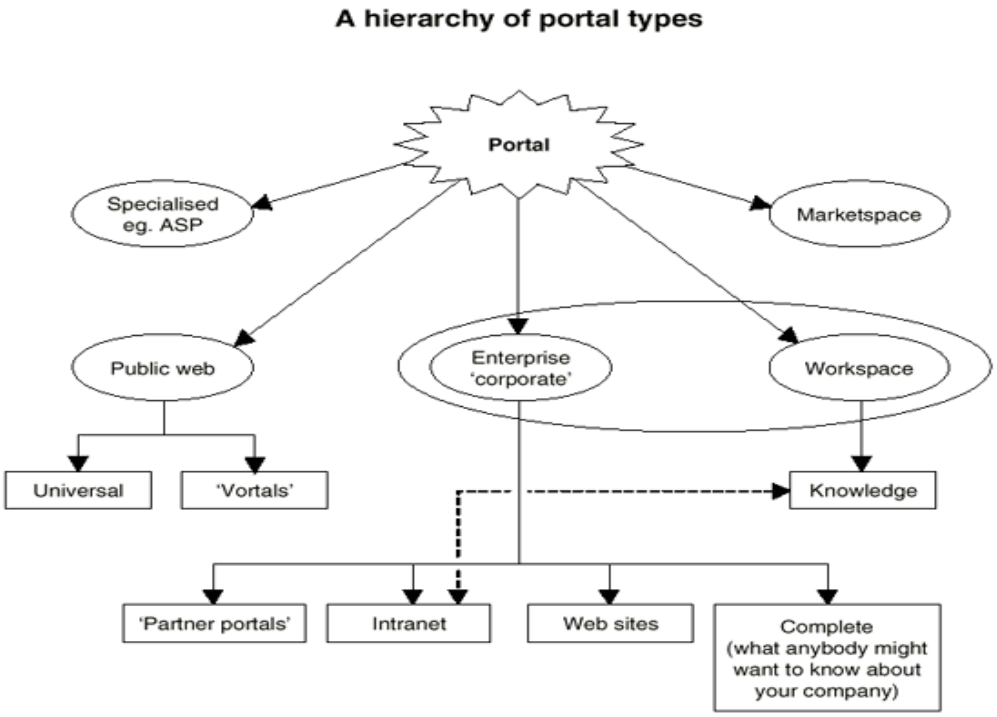


Fig 6.1: Functions of Portal Source:

Portal Types:

The analyst and consulting company Ovum has set up a detailed taxonomy of portal types, their hierarchical affiliations are in Figure 6.2 which depicts Ovum's hierarchy of portal types.



Source: Ovum (Enterprise Portals: New Strategies for Information Delivery/Chapter C)

Figure 6.2: Taxonomy of portals (Source : Ovum's)

Specialized Portals : Specialized portals are designed for a specific purpose which are an ASP (Application Service Provider) portal that provides its customers with access to applications via an extranet or the Internet.

Marketspace Portals : Marketspace portals exist to support business-to-business or business-to-consumer e-commerce. The major functionalities are: software support for e-commerce transactions, ability to find and access rich information about the products on sale and ability to participate in discussion groups with other vendors and/or buyers

Public Web Portals : Public web portals exist to provide easy-to-use and attractive services to the public and the functionalities are: extensive search and/or navigation system, great variety of service offerings, mega-sites used as "starting point" for the web surfing.

Enterprise Portals : An enterprise portal (sometimes called a corporate portal) provides personalized access to an appropriate range of information about a particular company.

Enterprise portals have become one of the new technologies of the Internet. Initially called intranet portals. Enterprise portals exists for the benefit of the company's own employees, this set of technologies has developed to assist and provide access to a company's business partners (suppliers, customers) as well. As opposed to public web portals, enterprise portals aim at providing a virtual workplace for each individual executives, employees, suppliers, customers, third-party service providers, rather than offering access to consumer goods, services, and information. Enterprise portals are designed to give each individual using them access to all of the information, business applications, and services needed to perform their jobs. More advanced enterprise portal solutions provide access via mobile devices, such as cell phones, PDAs, handheld PCs etc. facilitating on the road work, decision making, and business processes.

Workspace Portals : A workspace portal is a single, coherent, integrated portal that presents its users with all the information they need to carry out their jobs.
The workspace portal represents the radical vision of a portal providing the user interface and making available all the information necessary for an employees job role. The current alternatives to a workspace portal are specialized portals and/or the contemporary Windows desktop. Thus, the advantages of workspace portals have to offer over these alternatives ought to be evident and convincing.

Knowledge Portals : Knowledge portals increase the effectiveness of knowledge workers by providing easy access to information that is necessary or helpful to them in one or more specific roles. Knowledge portals are not mere intranet portals since the former are supposed to provide extra functionality such as collaboration services, sophisticated information discovery services and a knowledge map.

6.6 Developing a Library Portal: Points to be considered

Konnur and Kacherki ( ) discussed the role of library portal and librarians task in their communication and expressed the need of library portals, significance, elements, functionality etc. The library portal is needed to help users in searching many information sources at once from different sources. The library portal is related to a variety of web based interfaces to a dynamic one stop home page form where users

can meet their information needs. The term portal relates to variety of web based interfaces to a dynamic one stop home page where users can meet their information needs. The library portal normally covers:

- Access point combining catalogues, subscribed databases, subject gateways, electronic journals etc. Even search engines can be joined to get variety of information.
- "Meta searching tools, browse able interfaces, and online reference help," which aids in the information discovery process
- Links to full-text articles, Open URL,
- Availability of inter library loan (ILL) or document delivery, for material the library does not owned.

Thus portal describes different web based interfaces, and a place to keep information links to information and acts as gateways, communicate to others. A library portal is a single access point. A portal is a powerful Web site that gives users a single point of access to applications and information in a unified interface.

Since the development of World Wide Web users have been accessing one Web page at a time. Later, emerging technologies such as Java, JavaScript, and application servers provided application functionality, usability, stability, and performance improvements that have been the mainstay of Internet computing. Web search engines developed to find the resources in proper order to meet the needs. Later the use of portal initiated to provide the access to the Web search engines form the library home page.
(http://docs.oracle.com/cd/E13218_01/wlp/docs81/overview/overview_wlp.html)

A portal allow users to view each application or Web page in its own window, called a portlet, and a single browser window can contain multiple portlets. For example, a portal page can contain portlets for logging in, searching, displaying news feeds, and managing appointments with a calendar application. The portal contains pages like Home, My Workspace, and HR, whose links appear just above the Login portlet.

6.7 Anatomy of a Portal :

A portal is a collection of resources that can be assembled in different views called "desktops." A desktop is a user's view of a portal, and a single portal can contain multiple desktops. The portal can contain many resources such as portlets that are not included in a desktop. Figure 3 highlight key components of a portal desktop.

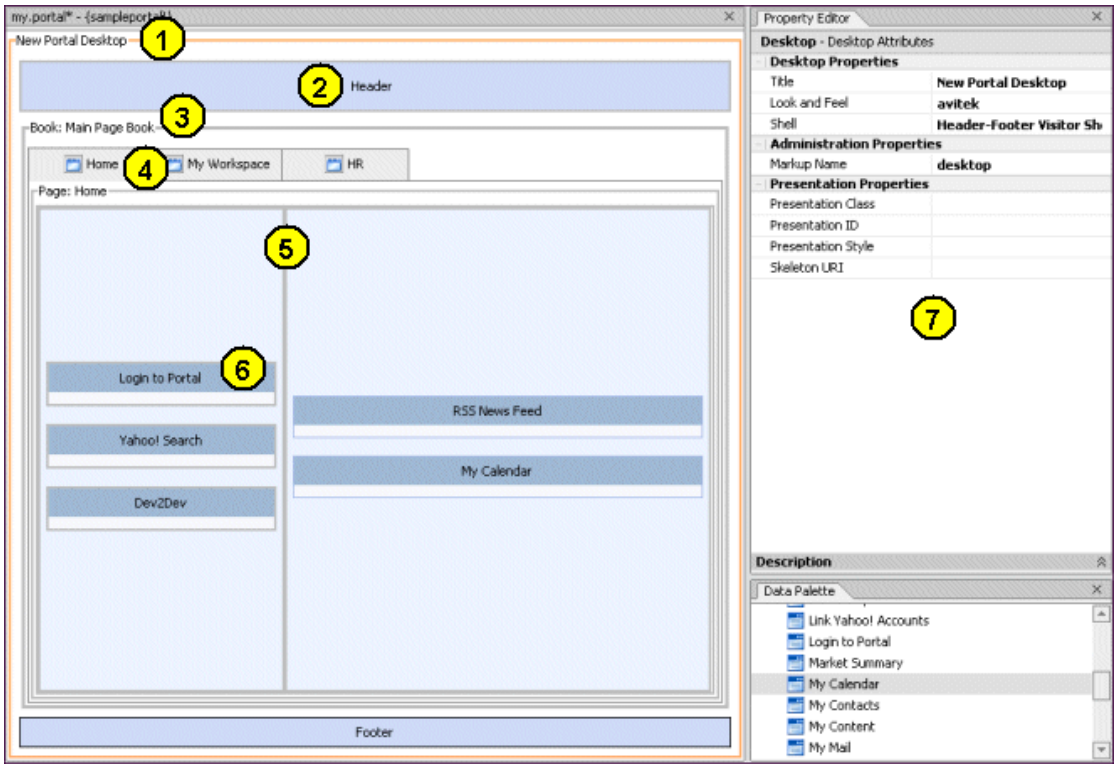


Figure 6.3 Portal Structure

1) Desktop :

The desktop is the top-level container for the portal components included in that specific view of the portal. A Look & Feel on the desktop is made up of two parts referenced by a single XML file: skins and skeletons. Skins contain the graphics, styles, and JavaScript code that determine the look of a desktop. Skeletons control the physical boundary rendering of all portal components. It is possible to select different Look & Feels for a desktop. Portal administrators and end users can also change a desktop's Look & Feel. Portal administrators can create new desktops beyond portal developers create.

2) Head and Footer:

The desktop header and footer display content outside the desktop's books, pages, and portlets (typically above and below). A header/footer combination is defined by a shell, which is an XML file that points to JSP or HTML files containing the content to display (colors, graphics, personalized content, and so on).

3) Top Level Book (Menus and Themes)

The top-level book contains all sub-books, pages, and portlets. The top-level book defines the initial menu navigation style used for the desktop. One can also apply themes to books. Themes are Look & Feel subsets that can make a book look physically different than the rest of the desktop. Portal administrators and end users can also change themes.

4) Pages and Books

Pages and sub-books are the navigable containers used for organizing portlets. One can apply different navigation menu styles to books, and themes to pages and books. Portal administrators and end users can change navigation menus and themes.

5) Layouts

Layouts determine book and portlet positioning on pages. Layouts, defined by an XML file, are divided into cells, or placeholders, in which portlets and books are placed. It is also possible to determine whether portlets are placed horizontally or vertically relative to each other in a placeholder.

6) Portlets

Portlets are the containers of surface Web content and applications in desktops. Each portlet, is a single XML file with a .portlet extension that references the content or application. It is possible to add portlet preferences and configure portlet modes (such as edit and help) add powerful functionality to portlets—all of which is included in the .portlet XML file. The content of each portlet instance is automatically updated if the source .portlet file changes, but each instance of a portlet can be configured in

unique ways (such as changing the titlebar label). Portal developers, administrators, and end users can apply themes to portlets.

7) Property Editor Window:

When developer select a portal component in the Portal Designer, he sets properties for it in the Property Editor window. Most portal configuration in the development environment occurs in the Property Editor window, and changes are automatically written to the portal or portlet XML file.

Fig 6.4 shows the portal components are related hierarchically. and shows the parent/child relationships among portal components as they appear in the underlying .portal XML file, also shown in the figure.

Fig: 6.4 Hirarchical Structure of Desktop Portal

Portal Tools and Services:

In addition to the features already mentioned, Portal also provides the following tools and services to help easily create powerful, dynamic, feature-rich portals:

- Multichannel Support
- Content Management
- Interaction Management
- Search
- Collaboration -
- Edition portlets
- Java Controls

- Portal Visitor Tools
- Commerce
- APIs and Open Standards Support

Thus Weblogic Portals can be developed for searching linking information resources and web search engines links.

Librarian Role

Content development for useful searching to the serving community, addition of data, maintenance of portal and home page, Digital content preservation, linking to the resources, managing copyright issues, providing customer based services to patrons, are the main task to be taken care by the librarian. Librarians can isolate the web search engines as well as web information resources and add them to the portal.

The following recourses and web search engines, archives can be linked through the library portal for the effective use.

Specialty Search Engines for College Students

Ordinary search engines for business or personal use can be used , but they're not very useful to find academic research papers, scholarly articles nor primary sources. The following useful specialty search engines can help to find desired academic resources quickly to complete projects faster.

- **Academic Index:** to find topics in other search engines such as Infotopia, Infomine, Bielefeld Search Engine, Open Doar and Chabot College.

- **BASE:** one of the world's most voluminous search engines especially for academic open access web resources.

- **CiteSeerx:** This is a scientific literature digital library and search engine that focuses primarily on the literature in computer and information science. CiteSeer was the first digital library and search engine to provide automated

citation indexing and citation linking using the method of autonomous citation indexing.

- **Google Scholar Beta:** search across many disciplines and sources like articles, theses, books, abstracts and court opinions, from academic publishers, professional societies, online repositories, universities and other web sites. Google Scholar helps to find relevant work across the world of scholarly research.
- **InfoMine:** Search virtual library of Internet resources relevant to faculty, students, and research staff at the university level. Librarians from the University of California, Wake Forest University, California State University, the University of Detroit – Mercy, and other universities and colleges have contributed in building InfoMine. It contains useful Internet resources such as databases, electronic journals, electronic books, bulletin boards, mailing lists, online library card catalogs, articles, directories of researchers, and many other types of information.

- **ipl2:** Covers collections of resources from the Internet Public Library (IPL) and the Librarians' Internet Index (LII) websites.

- **iSeek:** This is a targeted search engine that compiles hundreds of thousands of authoritative resources from university, government, and established noncommercial providers. It provides time-saving intelligent search and a personal Web-based library to help you locate the most relevant results immediately and find them quickly later.

- **refSeek:** web search engine for students and researchers that aims to make academic information easily accessible to everyone. RefSeek searches more than one billion documents, including web pages, books, encyclopedias, journals, and newspapers.

- **Vadlo:** holds the keys to everything scientific, including information about ELISA and other immunoassays, biomarkers, drug discovery and biotech

high-throughput screening bioassays, clinical trials and R&D, RNA interference, microRNA, miRNA, shRNA, siRNA oligoneucleotide, real time multiplex PCR primers and more.

Web, Library and Literary Tools:

- **Digital Library of the Commons:** The Digital Library of the Commons (DLC) is a gateway to the international literature on the commons. The DLC provides free and open access to full-text articles, papers, and dissertations.
- **Directory of Open Access Journals (DOAJ):** covers free, full-text, quality controlled scientific and scholarly journals and cover all subjects and languages through over 6313 journals in the directory. Currently 2746 journals are searchable at article level. Over 538958 articles are included in the DOAJ.

- **ERIC:** The Education Resources Information Center is an online digital library of education research and information. ERIC provides ready access to education literature to support the use of educational research and information to improve practice in learning, teaching, educational decision-making, and research.

- **Intute:** Intute is a free online service that helps to find web resources for studies and research.

- **Open Library:** To date, has gathered over 20 million records from a variety of large catalogs as well as single contributions, with more on the way. Open Library is an open project: the software is open, the data are open, the documentation is open, and they welcome contributions from users.

- **The Literary Encyclopedia:** The Literary Encyclopedia is an authoritative collection of specially commissioned articles written by scholars expert in their fields. It addresses literary works, writers, cultural movements and historical events around the world.

- **WorldCat:** This search tool allow to browse the collections of libraries in your community and thousands more around the world for popular books, music CDs and videos.

- **Archives:** Archives Hub, British Library Research Archive, Library of Congress, National Archives, are the archives useful for the academics.

Apart from this Search Engines like Ajaxwhois, FlickrStorm, FundooWeb, Keotag, Whonu, Similicio.us, for College Students can also be linked. Social networks resources also can be used for gathering information like Clipfire, Omgilli etc. The Best Search Engines linked to portal may be Google, Yahoo, Ask Jeeves, Alta Vista, Dogpile, Ebay, Exite, GigaBlast, Lycos, MSN, Netscape, WebCrawler, Wikipedia etc.

6.8. Sample image of Portal


AAPANSAARE
INSTITUTE OF MANAGEMENT & RESEARCH
About Us
Infrastructure
Programs
Faculty
Co-curricular
Events
Placements
Alumni
Achievements
Admissions
Gallery
Library Facilties
Books
Periodicals
E-journals
Information Gateway
Web Search Engine
General Information
Quick Reference
Subject Index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Faculty
Co-curricular
Events
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Alumni
Achievements
Admissions
Gallery
Information Gateway
College Resources
Internet Resouces
User ID: Username or Email
Password: Password
Forgot Password ?
Login
Back


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Google
Bing
YahooISearch
Ask
Aol Search
Wow
WebCrawler
MyWebSearch
Infospace
Info
DuckDuckGo
Blekko
Contenko
Dogpile
Alhea
Back


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Programs
Faculty
Co-curricular
Events
Placements
Alumni
Achievements
Admissions
Gallery
Information Gateway
General Search Engine
Yahoo: This search engine has been around for many years and is one of the most widely used.
Google: The most widely used search engine.
Duck Duck Go: Lists options when search terms have multiple meanings.
Kosmix: Divides results by categories, laid out with thumbnails.
Yebol: Results laid out in a tree diagram by category - or specify desired categories before searching.
Bing: Microsoft's latest attempt at a search engine.
Back

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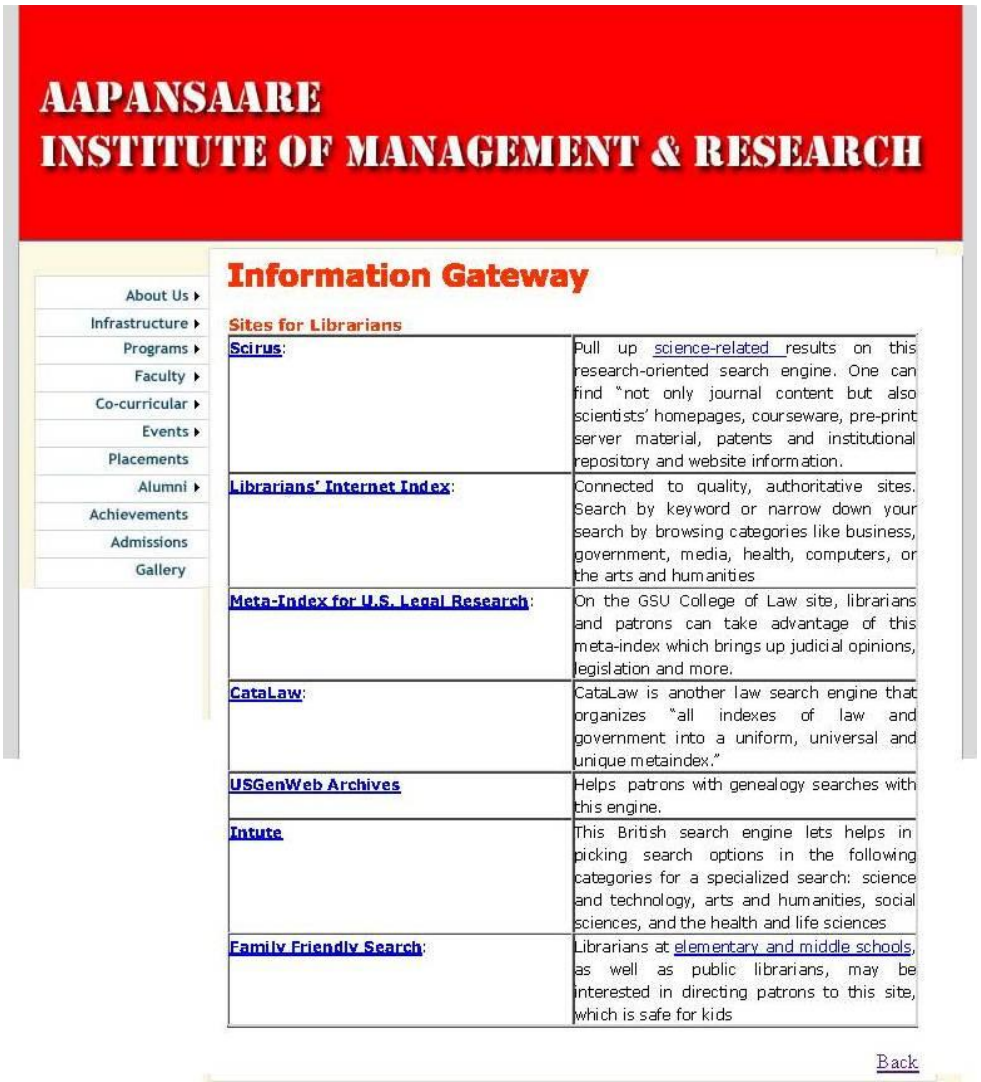
Infrastructure
Programs
Faculty
Co-curricular
Events
Placements
Alumni
Achievements
Admissions
Gallery

Information Gateway

Search Engines for Libraries

To understand the scope of research topic:	Intuite	Investigate annotated academic sites (advanced search)
	INFOMINE	Search annotated academic sites and subject databases (**advanced search**)
	Academic Info Subject Guides	Browse subject guides with descriptions of relevant sites
To see **related** topics	**Google**	Uncover buried sites using "related searches"
	Bing	Search for your topic, then drill down "related searches"
To **refine and narrow** research topic	SurfWax	Search for your topic, then click "Focus" (top) to show similar, broader, and narrower topics
	iSeek Education	Ask a question or search a topic in this database of "trusted resources" - use "targets" to refine search
	Wikipedia	Drill down "Contents" to explore subtopics
To choose a **controversial issue**	**Hot Topics (Google Custom Search)**	Begin your search on selective hot topic sites
	IDEA Portal	Browse or search a debate topic database with pro/con arguments
	Glean Comparison Search	Build your pro/con search using comparative terms (K-12)
To assess **background** on possible topics	Sweet Search	A selective search of Web information for students
	Wikipedia	Search this wiki (quality content is starred), then follow article links to more information
	Columbia Encyclopedia	Search basic factual information in this encyclopaedia (c 2000)
To find authoritative sites chosen by an expert researcher	INFOMINE	Librarian-selected scholarly sites
	Misguides	Librarian-created topic pathfinders
	Infotopia	Customized safe-search of educator-selected sites
To get **personal help** from experts	Ask an ipl2 Librarian	Get answers from volunteers and grad students in a week (K-12)
	All Experts	Ask your question of a self-identified volunteer subject-expert
	Ask a Librarian	Library research questions answered in five days (no homework questions)
To get **ranked or tagged** sites as valuable or relevant	Google	High PageRank means popular, relevant sites link to the page
	Technocratic	Browse or search user-identified subjects ("tags") for blog advice or opinions
	Ask.com	High Expert Rank indicates subject-specific popularity



6.9. Summary of the Chapter:

This chapter highlights the development of portal to connect the web resources. This helps librarians to build the concept of development of web portal.

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1) Konnur, P V and Kecherki, Umeshreddy (2008) Library Portal : Role of Librarian.
2) Portal Overview. Accessed at http://docs.oracle.com/cd/E13218_01/wlp/docs81/overview/overview_wlp.htm

CHAPTER-VII

FINDNGS, SUGGESTIONS AND CONCLUSION

CHAPTER-VII

FINDNGS, SUGGESTIONS AND CONCLUSION

It is suggested to all LIS Professionals to put efforts to get the Internet facility in the library. Though Internet is not a 100% substitute for Libraries, it should be used as an additional support source of information gathering. There are more than 3000 search engines, web directories, link lists, etc. are available on the Net. In order to provide efficient information seeking services from the Net, it is suggested that learning how to use search engines efficiently should be a central part of any Internet skills training. LIS schools should incorporate Internet use as one of the key subjects. Since there is lot of information available on the Web, it is highly recommended to formulate the query in a systematic way and make maximum usage of Advance Search Options of Search Engines to retrieve the right information in order to fulfill Dr. S.R. Ranganathan's Fourth Law "Save the time of the Reader".

It is observed that 50 percent of LIS Professionals are using fundamental search features like Boolean Operators only. It is strongly suggested to make maximum usage of Advanced Search Options like Language, Date, File Format, Domain or URL, Countries, etc. For example, if "Language Option" is selected in Google itself, the information is available in more than 100 languages. Similarly if the "Date Option" is used, then the information of a particular year can be retrieved. It is suggested to register one's own websites with all Search Engines so that the information seeker may not miss the information contained in the website.

Best Practices : Searching on Net

Best Practices to be followed while searching information on Interent using search engines are:

- Always keep in mind use, who, what, where, how and why while formulating the query. This may add flavor in searching and assist in providing pinpointed search.
- In queries do not use articles, pronouns, conjunctions or propositions in language.
- The keywords in queries most often be nouns
- Truncation or word stemming helps keyword count down and makes for simpler queries.
- Use synonyms to find the right "level" for query subject and to ensure proper coverage.
- Always look for natural phrases in query concepts – they are one of the most powerful weapons for searching
- AND can be used more frequently as Boolean operator. Use OR to string together synonyms. NOT is a powerful operator, and proper care must be taken.
- Avoid complicated nesting with too many parentheses; they can sometimes give results you did not intend.
- Use multiple search services for an important query. Use search engines with full-text indexing and Boolean support for the most demanding queries.
- Avoid misspelling, redundant terms, ignored terms and special characters, improper Boolean and complicated nesting.
- Use the plus (+) and minus (-) signs in front of words to force their inclusion and/or exclusion in searches.
- Use double quotation marks (" ") around phrases to ensure they are searched exactly as is, with the words side by side in the same order.
- Type keywords and phrases in lower case to find both lower and upper case versions. Typing capital letters usually return only an exact match.

7.1. FINDINGS:

General:

- Internet is the largest store house of information.
- There are different search tools available over the net for searching information viz. search engines, meta search engines, subject directories, and invisible web
- It is found that variety of results are retrieved when using different search tools.
- The use of search engines may not be as precise as other tools and many hits may results.
- To narrow down the hits information searching skills are to be acquired by the users.
- Web is treated as an excellent tool for cutting edge information but many limitations are visualized in web searching.
- There are millions of documents written and available before internet and they are not covered in the search. Similarly older, historical documents are not available on web.
- Most of the information available on the web is in from the public domain and only published in digital form.
- Not everything is free on the net or web there are many fee based information resources and web sites on the net and not accessible to common users.
- digital databases, numerical databases, commercial databases are generally charges and not available to free users
- web pages available on the net are not in a permanent from they are volatile.
- The web addresses or URL of the web page may change and creates locating later unless reference is provided.
- The administrator of the web decides y=the retention period of the web page on the net.
- Anyone can publish web page on internet and have its authenticity and standardization in question
- Web may provide initial basic information on the topic but not place to start for research.

- Web page is a global, interactive, dynamic available on the internet
- The use of Boolean operators helps in broadening or narrowing the searches . AND operator requires both terms to appear in the documents retrieved. OR requires either terms to appear in items that are retrieved. Not excludes the term.
- There are no editors and authorities to maintain the net as well no guarantee that the site find may get again after few days.
- More search engines are used by the age group of 29 and above, and the English is the preferred language of search.
- The Google is highest used search engine followed by Yahoo, Alta Vista, Lycos, and least used search are HotBot, Inforssek, Excite etc.

Specific:

- Types of search engines are Crawler based search engines Directories Specialty search engines, Hybrid search engines, Meta search engines, etc ,
- Specialty search engines helps the user in searching different areas in specific types of lists that are specialized in specific topic that would be beneficial for narrowing down the searching process. Examples:- Askjeeves (Question and answer search engine)- Medhunt (Provides only medical information)
- Hybrid search engines are search engines that use both crawler based searches and directory searches to obtain their results. Example:- Yahoo.com-Google.com
- Meta search engines are search engines that combine all the results from other search engines into one big list. Examples:- Metacrawler- Dogpile
- In this study, relevancy comparison of four world wide web search services, which are commonly called "search engines" have been made. These selected search engines are-Google, Altavista, Teoma and Alltheweb. The set of one dozen search statement is used from three subject fields. The relevancy was measured on the basis of first ten search results provided by each of the search engine.
- For the ease of analysis and interpretation the collected data have first been divided into two categories viz: The First Five Output (FFO) and the Last Five Output (LFO) and have been measured in terms of Relevant (R), Partially

Relevant (PR), Distant Relevant (DR) and Irrelevant (IR). In all cases, when the web page could not be opened, due to any reason, it has been categorized as Page Not Found (PNF). In this way all search output has been calculated, analyzed and results are drawn.

- With a view to measure the currency of collected data all output provided have also been analyzed. While collecting data the date of posting the web page and its data of update has been noted. To decide the currency of web pages the positing date of web page or the date when web page has been updated has formed the basis. In all cases when the date of update is not available the date of posting the web page has been chosen. But where revision date is given, it is selected as the currency of web page. For the ease of calculation and analysis the currency period has been categorized into four groups viz: 2006-2005, 2004-2003, 2002-2001 and 2000- Earlier. However, while analyzing the collected data it has been found that a large number of web pages are neither having the date of positing nor the date of revision or update. All such cases have been categorized as Currency Not Available (CNA). This has created five categories of currency of web pages.
- It is important to note that all search engines boast to arrange the search results on the basis of their relevancy to the search statement, and it is commonly accepted that search engines with big size Index provides higher number of total results and their relevancy is also higher in comparison to others. Present study has found that Search engines with smaller index also have provided more current and relevant results than the search engines with bigger index.
- In Library and Information Science (LIS) subject field search using different search engines analysed that Google has provided the maximum output of (45,177,500) results, followed by Altavista (2,346,500) results and Alltheweb followed it (with 2,148,000 results). Teoma has provided the minimum output of (448,650) average results.
- As far as relevancy is concerned Google, (has provided 30%R, 27.5%PR, 22.5%DR, 17.5%IR and 2.5%PNF results) Altavista, (has provided 35%R, 12.5%PR, 20%DR and 32.5%IR results.) Teoma, (has provided 32.5%R, 17.5%PR, 15%DR, 27.5%IR and 5%PNF results), Alltheweb (has provided 42.5%R, 15%PR, 15%DR and 27.5%IR results) are in ranks. Thus it can be

easily said that search engine Alltheweb provides the maximum of 42.5% relevant results. A close analysis shows that for relevant web pages one should use Alltheweb, particularly in the field of LIS. All three search engines except Google have provided more relevant results in first five output where as Google has provided equal relevant results in first five output and the last five output.

- In terms of average currency in LIS Teoma has provided the maximum (30%) current results posted/updated followed by Alltheweb (27.5%) and Altavista (25%). Google has provided the minimum (20%) current results posted/updated.
- Similarly, in terms of pages where date of posting/update is not available Google on an average has provided the maximum (37.5%) results, followed by Altavista (35%), Alltheweb (30%) and Teoma with minimum (27.5%) results in LIS.
- In Environmental Science Google has provided the maximum output of 1,720,500 results, followed by Altavista with total output of 595,250 results and Alltheweb with total output of 539,250 results. Teoma has provided the minimum total output of 89,150 results. In terms of relevancy Google has provided 40%R results, 25%PR results, 17.5%DR results, 15%IR results and only 2.5%PNF results. Altavista has provided 42.5%R results, 32.5%PR results, 10%DR results, 12.5%IR results and 2.5%PNF results. Teoma has provided 37.5%R results, 32.5%PR results, 7.5%DR results, and 22.5%IR results. Alltheweb has provided 42.5%R results, 32.5%PR results, 10%DR results, 12.5%IR results and 2.5%PNF results. Thus it is clear that Alltheweb and Altavista both have provided not only equal 42.5%R results but have also provided equal results in all other category of relevancy. A close analysis shows that to find relevant information in environmental science one should use either Altavista or Alltheweb.
- Except Teoma all other three search engines have provided more relevant results in first five outputs whereas Teoma has provided more relevant results in last five outputs.
- As far as currency of web pages are concerned in Environmental Science Google has provided the maximum of 32.5% output posted/updated in the year

2005-2006, followed by Teoma with 30%, output and both Altavista and Alltheweb have provided only 25% output.

- Similarly, in terms of pages where date of posting/update is not available again Google has provided the maximum of 35% output, followed by both Altavista and Alltheweb with 30% output and Teoma with minimum of 25% output. Google, Altavista and Alltheweb have provided 17.5% output posted/updated in 2003-2004 whereas Teoma has provided only 12.5% output for the same period. However, Google, Altavista and Alltheweb have provided 7.5% output posted/updated in 2001-2002 whereas Teoma has provided 17.5% output for the same period.
- In Social Sciences also Google has provided the maximum output of 15,200,000 results, followed by Altavista with total output of 7,896,250 results, and Alltheweb with total output of 6,760,500 results. Search engine Teoma has again, provided the minimum total output of 1,232,600 results.
- In terms of relevancy Google has provided 45%R results, 25%PR results, 15%DR results and 15%IR results. Altavista has provided 30%R results, 25%PR results, 35%DR results and 10%IR results. Search engine Teoma has provided only 15%R results, 32.5%PR results, 32.5%DR results, and 15%IR results. Alltheweb has provided 32. 5%R results, 22.5%PR results, 30%DR results and 15%IR results. Thus a close analysis shows that to find relevant and current information in Social Science one should use either Google or Alltheweb.
- Google has not provided any www link which is not working. Altavista and Alltheweb have also not provided any www link which is not working. Teoma is the only search engine which has provided 5% such www links which is not working.
- Except Google rest three search engines on average have provided more relevant results in the last five outputs. Goggle has provided more relevant results in first five outputs.
- As far as the currency of web pages are concerned in Social Sciences, Teoma has provided the maximum 40% output posted/updated in the year 2005-2006, followed by Google with 37.5% output and both Altavista and Alltheweb with 25% output of the same period.

- In terms of web pages where date of posting /update is not available three search engines namely Google, Altavista and Alltheweb has provided equal 32.5% output. Teoma has provided the minimum 20% output of such web pages.

7.2. SUGGESTIONS:

1) Web search engines are nothing but databases containing records of web pages. Different search engines contain different web pages and no one search engine covers the entire Web information. Search software also varies between them, it is often useful to users to check the "help" page for specific search engine features to find out how to conduct a more effective search. Librarians have to initiate orientation in this direction.
2) For improving information search in libraries using search engines library professionals need to develop list of simple commands and list of search engines in the respective subjects and display it in the Internet lab. In simple search field search, subject search, keyword search, author search etc can be used. In advanced search Boolean operators, truncation search (Root search), federated search, specified key terms in quotes etc are displayed with examples.
3) A list of subject based search engines, and meta search engines can be prepared and displaced for the users. This helps users in getting immediate access to information. A comparison of special search features can also be highlighted in the lab.
4) Search engines are not one-size-fits-all, and often finding the best result means starting in the right place. Don't limit searches using only Google, Yahoo and Bing; especially for academic research these are very common search engines might not be the best solution. Use specific academic support search engines like Google Scholar, Scirus, etc.
5) A search engine is not human, and cannot perform search properly unless proper words and phrases entered into it, hence while searching prepare a list of standard keywords and submit. Choosing and feeding words or key terms wisely is important in searching information to avoid garbage.

6) Librarians can arrange tutorial classes for using effective search engines for the users. This helps users in tracking the related information with the help of professional assistance.
7) Every user of search engines have to know the limitations and features of the web search engine. Every web search engine has its own merit and demerit. It is to be leant and practiced for better information retrieval.
8) For effective searching on the net before searching think for what is needed and plan for effective search strategy, Since web is not a place to get to initially research activity it can only be used as supplementary tool to update information after using primary literature or secondary literature , commercial databases etc.
9) Evaluation of web pages and its contains is essential. compare and contrast related information from other sources also to validate the searched data on the net.
10) While searching on net and web pages using search engines, use always unique words, terms, phrases as well as synonyms, quotation marks, question marks, etc tpo search for specific phrases.

The researcher has made efforts in this research study to fulfil the objectives decided and discussed satisfactorily in the different chapters. Since no study is complete in all aspects there is a scope for further research. The researcher would like to suggest the scope for the future research that some more analytical studies may be conducted using specific subject based web search engines, which can be useful for different subject users and also compare the results of the different search engines considering few terms in practice. Factual studies may help in isolating the search engines area wise.

7.3. CONCLUSION:

With the development of the World Wide Web, the "information search" has grown to be a significant business sector of a global, competitive and commercial market. Powerful players have entered this market, such as commercial internet search engines, information portals, multinational publishers and online content integrators. Libraries see themselves as central information providers for their clientele, at universities or research institutions. Looking at the practice of today's digital library

portals the impression about internet is useful in the academic resource discovery environment. Along with this online library catalogues, electronic journals and e-books, databases are well known for a long time. Content is generally delivered through well-established service channels by publishers, book-houses or subscription agencies. The digitisation of print resources, e- publishing and the advent of the World Wide Web have resulted in the proliferation of a vast amount of content types and formats that include, digitised collections, faculty and research groups' websites, conference web servers, preprint/e-print servers and, increasingly, institutional repositories and archives, as well as a wide range of learning objects and courses. If these resources are registered by a library then they are in the form of separate lists of links or databases, but are not integrated into local digital library portals.

APPENDIX-1

TOP 50 SEARCH ENGINES

Top 50	List of Popular Search engines	Submit Your Website to 50 best Search Engines
1	**Google**	https://www.google.com/webmasters/tools/submit-url
2	**Yahoo**	https://ecom.yahoo.com/dir/submit/intro/
3	**Bing**	https://ssl.bing.com/webmaster/legacy/submitsitepage.aspx
4	**ASR**	http://www.activesearchresults.com/addwebsite.php
5	**Scrub the Web**	http://www.scrubtheweb.com/addurl.html
6	**EntireWeb**	http://www.entireweb.com/free_submission/
7	**Anoox**	http://www.anoox.com/add_for_indexing_free.php
8	**Amfibi**	http://addurl.amfibi.com/
9	**Web World**	http://www.webworldindex.com/
10	**SoMuch**	http://www.somuch.com/AddSite/SubmitMain.asp
11	**Gigablast**	http://www.gigablast.com/addurl
12	**Skoobe**	http://www.skoobe.biz/
13	**01 Web Directory**	http://www.01webdirectory.com/
14	**What You Seek**	http://www.whatuseek.com/addurl-secondary.shtml
15	**Illumirate**	http://www.illumirate.com/
16	**Surfsafely**	http://www.surfsafely.com/urladd.html
17	**OneMission**	http://onemission.com/
18	**Search sight**	http://searchsight.com/submit.htm
19	**Fyber Search**	http://www.fybersearch.com/add-url.php
20	**Link Center**	http://linkcentre.com/
21	**Infotiger**	http://www.infotiger.com/addurl.html
22	**Submit**	http://www.submit.biz/
23	**Wikiweb**	http://www.wikidweb.com/
24	**Business Seek**	http://www.businessseek.biz/page.php?page=submi

Top 50	List of Popular Search engines	Submit Your Website to 50 best Search Engines
		ssion-policy
25	**TXT Links**	http://www.txtlinks.com/
26	**The Living Link**	http://www.thelivinglink.net/submit.php
27	**Polipat**	http://polypat.org/submit.php
28	**Infolistings**	http://www.info-listings.com/submit.php
29	**R directory**	http://www.rdirectory.net/submit.php
30	**The great directory**	http://www.thegreatdirectory.org/submit.php
31	**9Sites**	http://www.9sites.net/addurl.php
32	**1WebsDirectory**	http://www.1websdirectory.com/
33	**Sonicrun**	http://search.sonicrun.com/freelisting
34	**Finest4**	http://www.finest4.com/submit.php
35	**OneMilliondirectory**	http://www.onemilliondirectory.com/submit.php
36	**Synergydirectory**	http://www.synergy-directory.com/submit.php
37	**Elite sites directory**	http://www.elitesitesdirectory.com/
38	**Spiffy search**	http://www.spiffysearch.com/
39	**Amidalla**	http://www.amidalla.de/
40	**Boitho**	http://www.boitho.com/
41	**Exact seek**	http://www.exactseek.com/
42	**Tower search**	http://www.towersearch.com/
43	**Secretselabs**	http://www.secretsearchenginelabs.com/
44	**Setooz**	http://www.setooz.com/
45	**Bimeon**	http://www.bimeon.com/
46	**Dramba**	http://www.dramba.com/
47	**Piseries**	http://www.piseries.com/
48	**Intelseek**	http://www.intelseek.com/add_url_form.asp
49	**Domaining**	http://www.domaining.in/submit.php
50	**Acoon**	http://www.acoon.com/
This List of Popular Search Engines 2012 is Prepared by:		http://topbestlisted.blogspot.in/2011/08/worlds-top-10-best-popular-search.html

APPENDIX-2

LIST OF TOP 20 SEARCH ENGINES

A web search engine is software code that is designed to search for information on the World Wide Web. The list of top 20 search engines mostly used by online users are placed in the following table.

No.	List of search engine		
1	**Google**	:	(Url: www.google.com)
2	**Bing**	:	(Url: www.bing.com)
3	**Yahoo!**	:	(Url: www.yahoo.com)
4	**Ask**	:	(Url: www.ask.com)
5	**AOL**	:	(Url: search.aol.com)
6	**MyWebSearch**	:	(Url: www.mywebsearch.com)
7	**Blekko**	:	(Url: www.blekko.com)
8	**HotBot**	:	(Url: www.hotbot.com)
9	**Lycos**	:	(Url: www.lycos.com)
10	**Dogpile**	:	(Url: www.dogpile.com)
11	**Webcrawler**	:	(Url: www.webcrawler.com)
12	**Alta Vista**	:	(Url: www.altavista.com)
13	**Overture**	:	(Url: www.overture.com)
14	**Excite**	:	(Url: www.excite.com)
15	**Bonzi**	:	(Url: www.bonzi.com)
16	**Netscape**	:	(Url: www.netscape.com)
17	**Planet Search**	:	(Url: www.planetsearch.com)
18	**SNAP**	:	(Url: www.Snap.com)
19	**Infoseek**	:	(infoseek.go.com)
20	**ComFind**	:	(Url: www.comfind.com)

APPENDIX-3

SEARCH ENGINES

No.	List of search engine
1	**ABC Search engine** - every search starts with ABC
2	**Academic Search**. It's from Microsoft, so it's got to be great. Hasn't it?
3	**Acronym finder** - for over 750,000 human edited definitions
4	**Addictomatic** Great for quick results in a modular format. I like it, except the stupid logo!
5	**Alexa** is good for finding information on the top 100k sites
6	**AllPlus** - meta search and discovery engine
7	**Answers** is the world's leading Q&A site
8	**AOL Search no**, I didn't think it was still going, but it is
9	**Around People Finder**. UK, US, Australia, Europe emphasised.
10	**Ask (Jeeves)** still limping along, shadow of its former self
11	**Ask** if you want the US/global version
12	**Azoos** is the brightest yellow search engine out there
13	**Bananaslug** Run a search and include a random word, just to see what you get!
14	**BASE** for academic search. 56 million+ documents
15	**BBC Video Nation,** with categories, features and local information
16	**Behold** for flickr images
17	**Betterwhois** gets you good accurate information on domains
18	**Bing**. Microsoft's faint Google lookalike.
19	**Biographies.ne**t is an excellent source to identify biographical information.
20	**Blekko** is a good alternative to the big 3. Definately try it.
21	**Blindsearch** to compare results of major engines
22	**Blinkx** is a video search engine, with 35 million hours of it!
23	**Blippex** is for private searching. They don't track you.
24	**Carrot2** is a clustering engine - great for focussing on a subject area you're

No.	List of search engine
	not sure of
25	**ChaCha** allows you get other people to help with your search
26	**Clipblast** searches for videos for you. Not personally stunned by it.
27	**Cluuz** A visual search engine
28	**Collarity** for personalised searching across different types of data
29	**CompletePlant** for 70k of searchable databases. Good for deep web
30	**Country search engines** is my list of 4,000 engines for 200+ countries
31	**Creative Common search**. Great for finding stuff you're allowed to use. Worth using!
32	**CriticalPast** for vintage stock footage and royalty free material.
33	**DailyEarth** US newspaper emphasis.
34	**Dailymotion** for videos - emphasis on UK based content
35	**Daybees** the worlds largest events search engine, so they say.
36	**Definitions** is good for thousands of definitions
37	**Deepdyve** for deep web searching
38	**Digital Librarian**; a librarian's choice of the best of the web
39	**DMOZ** for a hierarchical directory, old but still good
40	**Dogpile** for multisearch of Google, Yahoo, Ask & Bing (GYAB)
41	**Draze** to compare Google, Yahoo and Bing
42	**DuckDuckGo** is a family safe engine
43	**Eatbydate** tells you if food is safe to eat. This engine could save your life! Maybe.
44	**Ehow** searches for crafty type material and 'how to' stuff. Random and interesting
45	**Entireweb** is a freetext search engine
46	**Exalead** is an excellent alternative to Google
47	**Excite** is there, but does anyone use it any more?
48	**Factbites** where results make sense
49	**FaganFinder** is a superb collection of search resources
50	**Fefoo** multi search engine with access to 250+ search engines
51	**Findanyfilm** available in the UK in any format

No.	List of search engine
52	**FindSounds** for sound effects
53	**FindThatFile** for documents, audio, video, zip, archives and so on.
54	**FinQoo** is an underwhelming meta search engine
55	**Galaxy** is a directory based search engine
56	**Gigablast** is a good second string search engine. Worth trying.
57	**Goofram** for Google and Wolfram Alpha
58	**Google** doesn't need any words from me
59	**Great PDF** search engine - does exactly that - PDF search
60	**Harvester42** Straightforward multi search engine, covering about 50 different resources divided into 16 different categories.
61	**hashtagify.me** This is a nice little search feature for hashtags on Twitter.
62	**Hshtags** A social media search engine dedicated to hashtags
63	**Headlinespot** News like it's 1999!
64	**Heapr** for Google, Twitter, Wolfram Alpha, Wikipedia
65	**Hotbot** is a blast from the past and that's about all
66	**Hunch** is a decision engine, which works very well indeed
67	**iBoogie** is a clustering meta search engine
68	**Icerocket** has RSS feed options and is a good alternative
69	**IMDB** the Internet movie database for movies, tv, actors, showtimes. Invaluable
70	**Info** Google, Yahoo, Bing, Yandex, all in one place.
71	**Infomine** for scholarly data, and is excellent
72	**Infonary** Very sparse. Not a top choice for me.
73	**Info Service** is quirky and very colourful. Odd directory though
74	**Internet Archive** to see all those old pages!
75	**Intute** for academic resources. First class service
76	**Irazoo** search, win gift cards. I want to search, not win $5
77	**Iseek** is a clustering search engine; very good too
78	**Ixquick** is an excellent metasearch engine
79	**Izito** Combines 'all' search engines. Err, no, it doesn't.
80	**Jurn** is a curated academic search engine indexing 4.5k free ejournals in

No.	List of search engine
	the arts
81	**Kedrix** Why search when you can mearch? Don't ask me, I just find this stuff.
82	**KidsClick** is websearch for children by librarians
83	**KidRex** is another children's safe search engine
84	**Kngine** styles itself as a Web 3 semantic web search engine
85	**Knowem?** Search over 550 social networks for brand and user names
86	**Lanyrd** Need to find a conference, event or speaker? This'll help out
87	**Librarians' Internet Index** is a brilliant resource
88	**LocateTV** find shows, actors and movies
89	**Lyrics** is a great search engine to find those song lyrics. V. Good.
90	**Lycos** is still out there, but getting old and creaky
91	**Macroglossa** Visual search engine Upload image, see what it finds
92	**Mahalo** for social search, human created information resources
93	**Mamma** is the mother of all meta search engines
94	**MetaCrawler** is a meta search engine
95	**Millionshort** all the results, except the top million or so. Interesting take on search
96	**MrSapo** Multi search engine, lots of options, very sparse SERP though.
97	**Monstercrawler** for a GYAB search
98	**Motherpipe** - no tracking, no cookies, just search
99	**Mundusearch** for web, sounds, lyrics, music and video
100	**MyAllSearch** You can choose from Google, Yahoo, Bing, Ask (Jeeves), Yandex, Lycos, Metacrawler, Entireweb and DuckDuckGo.
101	**Newseum** 772 front pages from 80+ countries.
102	**Newslookup** Latest news headlines, emphasis on US but also global content
103	**Newsmap** Great tool; news arranged by colour and size. Try it! NewsNow Emphasis on the UK news.
104	**Numberfetch** for landline and freephone numbers instead of the pricy premium rate ones
105	**OAIster** for academic material that's otherwise hard to find

No.	List of search engine
106	**OmniMedicalSearch** is a top notch medical search engine
107	**OnlineCasinos.com** Arranged by location, type, games, reviews etc
108	**Oolone** is a graphic search engine; quite pleasing to look at and use.
109	**Opening TV Themes**. Yes, it is real. Yes, you will lose hours of your life happily humming
110	**Panabee** for comparing results from different search engines
111	**Pepesearch** for freetext and directory search. Not impressed
112	**Phrases.net** for common phrases, casual expressions and idioms
113	**Pipl People finder**. Good as the rest, which means not any better.
114	**PolyMeta** is an intelligent metasearch and clustering engine
115	**PublicRadioFan** for searching for radio stations.
116	**Qrobe** for Google, Yahoo/Bing and Ask
117	**Questfinder** is a selective web directory
118	**Quixey** Want apps? This has apps in abundance!
119	**Quotes.net** for famous and not so famous quotations
120	**Quintura** for visual search in a word/tag cloud for children.
121	**RealMoneyPoker** offers an online Texas Hold'em legality search engine
122	**Redz** for visual search - an arch of webpage thumbnails
123	**References** is a good source of reference resources
124	**ReferrerCode** - An Online Games Bonus Code Search Engine
125	**Re-QUEST** is a directory based engine
126	**Rhymes.net** is an excellent search engine for finding words that rhyme, with translation and pronounciation options as well.
127	**RocketNews** Bit of a dud - very repetition, but global
128	**ScienceHack** for science videos verified by 'a scientist'
129	**Scour** to search socially, see community votes and comments
130	**Searchbug** for people and company search in the US
131	**Search** is a multi search engine. Not stunned by it
132	**Searchboth** lets you compare results for 9 different engines
133	**Searchbots** is a 'build your own' resource
134	**Searchdazzle** puts 4 engines on one page. Messy!

No.	List of search engine
135	**Searchhippo** is another multisearch engine that doesn't excite me
136	**SearchLion** covers Web, images, news, video, blogs, twitter. Nice and easy, with a nice blended approach.
137	**SearchMedia** is a UK medical search engine for professionals
138	**Searchthenet** is a multisearch engine - 20 engines offered
139	**SearchtheWeb** is a directory engine which fails to impress
140	**Sency** for real time, what's happening this moment information
141	**Similar-site** finds similar sites to that which you provide
142	**Similarsites** finds similar sites to that which you provide
143	**Similicio.us** finds similar sites to that which you provide
144	**Silobreaker** is the #1 news site out there, bar none
145	**Siteslike** is a find similar sites engine
146	**SlideFinder** searches for Powerpoint presentations
147	**Slider** is a full text search engine that searches DMOZ
148	**SmartLinks** provides quick links in a directory structure
149	**SnapBird** for Twitter searching
150	**Snappyfingers** is a Q&A database, searching FAQs.
151	**Socialmention*** A king of real time social media search and analysis
152	**Soovle** for Google, Wikipedia, Answers, YouTube, Ask, Yahoo, Amazon
153	**Soundclips** for uh.. clips of y'know, sounds and stuff.
154	**SoundJax** for clips of sounds. Loads of sounds.
155	**Soungle** for even more sounds.
156	**Spacetime 3D** looks very similar to Redz; visual search engine
157	**Spezify** for multisearch visual results
158	**Sputtr** - lots of tiles for multi searching.
159	**Stilltasty** is a food date/edibility search engine
160	**Surfcanyon** is a general engine
161	**Sunsteam** is a directory engine, now 10 years old
162	**Sweetsearch** evaluated sources designed for students
163	**Symbols** is about signs, flags, glyphs, excellent arrangement, top resource
164	**Synonyms net** is the webs most comprehensive synonym resource

No.	List of search engine
165	**TeacherTube** for safe and education YouTube videos
166	**Technorati** for blog search
167	**TellyAds** has over 17K recent tv ads available to search.
168	**The Net 1** is a directory engine
169	**The Paperboy** Front pages of newspapers. Great for news freaks.
170	**TopSite** Find the best 10 top websites for almost any subject
171	**Topsy** Want tweets? They have 425 billion of them. The place to go to search Twitter
172	**Trooker** is a great video search engine resource
173	**Trovando** - first class multi search engine, though some choices are very outdated now.
174	**True Knowledge** "is a pioneer in a new class of search technology that allows you to ask questions on the web, just as if you were talking to another human being. Renamed as Evi
175	**Turboscout** is an excellent multi search engine
176	**USZip** provides excellent factual information on US zip code locations.
177	**Vimeo** is another YouTube lookalike video search engine
178	**Wayback machine** to go way back to 1996 for examples of archived pages. Invaluable
179	**WebCrawler** is a meta engine for GYAB
180	**Web-Search** is a multi search engine that offers 18 resources
181	**WebWorld** for quality sites on the web, in a directory style
182	**Whostalkin** Who is talking, not stalking. Though as its a social media engine, who knows?
183	**Wink People Finder**. Emphasis on US, but over 400 million profiles
184	**Wolfram Alpha** is a computational search engine; good but different!
185	**Worldcat** find 2 billion items in libraries near you. (Near being a relative term)
186	**Worldnews** News from around the world. Fancy that.
187	**WWW Virtual Library** for directory listing of virtual libraries
188	**Yabigo** searches Yahoo, Bing and Google
189	**Yahoo** needs no introduction either

No.	List of search engine
190	**Yandex** is Russian based, but don't let that put you off, it's a good alternative to Google
191	**Yippy** is 'family friendly' which means badly censored to the point of being actively unhelpful.
192	**Yometa** takes the results from Google, Yahoo and Bing and displays them in a Venn diagram
193	**YouTube** is for videos, but you knew that already
194	**Zakta** is a personalised search engine resource
195	**Zanran** helps you to find 'semi-structured' data on the web.
196	**Zapmeta** searches all the major engines
197	**Zeekly** for private searching. Nothing kept or stored, including IP addresses
198	**10x10** 100 words and pictures that define the time. Unique and interesting.
199	**123 people** is a UK people search engine
200	**48ers** Real time social search.

(Source: Web search engines http://www.philb.com/webse.htm)

SEARCH ENGINES

GENERAL SEARCH ENGINES | META SEARCH ENGINES

Visit **How to Choose a Search Tool,**
a more extensive list of search tools organized by features.

General Search Engines

No.	List of search engine
1	**Alexa Web Search** - analyzes site traffic including ranking, global users, pages linking to the site, and links to related pages of interest
2	**Ask.com** - general search engine enhanced by a number of specialty searches including a dictionary, thesaurus, currency converter, encyclopedia, maps, news and more
3	**Bing** - Microsoft engine that displays excerpts from sites retrieved by your search and offers related search suggestions; multimedia and other deep Web results are also displayed. Also check out **Bing Maps**.
4	**Blekko** - retrieves results from trustworthy sites and offers filtered searching with the use of **slash tags**, e.g., global warming /climate; can sort results by relevance or date; allows searchers to integrate their Facebook newsfeed into search results
5	**ChaCha** - offers live human guides to help answer queries; focuses on questions from mobile devices
6	**Exalead** - offers concept clustering of results, thumbnail images of retrieved sites, and customization options such as organization of results by file type, geography or modification date
7	**Factbites** - searches for full topic matches and returns meaningful, full sentence excerpts of sites in its results list
8	**FindFiles.net** - searches for all **MIME types** found on the Web, for example audio, video, images, software, PDF files, text documents, cascading style sheets, xml documents and zip archives

No.	List of search engine
9	**Google** - Web's most popular search engine that retrieves results in real time as you type your search. Also check out **EcoSmartSearch.com**, a Google-powered search engine with a black background display that saves energy. Google offers a number of **Services** that are worth exploring, including: **Google Blog Search**, for searching blog entries **Google Book Search**, for searching the full text of books from most publishers in the U.S. **Google Directory**, for searching the Google version of the Open Directory **Google Scholar**, offers the full text, abstracts, and/or citations to scholarly materials including books, journal articles, documents in academic repositories and the free Web. This link will allow you to access the full text of articles in journals to which the Libraries subscribe when you are off campus. **Google U.S. Government Search**, a searchable database of U.S. government Web sites (.gov and .mil) ranked by link popularity
10	**Hakia** - organizes results into types of information sources, including "credible " sites recommended by librarians
11	**iSEEK Education** - offers authoritative resources from university, government, and established noncommercial providers; organizes results into concept clusters, and also allows users to recommend and rate sites
12	**Lycos** - general search engine that also offers searches of a few deep Web content sources including people look-up, yellow pages, and multimedia
13	**Quintura** - displays a type of tag cloud with keywords related to your search that can be selected to generate new results
14	**SearchEdu.com** - service that limits results to the .edu, domain; also offers to search well-known dictionaries, encyclopedias, almanacs, etc. See also: **SearchGov.com** - .gov domain **SearchMil.com** - .mil domain **SearchTeam** - real-time collaborative search engine that allows you to search, save results, and collaborate with invited others; you can comment, chat, share documents and links, etc. to create a useful SearchSpace on any

No.	List of search engine
	topic; integrates with such social networks as Facebook, LinkedIn and Twitter **SnappyFingers** - searches millions of Frequently Asked Questions (FAQs) for answers to user queries **Wolfram|Alpha** - enter a question or calculation, and Wolfram|Alpha uses its built-in algorithms and own collection of data to compute the answer **Yahoo!** - portal with a general Web search and many other content services **Zanran** NEW - searches for data and statistics found in graphs, tables and charts; hover your mouse over the item icon for a preview

Meta Search Engines

No.	List of search engine
1	**43 Marks** - offers separate searches of Google, Yahoo!, Bing and Wikipedia with a one-click toggle between search results; also serves as a personal home page for collecting bookmarks
2	**Browsys** - offers Search Assistant for searching numerous sources including the social and the deep Web; Virtual Folders allow users to create, save and bookmark custom folders containing up to 12 favorite sites
3	**Cacti Search** - search Google, Yahoo, MSN and Ask, and retrive a collated results list with an option to view results from each engine separately
4	**Dogpile** - search numerous search engines and presented collated results; also presents concept clusters for viewing results organized by keywords or topics
5	**iBoogie** - offers searches of the Web and multimedia, and supplies real-time concept clustering of results
6	**Ixquick** - ranks results based on top ten rankings from the source sites; allows any type of search syntax and will translate and direct your search accordingly

No.	List of search engine
7	**Mamma** - retrieve results from numerous sources; also offers search suggestions related to your search
8	**MetaCrawler** - retrieve results from Google, Yahoo!, Bing and Ask; also offers search suggestions related to your search
9	**Searchzooka** - offers advanced search options on Google, Yahoo!, Bing, Ask, Digg and Technorati with a single mouse click; users can save searches for future use, organize the searches into folders, and clone new searches from existing ones
10	**SortFix** - conduct a search, then drag suggested search terms into a box to add to your search; also drag terms to remove them from your search or do a dictionary definition lookup; searches Google, Bing and Bing Images, Twitter and YouTube
11	**URL.com** - returns the top ten results from Google, Yahoo! and MSN, and allows users to comment on and vote on the results
12	**Virtual Learning Resources Center** - searches several high quality directories; also offers its own directory
13	**ZapMeta** - searches a handful of sources, and offers concept clusters for organizing search results
14	**Zuula** - searches the Web, images, news, blogs and jobs postings, and returns results from multiple search tools in configurable separate tabs

APPENDIX-4

ACADEMIC DATABASES AND SEARCH ENGINES

Source : Wikipedia, the free encyclopedia at http://en.wikipedia.org/wiki/List_of_academic_databases_and_search_engines and at http://www.viniti.ru/download/russian/conf/DOP/3.pdf

Name	**Discipline(s)**	**Description**	**Access Cost**	**Provider(s)**
Academic Search	Multidisciplinary	Several versions: Complete, Elite, Premier, and Alumni Edition[1]	Subscription	EBSCO Publishing[2]
Aerospace & High Technology Database	Aerospace, Aeronautics, Astronautics		Subscription	ProQuest[3]
AJOL: African Journals OnLine	Multidisciplinary	Scholarly journals published in Africa[4]	Free abstracts; Subscription full-text	African Journals OnLine[5]
AgeLine	Sociology, Gerontology	Includes information on aging-related topics, including economics, public health and policy.	Subscription	EBSCO Publishing[6]
AGRICOLA:	Agriculture		Free & Subscription	Produced by the United

Name	Discipline(s)	Description	Access Cost	Provider(s)
Agricultural Online Access				States National Agricultural Library. Free access provided by NAL.[7] Subscription access provided by Proquest,[8] OVID.[9]
AGRIS: Agricultural database	Agriculture	Covers agriculture, forestry, animal husbandry, aquatic sciences and fisheries, human nutrition, extension literature from over 100 participating countries. Material includes unique grey literature such as unpublished scientific and technical reports, theses, conference papers, government publications, and more.	Free	Produced by the Food and Agriculture Organization of the United Nations. http://agris.fao.org AGRIS
Airiti Inc	Multidisciplinary	China, Taiwan.	Subscription	Airiti Inc[10]
Analytical Abstracts	Chemistry		Subscription	Royal Society of Chemistry[11]

Name	Discipline(s)	Description	Access Cost	Provider(s)
Analytical sciences digital library	Analytical chemistry		Free	National Science Digital Library and the Analytical Chemistry Division of the American Chemical Society[12]
Anthropological Index Online	Anthropology	Index only (no abstracts or full-text).	Free	Royal Anthropological Institute[13]
Anthropological Literature	Anthropology		Free to Harvard faculty, staff and students. Subscription for non-Harvard access.	Maintained by Harvard University. Non-Harvard access provided by OCLC[14]
Arachne	Archaeology, Art history	German language	Free	German Archaeological Institute & the University of Cologne[15]
Arnetminer	Computer Science	Online service used to index and search	Free	Tsinghua University[16]

Name	Discipline(s)	Description	Access Cost	Provider(s)
		academic social networks		
Arts & Humanities Citation Index	Arts, Humanities	Part of Web of Science	Subscription	Thomson Reuters[17]
arXiv	Physics, Mathematics, Computer science, Nonlinear sciences, Quantitative biology and Statistics		Free	Cornell University[18]
Association for Computing Machinery Digital Library	Computer Science, Engineering		Subscription	Association for Computing Machinery[19]
Astrophysics Data System	Astrophysics, Geophysics, Physics		Free	Harvard University[20]

Name	Discipline(s)	Description	Access Cost	Provider(s)
ATLA Religion Database	Religious studies	Provides information on topics such as biblical studies, world religions, church history, and religion in social issues	Subscription	[21]
AULIMP: Air University Library's Index to Military Periodicals	Military Science		Free	Air University[22]
BASE: Bielefeld Academic Search Engine	Multidisciplinary		Free	Bielefeld University[23]
Beilstein database	Organic chemistry		Subscription	Available from Elsevier under the product name Reaxys[24]
Biological Abstracts	Biology	A complete collection of bibliographic references covering life science and biomedical research literature published from more than 4,000 journals internationally.	Subscription	Available from Thomson Reuters[25]

Name	Discipline(s)	Description	Access Cost	Provider(s)
BioOne	Biology, Ecology, and Environmental Science	An aggregation of over 78,000 peer-reviewed, full-text articles on current research in Biodiversity Conservation, Biology, Ecology, Plant Sciences, Entomology, Ornithology, and Zoology.	Free Abstract & References, Subscription Collections, and an Open Access Collection	Available from BioOne[26]
Bioinformatic Harvester	Biology, Bioinformatics	A meta search engine for 50 major bioinformatic databases and projects.	Free	Available from Liebel-Lab [3] KIT Karlsruhe Institute of Technology [4]
Book Review Index Online	Book reviews		Subscription	Thomson Gale[27]
Books In Print	Books		Subscription	R.R. Bowker[28]
CAB Abstracts	Applied Life Sciences	Bibliographic information service providing access to applied life sciences literature.	Subscription	CABI[29]
Chemical Abstracts Service	Chemistry		Subscription	American Chemical Society[30]
ChemXSeer	Chemistry		Free	Pennsylvania State

Name	Discipline(s)	Description	Access Cost	Provider(s)
				University[31]
Chinese Social Science Citation Index	Social sciences		Subscription	Nanjing University[32]
Cochrane Library	Medicine, Healthcare	Includes reviews of research to promote evidence-based healthcare.	Subscription	Wiley Interscience[33]
CINAHL: Cumulative Index to Nursing and Allied Health	Nursing, Allied Health		Subscription	EBSCO[34]
CHBD: Circumpolar Health Bibliographic Database	Medicine		Free	University of Calgary[35]
Citebase Search	Mathematics, Computer science, Physics	Semi-autonomous citation index of free online research	Free	University of Southampton[36]
CiteULike	Computer science		Free	
CiteSeer	Computer Science	Replaced by CiteSeerX.	Free	Pennsylvania State

Name	Discipline(s)	Description	Access Cost	Provider(s)
				University[37]
CiteSeerX	Computer science, Statistics, Mathematics, becoming Multidisciplinary		Free	Pennsylvania State University[38]
CogPrints: Cognitive Sciences Eprint Archives	Science (General)		Free	University of Southampton[39]
The Collection of Computer Science Bibliographies	Computer science		Free	Alf-Christian Achilles[40]
Compendex	Engineering	Electronic version of *Engineering Index*.	Subscription	Elsevier[41]
Current Index to Statistics	Statistics	Limited free search[42]	Subscription	American Statistical Association and the Institute of Mathematical Statistics[43]

Name	Discipline(s)	Description	Access Cost	Provider(s)
Current Contents	Multidisciplinary	Part of Web of Knowledge. Contains 7 discipline-specific subsets.	Subscription	Thomson Reuters[44]
Directory of Open Access Journals	Journals		Free	Lund University[45]
DBLP	Computer science	Comprehensive list of papers from major computer science conferences and journals	Free	University of Trier, Germany
EconBiz	Economics	EconBiz supports research in and teaching of economics with a central entry point for all kinds of subject-specific information and direct access to full texts.	Free	Produced by the ZBW-German National Library of Economics–Leibniz Information Centre for Economics (ZBW) [46]
EconLit	Economics	The American Economic Association's electronic database, the world's foremost source of references to economic literature.	Subscription	Produced by the American Economic Association.[47] Available from CSA, DIALOG, OCLC, OVID, and AEA.[48]

Name	Discipline(s)	Description	Access Cost	Provider(s)
EMBASE	Biomedicine, Pharmacology	Biomedical database with a strong focus on drug and pharmaceutical research.	Subscription	Elsevier[49]
ERIC: Educational Resource Information Center	Education	Education literature and resources. Provides access to over 1.3 million records dating back to 1966.	Free	Produced by the United States Department of Education.[50] Also available by subscription from OCLC, CSA.
Food Science and Technology Abstracts	Food science, Food technology, Nutrition	The world's leading database of information on food science, food technology and nutrition	Subscription	Produced by the International Food Information Service. Access provided by OVID, Web of Knowledge, Dialog, DataStar and STN International[51]
GENESIS	Women's history	Descriptions of women's history collections from sources in the UK, as well as women's	Free	London Metropolitan University[52]

Name	Discipline(s)	Description	Access Cost	Provider(s)
		history websites.		
Global Health	Public Health	Specialist bibliographic, abstracting and indexing datatabase dedicated to public health research and practice.	Subscription	CABI[53]
Google Scholar	Multidisciplinary		Free	Google[54]
GoPubMed	Medicine	GoPubMed, the first knowledge-based search engine for the life sciences industry.	Free	Transinsight[55]
HubMed	Medicine	An alternative interface to the PubMed medical literature database	Free	Alf Eaton[56]
IEEE Xplore	Computer Science, Engineering, Electronics		Subscription	IEEE[57]
Index Copernicus	Multidisciplinary science	Scientific journal database – the IC Journal Master List – contains currently over 2,500 journals from all over the world, including 700 journals from Poland. The journals registered in this database underwent rigorous, multidimensional parameterization,	Free	Index Copernicus International[59]

Name	Discipline(s)	Description	Access Cost	Provider(s)
		proving high quality. The Ministry of Science and Higher Education acknowledged the IC Journal Master List by placing it on the list of scored databases, for being indexed in IC JML journals get additional points in the Ministry's evaluation process.[58]		
Information Bridge: Department of Energy Scientific and Technical Information	Multidisciplinary	The Information Bridge: DOE Scientific and Technical Information provides free public access to over 266,000 full-text documents and bibliographic citations of Department of Energy (DOE) research report literature. Documents are primarily from 1991 forward and were produced by DOE, the DOE contractor community, and/or DOE grantees. Legacy documents are added as they become available in electronic format.	Free	United States Department of Energy, Office of Scientific and Technical Information[60]
Informit	Multidisciplinary	Australasian aggregator of bibliographic databases and journals	N/A	RMIT Publishing[61]

Name	Discipline(s)	Description	Access Cost	Provider(s)
IngentaConnect	Multidisciplinary		Free searching; Subscription full-text	Ingenta[62]
Indian Citation Index	Multidisciplinary	Indian Citation Index (ICI) is a home grown abstracts and citation database, with multidisciplinary objective knowledge contents from about 1000 top Indian scholarly journals. It provides powerful search engine to fulfill search and evaluation purposes for researchers, policy makers, decision makers etc.	Subscription	ICI[63]
Inspec	Physics, Engineering, Computer Science	The leading bibliographic database providing abstracts and indexing to the world's scientific and technical papers in physics, electrical engineering, electronics, communications, control engineering, computing, information technology, manufacturing, production, and mechanical engineering.	Subscription	IET[64]
International	Philosophy	Contains information on university	Free search; full	Philosophy

Name	Discipline(s)	Description	Access Cost	Provider(s)
Directory of Philosophy		philosophy departments and programs, philosophical societies, research centers, journals, and philosophy publishers in the U.S., Canada, and approximately 130 other countries.	access by subscription	Documentation Center[65]
Intute	Multidisciplinary	Serves students, teachers, and researchers in UK further education and higher education, offering a selection of around 300,000 academic websites which have been hand-picked and described by subject specialists. No longer maintained.	Free	Intute[66]
JournalSeek	Multidisciplinary	Open access journals in different language	Links to journal's home page and publishers	JournalSeek[67]
JSTOR: Journal Storage	Multidisciplinary (Historical)		Subscription	JSTOR[68]
JournalSeek	Multidisciplinary	Open access journals in different language	Links to journal's home page and	JournalSeek[67]

Name	Discipline(s)	Description	Access Cost	Provider(s)
			publishers	
Jurn	Multidisciplinary	Open access journals, primarily in the arts and humanities, but also coverage in science, biomedical, and economics.	Free	Jurn[69]
Lesson Planet	Education (K-12)	Over 400,000 teacher-reviewed classroom resources including lesson plans, worksheets, educational videos, and education articles.	Free Abstract; Subscription full-text	Lesson Planet[70]
LexisNexis	Law (general)	Electronic database for legal and public-records related information	Subscription	Reed Elsevier[71]
MathSciNet	Mathematics	Available in print as Mathematical Reviews	Subscription	American Mathematical Society[72]
MedlinePlus	Medicine		Free	Produced by the United States National Library of Medicine, the United States National Institutes of Health, and the United States

Name	Discipline(s)	Description	Access Cost	Provider(s)
				Department of Health and Human Services[73]
Mendeley	Multidisciplinary	The Mendeley research catalog is a crowdsourced database of research documents. Researchers have uploaded nearly 100M documents into the catalog with additional contributions coming directly from subject repositories like Pubmed Central and Arxiv.org or web crawls.	Free	Mendeley[74]
Merck Index	Chemistry, Biology, Pharmacology	Also available in print.	Subscription	Produced by Merck & Co.. Available from CambridgeSoft Corporation, Dialog, Knovel, MedicinesComplete, STN International[75]
Meteorological and Geoastrophysical	Meteorology, Astrophysics,		Subscription	Produced by the American

Name	Discipline(s)	Description	Access Cost	Provider(s)
Abstracts	Geology			Meteorological Society. Available from Dialog[76] and CSA.[77]
Microsoft Academic Search	Computer Science and a limited extent on information science	Provides many innovative ways to explore scientific papers, conferences, journals, and authors[78]	Free	Microsoft
NBER: National Bureau of Economic Research	Economics		Free	National Bureau of Economic Research[79]
National Criminal Justice Reference Service[80]	Criminology, Sociology	Abstracts of scholarly journal articles, agency and NGO reports, and conference proceedings	Free	United States Department of Justice, Office of Justice Programs[81]
National Diet Library Collection	Multidisciplinary	Japanese. Catalog for the National Library of Japan.	N/A	National Diet Library[82]
OAIster	Multidisciplinary		Free	OCLC[83]

Name	Discipline(s)	Description	Access Cost	Provider(s)
OpenSIGLE	Grey literature	Indexes European grey literature.	Free	Institut de l'information scientifique et technique[84]
Philosophy Documentation Center eCollection	Applied ethics, Philosophy, Religious studies	Journals, series, conference proceedings, and other works from several countries online.	Free abstract & preview; Subscription full-text	Philosophy Documentation Center[85]
Philosophy Research Index	Philosophy	Index of books, journals, disserations, and other documents	Subscription	Philosophy Documentation Center[85]
PhilPapers	Philosophy		Free	PhilPapers[86]
POIESIS: Philosophy Online Serials	Philosophy, applied ethics, religious studies	Journals and series, online access for institutions with print	Free abstract & preview; Subscription full-text	Philosophy Documentation Center[85]
POPLINE	Population, Family Planning, Reproductive Health	POPLINE® contains the world's most comprehensive collection of population, family planning and related reproductive health and development literature. An international resource, POPLINE helps	Free	Knowledge for Health, Center for Communication Programs, Johns Hopkins Bloomberg

Name	Discipline(s)	Description	Access Cost	Provider(s)
		program managers, policy makers, and service providers in low- and middle-income countries and in development-supportive agencies and organizations gain access to journal articles and other scientific, technical, and programmatic publications.		School of Public Health[87]
PsycINFO	Psychology	The largest resource devoted to peer-reviewed literature in behavioral science and mental health. It contains over 2.6 million citations and summaries dating as far back as the early 19th century.	Subscription	Produced by the APA.[88] Available from several database vendors.[89]
Pubget	Multidisciplinary		Subscription	Pubget
PubMed	Biomedical		Free	National Institutes of Health and the U.S. National Library of Medicine[90]
PubChem	Chemistry		Free	National Center for Biotechnology

Name	Discipline(s)	Description	Access Cost	Provider(s)
				Information and the U.S. National Library of Medicine[91]
Questia: Online Research Library	Multidisciplinary (Historical)		Subscription	Questia[92]
Readers' Guide to Periodical Literature	Journals and Magazines	Coverage: 1983–present.	Subscription	H. W. Wilson Company[93]
Reader's Guide Retrospective: 1890–1982	Journals and Magazines		Subscription	H. W. Wilson Company[94]
RePEc: Research Papers in Economics	Economics		Free	Volunteer Collaboration[95]
Rock's Backpages	Music	Primary documents from the history of rock and roll	Subscription. Limited free access with registration.	Backpages Limited[96]
Russian Science Citation Index	Scientific journals	A bibliographic database of scientific publications in Russian.	Free	Scientific Electronic Library[97]
SafetyLit	Multidisciplinary	Citations and abstracts of journal articles and	Free	Graduate School of

Name	Discipline(s)	Description	Access Cost	Provider(s)
		reports from researchers working in the more than 35 distinct professional disciplines (architecture - zoology) relevant to preventing unintentional injuries, violence, and self-harm.		Public Health, San Diego State University[98] and the World Health Organization's Department of Violence and Injury Prevention[99]
SciDiver.com	Multidisciplinary	SciDiver is an academic paper search engine for the physical sciences. The service currently maintains an index over arXiv, the preprint service for mathematics, physics, astronomy, computer science, quantitative finance and related disciplines; expansion to additional repositories is expected in the course of the site's continued development.	Free	SciDiver.com[100]
SciELO	Journals	SciELO is a bibliographic database and a	Free	FAPESP, CNPq and

Name	Discipline(s)	Description	Access Cost	Provider(s)
		model for cooperative electronic publishing in developing countries originally from Brazil. It contains 985 scientific journals from different countries in free and universal access, full-text format.		BIREME
Science.gov	Multidisciplinary	A gateway to government science information and research results. Science.gov provides a search of over 45 scientific databases and 200 million pages of science information with just one query, and is a gateway to over 2000 scientific Websites.	Free	Science.gov Alliance, 18 scientific and technical organizations from 14 federal agencies that contribute to Science.gov. United States Department of Energy, Office of Scientific and Technical Information serves as the operating agent for Science.gov.[101]

Name	Discipline(s)	Description	Access Cost	Provider(s)
Science Accelerator	Multidisciplinary	A gateway to results of DOE research and development and major R&D accomplishments of interest to DOE.	Free	United States Department of Energy, Office of Scientific and Technical Information.[102]
Science Citation Index	Science (General)	Part of Web of Science	Subscription	Thomson Reuters[103]
ScienceDirect	Multidisciplinary		Subscription	Elsevier[104]
Scirus	Science (General)		Free	Elsevier[105]
Scopus	Multidisciplinary		Subscription	Elsevier[106]
SearchTeam	Multidisciplinary	Students search together collaboratively for scholarly articles and resources	Free	Zakta[107]
Social Science Citation Index	Social science	Part of Web of Science	Subscription	Thomson Reuters[108]
Socol@r: Socolar	Multidisciplinary	Scholarly open access resources in different language	Free abstracts; Links to full-text	Socolar[109]
SSRN: Social Science Research	Social science	Contains an abstracts database and an electronic paper collection, arranged by	Free	Social Science Electronic Publishing,

Name	Discipline(s)	Description	Access Cost	Provider(s)
Network		discipline.		Inc.[110]
SSRRN: Social Science Research Resources Network	Social science	Indexes datasets and statistical codes	Free	Social Science Research Resources Network =[111]
SPIRES-HEP	Physics, (High Energy)		Free	Stanford Linear Accelerator Center & partners[112]
SpringerLink	Multidisciplinary		Free abstract & preview; Subscription full-text	Springer[113]
Ulrich's Periodicals Directory	Periodicals		Subscription	Proquest[114]
VET-Bib	Social Science, Education	European vocational education and training (VET) literature	Free	European Centre for the Development of Vocational Training[115]
Web of Knowledge	Multidisciplinary	Includes other products, such as Web of Science, Biological Abstracts & The Zoological Record	Subscription	Thomson Reuters[116]

Name	Discipline(s)	Description	Access Cost	Provider(s)
Web of Science	Science (General)	Includes other products, such as Social Science Citation Index & Science Citation Index.	Subscription	Thomson Reuters[117]
WestLaw	Law (General)		Subscription	Thomson Reuters
WFL Publisher	Food, Nutrition,Agriculture, Environment	English language	Free	WFL Publisher & the ISFAE Ry[118]
WorldCat	Multidisciplinary	Unified catalog of member libraries' catalogs	Free & Subscription	OCLC[119]
WorldWideScience	Multidisciplinary	WorldWideScience is a global science gateway composed of national and international scientific databases and portals. WorldWideScience accelerates scientific discovery and progress by providing one-stop searching of databases from around the world. Multilingual WorldWideScience provides real-time searching and translation of globally dispersed multilingual scientific literature.	Free	The WorldWideScience Alliance, a multilateral partnership, consists of participating member countries and provides the governance structure for WorldWideScience. United States

Name	Discipline(s)	Description	Access Cost	Provider(s)
				Department of Energy, Office of Scientific and Technical Information serves as the operating agent for WorldWideScience.[120]
Zasshi Kiji Sakuin: Japanese Periodicals Index	Journals	Japanese.	N/A	National Diet Library's Online Catalog,[121] MagazinePlus,[122] CiNii[123]
Zentralblatt MATH	Mathematics	First three records free without subscription.	Subscription	Springer Science+Business Media[124]
The Zoological Record	Zoology	Unofficial register of scientific names & papers in Zoology. Coverage 1864–present.	Subscription	Thomson Reuters[125]

APPENDIX-5

100 SEARCH ENGINES FOR ACADEMIC RESEARCH

Source: http://www.teachthought.com/technology/100-search-engines-for-academic-research/

General

Need to get started with a more broad search? These academic search engines are great resources.

No.	List of search engine		
1	**iSEEK Education**	:	iSeek is an excellent targeted search engine, designed especially for students, teachers, administrators, and caregivers. Find authoritative, intelligent, and time-saving resources in a safe, editor-reviewed environment with iSEEK.
2	**RefSeek**	:	With more than 1 billion documents, web pages, books, journals, newspapers, and more, RefSeek offers authoritative resources in just about any subject, without all of the mess of sponsored links and commercial results.
3	**Virtual LRC**	:	The Virtual Learning Resources Center has created a custom Google search, featuring only the best of academic information websites. This search is curated by teachers and library professionals around the world to share great resources for academic projects.
4	**Academic Index**	:	This scholarly search engine and web directory was created just for college students. The websites in this index are selected by librarians, teachers, and educational consortia. Be sure to check out their research guides for history, health, criminal justice, and more.
5	**BUBL LINK**	:	If you love the Dewey Decimal system, this

No.	List of search engine		
			Internet resource catalog is a great resource. Search using your own keywords, or browse subject areas with Dewey subject menus.
6	**Digital Library of the Commons Repository**	:	Check out the DLC to find international literature including free and open access full-text articles, papers, and dissertations.
7	**OAIster**	:	Search the OAIster database to find millions of digital resources from thousands of contributors, especially open access resources.
8	**Internet Public Library**	:	Find resources by subject through the Internet Public Library's database.
9	**Infomine**	:	The Infomine is an incredible tool for finding scholarly Internet resource collections, especially in the sciences.
10	**Microsoft Academic Search**	:	Microsoft's academic search engine offers access to more than 38 million different publications, with features including maps, graphing, trends, and paths that show how authors are connected.
11	**Google Correlate**	:	Google's super cool search tool will allow you to find searches that correlate with real-world data.
12	**Wolfram|Alpha**	:	Using expert-level knowledge, this search engine doesn't just find links; it answers questions, does analysis, and generates reports.

Meta Search

Want the best of everything? Use these meta search engines that return results from multiple sites all at once.

No.	List of search engine		
13	**Dogpile**	:	Find the best of all the major search engines with Dogpile, an engine that returns results from Google, Yahoo!, and Bing, with categories including Web, Images, Video, and even White

No.	List of search engine		
			Pages.
14	**MetaCrawler**	:	MetaCrawler makes it easy to "search the search engines," returning results from Google, Yahoo!, and Bing.
15	**Mamma**	:	Check out the mother of all search engines to pin down the best resources on the web. Mamma even searches Twitter and job postings!

Databases and Archives

Resources like the Library of Congress have considerable archives and documents available, and many of them have taken their collections online. Use these search tools to get access to these incredible resources.

No.	List of search engine		
16	**Library of Congress**	:	In this incredible library, you'll get access to searchable source documents, historical photos, and amazing digital collections.
17	**Archives Hub**	:	Find the best of what Britain has to offer in the Archives Hub. You'll be able to search archives from almost 200 institutions from England, Scotland, and Wales.
18	**National Archives**	:	Check out this resource for access to the National Archives. Find online, public access to find historic documents, research, government information, and more in a single search.
19	**arXiv e-Print Archive**	:	Cornell University's arXiv.org offers open access to a wealth of e-prints in math, science, and related subjects. Search this resource to find what you need among 756,133 documents and counting.
20	**Archivenet**	:	An initiative of the Historical Centre Overijssel, Archivenet makes it easy to find Dutch archives and more.

No.	List of search engine		
21	**NASA Historical Archive**	:	Explore the history of space in this historical archive from NASA, highlighting space history and manned missions.
22	**National Agricultural Library**	:	A service of the U.S. Department of Agriculture, you can find global information for agriculture in the National Agricultural Library.
23	**Smithsonian Institution Research Information System**	:	Get access to the considerable resources of the Smithsonian Institution through the Research Information System, a great way to search more than 7.4 million records from the Smithsonian's museums, archives, and libraries.
24	**The British Library Catalogues & Collections**	:	Explore the British Library catalogues, printed materials, digital collections, and even collection blogs for a wealth of resources.
25	**CIA World Factbook**	:	As the center of intelligence, the CIA has certainly done its job with The World Factbook, offering information on major reference information around the world. History, people, government, economy, and more are all covered in this online publication.
26	**State Legislative Websites Directory**	:	Use this database to find information from the legislatures of all 50 U.S. states, DC, and the Territories. You can look up bills, statutes, legislators, and more with this excellent tool.
27	**OpenDOAR**	:	In the Directory of Open Access Repositories, you can search through freely academic research information with more directly useful resources.
28	**Catalog of U.S. Government Publications**	:	Search through the Catalog of U.S. Government Publications to find descriptive records for historical and current publications, with direct links where available.

Books & Journals

Instead of heading to the library to bury your face in the stacks, use these search engines to find out which libraries have the books you need, and maybe even find them available online.

No.	List of search engine		
29	**WorldCat**	:	Find items from 10,000 libraries worldwide, with books, DVDs, CDs, and articles up for grabs. You can even find your closest library with WorldCat's tools.
30	**Google Books**	:	Supercharge your research by searching this index of the world's books. You'll find millions for free and others you can preview to find out if they're what you're looking for.
31	**Scirus**	:	For scientific information only, Scirus is a comprehensive research tool with more than 460 million scientific items including journal content, courseware, patents, educational websites, and more.
32	**HighBeam Research**	:	Research articles and published sources with HighBeam Research's tools. You'll not only be able to search for what you're looking for, you can also choose from featured research topics and articles. Note: HighBeam is a paid service.
33	**Vadlo**	:	Vadlo is a life sciences search engine offering protocols, tools, and powerpoints for scientific research and discovery. Find what you're looking for, and then stick around to check out the forums.
34	**Open Library**	:	Find the world's classic literature, open e-books, and other excellent open and free resources in the Open Library. You can even contribute to the library with information, corrections to the catalog, and curated lists.

No.	List of search engine		
35	**Online Journals Search Engine**	:	In this free, powerful scientific search engine, you can discover journals, articles, research reports, and books in scientific publications.
36	**Google Scholar**	:	Check out Google Scholar to find only scholarly resources on Google. The search specializes in articles, patents, and legal documents, and even has a resource for gathering your citations.
37	**Bioline International**	:	Search Bioline International to get connected with a variety of scientific journals. The search is managed by scientists and librarians as a collaborative initiative between Bioline Toronto and and the Reference Center on Environmental Information.
38	**SpringerLink**	:	Search through SpringerLink for electronic journals, protocols, and books in just about every subject possible. You can also browse publications by collection and content type.
39	**Directory of Open Access Journals**	:	When you need top-quality journal writings for free, the Directory of Open Access Journals is a great place to check out. You'll get access to a searchable journal of full-text quality controlled scientific and scholarly journals.
40	**Jurn**	:	In this curated academic search engine, you'll get results from over 4,000 free scholarly e-journals in the arts and humanities.

Science

With a focus on science, these academic search engines return all-science, all the time.

No.	List of search engine		
41	**SciSeek**	:	In this science search engine and directory, you'll find the best of what the science web has to offer.

No.	List of search engine		
			Browse by category, search by keyword, and even add new sites to the listings.
42	**Chem BioFinder**	:	Register with PerkinElmer to check out the Chem BioFinder and look up information about chemicals, including their properties and reactions.
43	**Biology Browser**	:	Biology Browser is a great resource for finding research, resources, and information in the field of biology. You can also check out their Zoological Record and BIOSIS Previews.
44	**Athenus**	:	Athenus is an authority on science and engineering on the Web, sharing a directory and full-featured web search.
45	**SciCentral**	:	Use SciCentral as your gateway to the best sources in science. This site has a literature search, journals, databases, and other great tools for finding what you need.
46	**Strategian**	:	Strategian is a great place to find quality information in all fields of science. Featured resources include free full-text books, patents, and reports, as well as full-text journal and magazine articles, plus a special collection of Vintage Biology with important articles and books in biology.
47	**Science.gov**	:	In this government science portal, you can search more than 50 databases and 2,100 selected websites from 12 federal agencies. This is an incredible resource for millions of pages of U.S. government science information.
48	**CERN Document Server**	:	This organization for nuclear research serves up a great search and directory for experiments, archives, articles, books, presentations, and so

No.	List of search engine		
			much more within their documents.
49	**Analytical Sciences Digital Library**	:	Through the Analytical Sciences Digital Library, you'll find peer-reviewed, web-based educational resources in analytical sciences, featuring a variety of formats for techniques and applications.
50	**WorldWideScience**	:	Use WorldWideScience.org as a global science gateway, offering excellent search results in the sciences, and even the option to select specific databases and find resources in your own language.

Math & Technology

Keep your results limited to only the best math and technology resources by using these search engines.

No.	List of search engine		
51	**MathGuide**	:	Check out the MathGuide subject gateway to find online information sources in mathematics. The catalog offers not just a search, but a database of high quality Internet resources in math.
52	**ZMATH Online Database**	:	Zentralblatt MATH's online database has millions of entries from thousands of serials and journals dating back as far as 1826. Nearly 35,000 items were added in 2012 alone.
53	**Math WebSearch**	:	This semantic search engine allows users to search with numbers and formulas instead of text.
54	**Current Index to Statistics**	:	In this bibliographic index, you'll find publications in statistics, probability, and related fields. There are more than 160 preferred journals, plus selected articles from 1,200 more and 11,000 statistics books to draw from in this search.

No.	List of search engine		
55	**Inspec**	:	This database was made for scientists and engineers by the Institution of Engineering and Technology. You'll find nearly 13 million abstracts and research literature, primarily in the fields of physics and engineering.
56	**CiteSeerX**	:	Get searchable access to the Scientific Research Digital Library by using the CiteSeerX website.
57	**The Collection of Computer Science Bibliographies**	:	Find more than 3 million references to journal articles, conference papers, and technical reports in computer science with this bibliography collection.
58	**Citebase**	:	Still in experimental demonstration, Citebase Search is a resource for searching abstracts in math, technology, and more.

Social Science

Researchers working in the fields of psychology, anthropology, and related subjects will find great results using these search engines.

No.	List of search engine		
59	**Behavioral Brain Science Archive**	:	Check out this searchable archive to find extensive psychology and brain science articles.
60	**Social Science Research Network**	:	In this research network, you can find a wide variety of social science research from a number of specialized networks including cognitive science, leadership, management, and social insurance.
61	**Psycline**	:	Find a journal with Psycline's journal and article locator, a tool that offers access to more than 2,000 psychology and social science journals online.
62	**Social Sciences Citation Index**	:	The Thomson Reuters Social Sciences Citation Index is a paid tool, but well worth its cost for the

No.	List of search engine		
			wealth of relevant articles, search tools, and thorough resources available.
63	**Ethnologue**	:	Search the languages of the world with Ethnologue, offering an encyclopedic reference of all the world's known living languages. You'll also be able to find more than 28,000 citations in the Ethnologue's language research bibliography.
64	**SocioSite**	:	Use this site from the University of Amsterdam to browse sociological subjects including activism, culture, peace, and racism.
65	**The SocioWeb**	:	Check out this guide to find all of the sociological resources you'll need on the internet. The SocioWeb offers links to articles, essays, journals, blogs, and even a marketplace.
66	**WikiArt**	:	With this custom Google search engine, you can find open access articles about archaeology.
67	**Encyclopedia of Psychology**	:	Search or browse the Encyclopedia of Psychology to find basic information, and even translations for information about psychology careers, organizations, publications, people, and history.
68	**Anthropology Review Database**	:	Through this database, you can get access to anthropology reviews, look up publishers, and find resources available for review.
69	**Anthropological Index Online**	:	This anthropological online search includes both general search of 4,000 periodicals held in The British Museum Anthropology Library as well as Royal Anthropological Institute films.
70	**Political Information**	:	Political Information is a search engine for politics, policy, and political news with more than 5,000 carefully selected websites for political information.

History

Find awesome resources for history through these search engines that index original documents, sources, and archives.

No.	List of search engine		
71	**David Rumsey Historical Map Collection**	:	Use the LUNA Browser to check out David Rumsey's Map Collection with more than 30,000 images, searchable by keyword.
72	**Genesis**	:	Find excellent sources for women's history with the Genesis dataset and extensive list of web resources.
73	**Fold3**	:	Get access to historical military records through Fold3, the web's premier collection of original military records and memorials.
74	**Internet Modern History Sourcebook**	:	Use the Internet Modern History Sourcebook to find thousands of sources in modern history. Browse and search to find full texts, multimedia, and more.
75	**Library of Anglo-American Culture and History**	:	Use the history guide from the Library of Anglo-American Culture and History for a subject catalog of recommended websites for historians, with about 11,000 to choose from.
76	**HistoryBuff**	:	History Buff offers an online newspaper archive, reference library, and even a historical panoramas section in their free primary source material collection.
77	**Digital History**	:	University of Houston's Digital History database offers a wealth of links to textbook, primary sources, and educational materials in digital history. The database has multimedia, an interactive timeline, active learning, and resources for teachers.
78	**Internet Ancient History**	:	The Internet Ancient History Sourcebook is a great place to study human origins, with full text

No.	List of search engine		
	Sourcebook		and search on topics including Mesopotamia, Rome, the Hellenistic world, Late Antiquity, and Christian origins.
79	**History and Politics Out Loud**	:	History and Politics Out Loud offers a searchable archive of important recordings through history, particularly politically significant audio materials.
80	**History Engine**	:	In this tool for collaborative education and research, students can learn history by researching, writing, and publishing, creating a collection of historical articles in U.S. history that can be searched for here by scholars, teachers, and the general public.
81	**American History Online**	:	Through American History Online, you can find and use primary sources from historical digital collections.

Business and Economics

Using these search engines, you'll get access to business publications, journal articles, and more.

No.	List of search engine		
82	**BPubs**	:	Search the Business Publications Search Engine for access to business and trade publications in a tool that offers not just excellent browsing, but a focused search as well.
83	**Virtual Library Labour History**	:	Maintained by the International Institute of Social History, Amsterdam, this library offers historians excellent content for learning about economics, business, and more.
84	**EconLit**	:	Visit EconLit to access more than 120 years of economics literature from around the world in an easily searchable format. Find journal articles, books, book reviews, articles, working papers,

No.	List of search engine		
			and dissertations, as well as historic journal articles from 1886 to 1968.
85	**National Bureau of Economic Research**	:	On this site, you can learn about and find access to great resources in economic research.
86	**Research Papers in Economics**	:	Find research in economics and related sciences through the RePEc, a volunteer-maintained bibliographic database of working papers, articles, books, and even software components with more than 1.2 million research pieces.
87	**Corporate Information**	:	Perfect for researching companies, Corporate Information offers an easy way to find corporate financial records.
88	**Inomics**	:	Economists will enjoy this excellent site for finding economics resources, including jobs, courses, and even conferences.
89	**DailyStocks**	:	Easily look up stocks with this search engine to monitor the stock market and your portfolio.
90	**EDGAR Search**	:	The SEC requires certain disclosures that can be helpful to investors, and you can find them all here in this helpful, next-generation system for searching electronic investment documents.

Other Niches

Find even more specialized information in these niche search engines.

No.	List of search engine		
91	**PubMed**	:	From the U.S. National Library of Medicine, PubMed is a great place to find full-text medical journal articles, with more than 19 million available.
92	**Lexis**	:	Find reliable, authoritative information for legal search with the Lexis site.

No.	List of search engine		
93	**Circumpolar Health Bibliographic Database**	:	Visit this database to find more than 6,300 records relating to human health in the circumpolar region.
94	**Education Resources Information Center**	:	In the ERIC Collection, you'll find bibliographic records of education literature, as well as a growing collection of full-text resources.
95	**MedlinePlus**	:	A service of the U.S. National Library of Medicine, Medline Plus offers a powerful search tool and even a dictionary for finding trusted, carefully chosen health information.
96	**Artcyclopedia**	:	Search Artcyclopedia to find everything there is to know about fine art, with 160,000 links, 9,000 artists listed, and 2,900 art sites indexed.

Reference

Get connected with great reference material through these search tools.

No.	List of search engine		
97	**Merriam-Webster Dictionary and Thesaurus**	:	Use this online dictionary and thesaurus to quickly find definitions and synonyms.
98	**References.net**	:	Through References.net, you can get connected with just about every reference tool available, from patents to almanacs.
99	**Quotes.net**	:	Need the right thing to say? Check out Quotes.net to reference famous words from famous people.
100	**Literary Encyclopedia**	:	Check out the Literary Encyclopedia to get access to reference materials in literature, history, and culture.

APPENDIX-6

15 EDUCATIONAL SEARCH ENGINES FOR RESEARCH

by Allie Gray Freeland 2009.

Source:

http://www.rasmussen.edu/student-life/blogs/college-life/15-educational-search-engines/

No.	List of search engine		
1	**iSEEK**	**:**	A 2009 Codi Award Finalist, iSeek is a great search engine for students, teachers and administrators. Simply ask a question or enter search topics or tools and iSEEK will pull from scholastic sources to find exactly what you are looking for. The search engine is safe, intelligent and time–saving—and it draws from trusted resources from universities, government and established non–commercial sites.
2	**Google Book Search**	**:**	In this day and age everything is online—even books. Google Book Search allows web users to peruse though an index of thousands of books, from popular titles to old, to find pages that include your search terms. Once you find the book you are looking for, you can browse through pages, find online reviews and learn where you can get a hard copy. From bibliographies to lesson plans, the pool of thousands of books can help students and teachers reach their educational goals.
3	**Google Custom Search Engine**	**:**	It's no secret that Google is always one step ahead—and this holds true for their custom search engine tool. Google Custom Search Engine is a research tool where users can create a customized search to probe across specified sites. All you need to do is select the websites and pages you'd like to search from—then Google will do the dirty work. The ability to narrow down the pool of sources can really

No.	List of search engine		
			help students and teachers work efficiently on the web.
4	**Google Scholar**	**:**	Last Google application, I swear! Google Scholar was created as a tool to congregate scholarly literature on the web. From one place, students have the ability to hunt for peer–reviewed papers, theses, books, abstracts and articles from academic publishers, professional societies, preprint repositories, universities and other scholarly organizations.
5	**Educational Resources Information Center**	**:**	Populated by the U.S. Department of Education, the Educational Resources Information Center (ERIC) is a great tool for academic research with more than 1.3 million bibliographic records of articles and online materials. ERIC provides access to an extensive body of education–related literature including journal articles, books, research syntheses, conference papers, technical reports, policy papers and more. With more than eight million searches each month —it's no wonder why this search engine is a great web source for education.
6	**Federal Resources for Academic Excellence**	**:**	Created in the late 90s by the U.S. Federal Government, the Federal Resources for Academic Excellence (FREE) makes it easier to find teaching and learning resources. More than 1,500 federally supported resources are hosted on this search engine on topics including: arts & music, health & physical education, language arts, math and U.S. History.
7	**Scirus**	**:**	Scirus is a leading search engine for science students on the web. This search engine has a comprehensive database of more than 350 million scientific–related pages including: academic journals, websites, scientists' homepages, pre–print server material, patents and institutional repository. Moreover, the site allows users to locate technical and medical data, find current reports,

No.	List of search engine		
			search through peer–reviewed articles and examine patents through a selective search engine.
8	**Intute**	**:**	With thousands of websites on the internet, it is often difficult to find the right sources when it comes to researching—but with Intute's help, your studies can be a little easier. Intute is a free search engine based in the UK that allows students to search an array of academic sources by subject. The search engine's subject specialists review and evaluate thousands of resources to help users choose the key websites in a range of academic topics. In addition to the comprehensive search engine, Intute has 60 free online tutorials written by college professors and librarians to develop your Internet research skills.
9	**Virtual Learning Resources Center**	**:**	Virtual Learning Resources Center (VLRC) is an online index that hosts thousands of scholarly websites, all of which are selected by teachers and librarians from around the globe. The site provides students and teachers with current, valid information for school and university academic projects using an index of more than 10,000 web pages gathered from research portals, universities and library Internet subject guides recommended by teachers and librarians. Areas represented in this search engine include : full–text magazines, newspapers, electronic text archives, art history, biography, biology, career information, psychology, history, government information, literature, medicine, social sciences, legislation, art, crime, history, economics, education, writing, foreign languages, geography, genealogy, government, literature, mathematics, music, science and technology.
10	**American Memory**	**:**	History majors: take not of this search engine. American Memory is a gateway to the Library of Congress's

No.	List of search engine		
			database of more than nine million digitized documents, sound recordings, images, maps, and other American primary sources. This free and open access site includes sound recordings, images, prints, maps and articles that document United States history and culture. This search engine is the go–to source for American history.
11	**Noodle Tools**	**:**	Noodle Tools is a service that helps students find references for papers or projects. Users can choose the best search for your information need based on an analysis of your topic or sift through the database of how–to articles. This site is widely used among college institutions, as it provides not only an all–inclusive search functionality, but also a citation generator for bibliographies in MLA, APA, or Chicago style.
12	**Clusty**	**:**	Clusty is the brainchild of three Carnegie Mellon University scientists who have tackled the problem of information overload in web searching. Rather than generating search results from all types of internet sources, Clusty clusters (hence its name) keyword searches to include the best results for academic discovery. Search clusters include: web, news, images, Wikipedia, blogs, shopping, government and labs. Simply type your search terms, then clustered search results will appear, citing specific scholarly sources and other search engine sites.
13	**WorldCat**	**:**	Instead of sifting through hundreds of books at the library, just pop in front of your laptop and navigate to WorldCat—a site where you search many libraries at once for an item and then locate it in a library nearby. Whether it's popular books, music CDs and videos—WorldCat will help you locate the materials for your next paper or project. You can also discover many new kinds of digital

No.	List of search engine		
			content, such as downloadable audiobooks. You may also find article citations with links to full text, authoritative research materials and digital versions of rare items that aren't available to the public.
14	**Librarians' Internet Index**	**:**	A librarian's forte is research—and this search engine has channeled their expertise to a site called Librarians Internet Index. The search engine is a well–annotated directory of web resources hand–picked by librarians. It has over 20,000 records representing high–quality websites from topics ranging from technology to social science.
15	**Infomine**	**:**	Infomine is a librarian–built virtual library of internet resources relevant to faculty, students and research staff at the collegiate level. This site narrows searches to a comprehensive academic virtual library filled with websites, databases, electronic journals, electronic books and directories of researchers. Librarians from the University of California, Wake Forest University, California State University, the University of Detroit – Mercy, and other universities and colleges have contributed to building Infomine.

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23) Google is currently the most used search engine. It has one of the largest databases of Web pages, including many other types of web documents like **blog** posts, **wiki** pages, **group** discussion threads and document formats, **PDFs**, Word or Excel documents, Power Points etc. Despite the presence of all these formats, Google's **popularity** ranking often places worthwhile pages near the top of search results.

24) Google alone is not always sufficient, not everything on the Web is fully searchable in Google. **Overlap studies** show that more than 80% of the pages in a major search engine's database exist only in that database. For this reason, getting a "second opinion" can be worth your time. For this purpose, **Yahoo! Search** or **Exalead** are useful. use of **meta-search engines** as primary search tool is generally not recommend.

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