
ACADEMIC SEARCH ENGINES: LIBRARIAN'S FRIEND, RESEARCHER'S DELIGHT

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Abstract

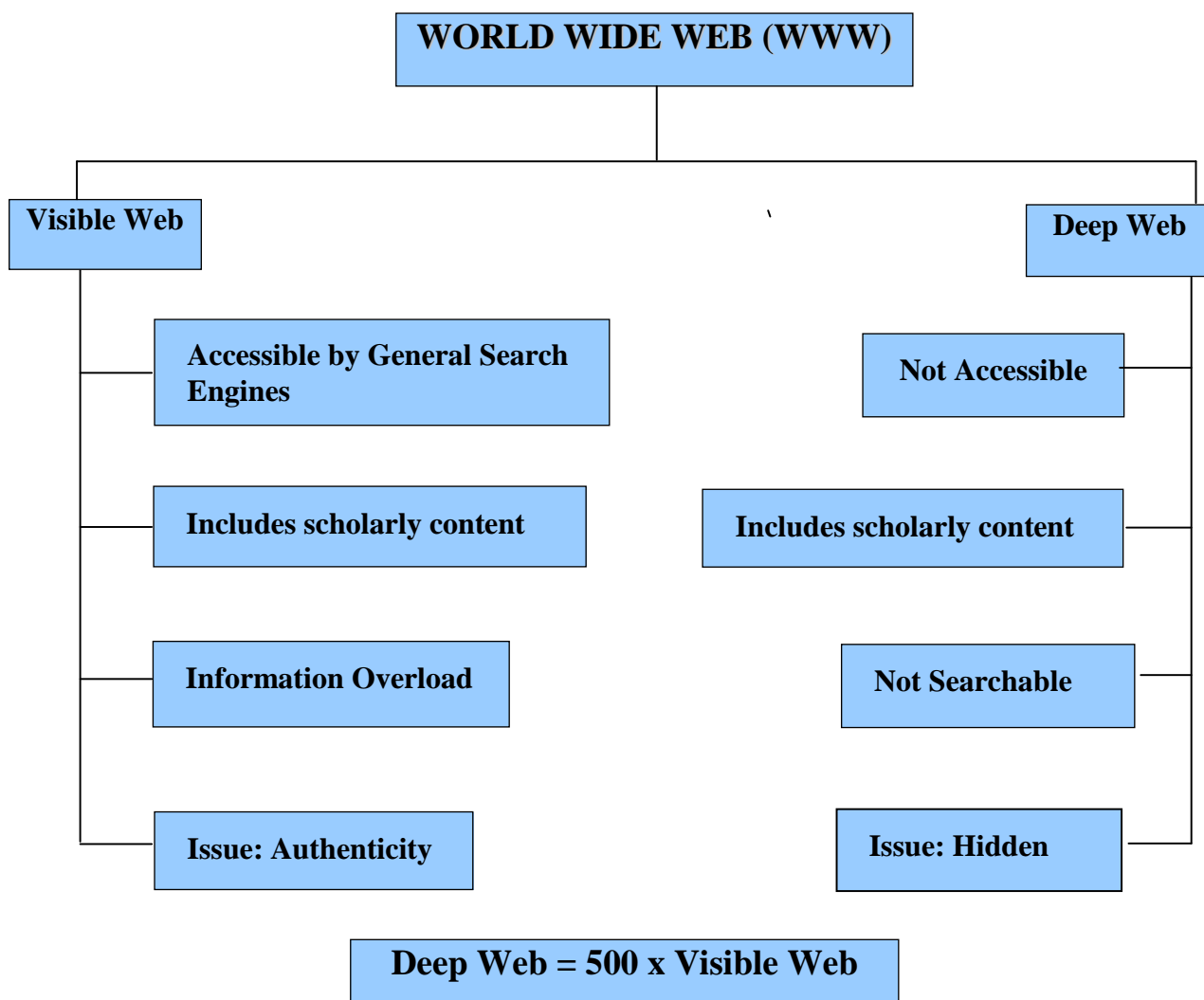
Search engines are about excitement, optimism, hope and enrichment. Search engines are also about despair and disappointment. A researcher while using search engines for resource discovery might have experienced one or the other sentiments. One may say that user satisfaction depends much upon the search strategies deployed by the user. But at the same time its also depends upon the quality of search engine used for information retrieval. Today, there are many search engines used for resource discovery. They display the results of the searches made in readily-comprehensible manner with lots of customization possibilities including refining and sorting. This paper is an attempt to analyze qualitatively and quantitatively the three most used and popular search engines for academic resource discovery: Google Scholar, Scirus and Windows Live Academic.

Keywords: Google Scholar; Scirus; Windows Live Academic; Invisible Web; Search Engine.

1. The Invisible Web

The web can be divided into two parts - the Visible web and the Invisible web. The "**Visible web**" or the "**Surface web**" is what we see in the result pages from general web search engines. It's also what we see in almost all subject directories. The "**Deep/Invisible web**" is what we cannot retrieve ("see") in the search results and other links contained in these types of tools. Deep Web refers to information served up on Web sites that is hidden or generally inaccessible through traditional search methods. For example, information that resides or is provided through searchable databases, the results of which can only be discovered through direct queries or by filling out Web based forms is considered Deep Web data.

The study, conducted by search company BrightPlanet, estimates that the inaccessible part of the web is about 500 times larger than what general search engines provide access to. To put in another way, Google currently claims to have indexed about 1 billion web pages, making it the largest crawler-based search engine, based on reported numbers. Using Google as a benchmark, that means BrightPlanet would estimate there are about 500 billion pages of information available on the web, and only 1/500 of that information can be reached via traditional search engines. More than an estimated 200,000 Deep Web sites exists presently. Sixty of the largest Deep Web sites collectively contain about 750 terabytes of information – sufficient by themselves to exceed the size of the surface Web by 40 times.



2. Information overload need of Academic Search Engines:

"Technology reduces the amount of time it takes to do any one task but also leads to the expansion of tasks that people are expected to do." --Juliet Schor

Information overload is the provision of information in excess of the cognitive and emotional ability of an individual to process that information. Search engines help researchers to find out academic documents of their research area through their searching capabilities, user friendliness, simplicity, search velocity and broad coverage. These attracting features must also be true while discovering the Academic Web. It is a fact that both visible and invisible web are relevant to libraries. Search engines should have the right balance and mix for both types of content. This can be achieved in a better way through a co-operative approach. Search should have the potential to make the invisible web visible to the researchers and that too without much complexity. The major

partners of such a cooperative effort are the commercial search engines, libraries and the database vendors. Their role and strength can be seen as under:

Commercial search engines	Technological and financial superiority, continuous development and innovation.
Libraries	Great knowledge assets and facilitators of knowledge. They have already developed complex instruments for information organization (e.g. thesauri, classification, taxonomies) which could be highly valuable for end-user searching, automatic indexing, ontology building and classification of academic content.
Publishers and database vendors	Huge database of academic content

3. Popular Academic Search Engines:

We will be evaluating and comparing the three basic and widely used search engines used for academic purposes. These are:

1. Google Scholar
2. Scirus
3. Windows Live Academic

To be fair enough we will also deal with the Google “Accessories” - Google Book Search, Google Blog, Google Groups as these are also being used widely by researchers for retrieving scholarly information on the web.

3.1 Google Scholar



Google Scholar provides a simple way to broadly search for scholarly literature. From one place, cross search is possible in many disciplines and sources: peer-reviewed papers, theses, books, abstracts and articles from academic publishers, professional societies, preprint repositories, universities and other scholarly organizations. It helps in identifying the most relevant research across the world of scholarly research. GS works with publishers of scholarly information to index peer-reviewed papers, theses, preprints, abstracts and technical reports from all disciplines of research and make them searchable on Google and Google Scholar. Ranking of articles is done according to: weighing the full text of each article, the author, the publication in which the article appears, and how often the piece has been cited in other scholarly literature. GS claims to place the most relevant results always on the first page.

Some Features:

- Search diverse sources from one convenient place
- Find papers, abstracts and citations
- Locate the complete paper through patron's library or on the web
- Learn about key papers in any area of research
- Google Scholar strongly recommends indexing full-text versions of the work to be submitted to GS.
- Indexes magazines that are suitable primarily for a scholarly audience
- Google Scholar indexes only scholarly articles. For textbooks and monographs Google Book Search can be used
- Indexes Research Articles of the Professional society
- Indexes Dissertations and Technical Reports
- Usage Statistics Available through web server logs
- No charge for Google Scholar referrals
- Indexing of Searchable PDF, HTML, PostScript, compressed PostScript (ps.gz), and compressed PDF (pdf.gz)
- Google Scholar strongly recommend preserving the full PDF layout information.
- Google Scholar recommends for providing authoritative metadata for the Better ranking of articles.

Google Advanced Search: Screenshot

Google Scholar **Advanced Scholar Search** [Advanced Search Tips](#) | [About Google Scholar](#)

Find articles with **all** of the words
with the **exact phrase**
with **at least one** of the words
without the words
where my words occur

10 results

anywhere in the article

Author Return articles written by
e.g., "PJ Hayes" or McCarthy

Publication Return articles published in
e.g., J Biol Chem or Nature

Date Return articles published between
and
e.g., 1996

Subject Areas Return articles in all subject areas.
 Return only articles in the following subject areas:

- Biology, Life Sciences, and Environmental Science
- Business, Administration, Finance, and Economics
- Chemistry and Materials Science
- Engineering, Computer Science, and Mathematics
- Medicine, Pharmacology, and Veterinary Science
- Physics, Astronomy, and Planetary Science
- Social Sciences, Arts, and Humanities

Google Scholar Search Results Display

The screenshot shows a Windows Internet Explorer browser window displaying Google Scholar search results for the query "digital preservation". The search results are as follows:

- [BOOK] Avoiding Technological Quicksand: Finding a Viable Technical Foundation for Digital Preservation - group of 2 »**
 J Rothenberg - 1999 - Council on Library & Information Resources
 ... Avoiding Technological Quicksand: Finding a Viable Technical Foundation for Digital Preservation. Purchase this Book Purchase this Book. ...
 Cited by 93 - [Related Articles](#) - [Web Search](#) - [Import into BibTeX](#)
- Digital Preservation: A Time Bomb for Digital Libraries - group of 5 »**
 M Hedstrom - Computers and the Humanities, 1997 - Springer
 ... Digital Preservation: A Time Bomb for Digital ... Digital preservation is largely experimental and replete with the risks associated with untested methods. ...
 Cited by 42 - [Related Articles](#) - [Web Search](#) - [Import into BibTeX](#) - [BL Direct](#)
- Emulation as a Digital Preservation Strategy - group of 6 »**
 S Granger - D-Lib Magazine, 2000 - dlib.org.ar
 ... 9873 Emulation as a Digital Preservation Strategy. ... obsolete? Emulation as a Strategic Digital Preservation Strategy - Some Imaginary Scenarios. ...
 Cited by 40 - [Related Articles](#) - [Cached](#) - [Web Search](#) - [Import into BibTeX](#)
- The paradox of digital preservation - group of 11 »**

3.1.1. Google – Severing the Libraries and the Librarians

Google Scholar helps the patrons to utilize the resources the library provides. Google provides two solutions to help library visitors locate scholarly literature within library's electronic and print resources.

3.1.2 Library Links Program

For libraries that make their resources available via a link resolver, Google has the option to include a link for their patrons to these resources as a part of the GS search results. On-campus users at participating libraries can locate additional links in GS search results which facilitate access to their library's resources. These links lead to the library's servers which, in turn, direct them to the full-text of the article.

3.1.3 OCLC Open Worldcat programme and Google Scholar

For libraries that have their holdings listed in OCLC's Open WorldCat, we have a link for each GS book result that leads to the Open WorldCat database where users can find the book in a local library. Libraries will need to join the OCLC Open Worldcat program in order to be included as a part of the 'Library Search' link. Individual libraries can also work with the national library organization or union catalog to provide a library search service similar to Open WorldCat and then contact GS. Library links and library search are free services. Some important points are:

- For off campus users libraries will have to authenticate their patrons
- Libraries can limit access to the holdings and registration data
- Electronic holdings information is necessary for participating in the library links program
- Library proxy should work with scholar.google.com and proxy address is within the specified IP range
- Electronic holdings information is needed to highlight links to full text and to have the option of using a different label for full text and print holdings

3.1.4 Link resolver

Google Scholar knows which journals library has, but it does not know who serves them to the library. The link resolver takes the journal information and returns the correct URL to allow users to access the article.

Google Book Search	Search the full text of books to find once that interest readers and give location where to buy or borrow them.
Google Blog Search	Blog Search is Google search technology focused on blogs. Google is a strong believer in the self-publishing phenomenon represented by blogging, and it hopes Blog Search will help users to explore the blogging universe more effectively, and perhaps inspire many to join the revolution themselves.
Google Groups	Google Groups is a free service which helps people form online communities based around shared interests. One can create his/her own groups and mailing lists, and search over all public Google Groups content, including more than 1 billion postings from the Usenet bulletin board service. Every group has its own unique email address and Google-fast search, making it easy to find discussions from deep in respective group's archive.

3.2 Scirus



Scirus is a powerful Internet search tool developed especially for finding scientific information. The wealth of scientific information and academic knowledge accessible via the Web is virtually limitless. But accessibility to this wealth of knowledge is proving to be more complicated and time-consuming day by day. It has been developed especially for scientists, researchers and students. It enables anyone searching for scientific information to pinpoint the information they need - including peer-reviewed articles, patent information, author home pages and university web sites - quickly and easily.

3.2.1 Scirus: Historical Background

Scirus was a seer who came from Dodona at the time of the war between Eleusis and Athens. He was killed in this war, and the place Scirum near Eleusis was named after him. The business of seers or prophets has been thought to be that of judging the signs of what is yet to come. For example, a seer knew whether a man would meet death, disease or loss of property, or in time of war, whether he would meet victory or defeat. They often interpreted the will of heaven by explaining dreams, watching the flights of birds, or gazing at the entrails of sacrificed victims. Scirus supports scientists in their role as seers.

Innovative features:

- Searches the whole web including access-controlled sites
- Targets scientific information only
- Covers more than 250 million science related pages
- Finds more peer-reviewed articles than any other search engine
- Reads non-text files in PDF, Postscript and others
- Yields more precise results because it indexes complete documents
- Pinpoint scientific, scholarly, technical and medical data on the Web.
- Find the latest reports, peer-reviewed articles, patents, pre prints and journals that other search engines miss.
- Offer unique functionalities designed for scientists and researchers.

Scirus crawls and indexes scientific sites and adds a classification to these sites, which gives scientists the possibility of searching within subject related areas. This enables scientists to chart and pinpoint data, locate University sites, and find reports and articles in a clutter-free, user-friendly and efficient manner.

Scirus Advanced Search: Screenshot

scirus
for scientific information only

[About Us](#) |
 [Newsroom](#) |
 [Advisory Board](#) |
 [Submit Web Site](#) |
 [Search Tips](#) |
 [Contact Us](#)

[Advanced Search](#) |
 [Basic Search](#) |
 [Search Preferences](#)

in

AND in

Dates	Only show results published between <input type="text"/> 1920 and <input type="text"/> 2006		
Information types	Only show results that are <input checked="" type="checkbox"/> Any information type <input type="checkbox"/> Abstracts <input type="checkbox"/> Articles <input type="checkbox"/> Books <input type="checkbox"/> Company homepages <input type="checkbox"/> Conferences <input type="checkbox"/> Patents <input type="checkbox"/> Preprints <input type="checkbox"/> Scientist homepages		
File formats	Only show results that are <input checked="" type="checkbox"/> Any format <input type="checkbox"/> PDF <input type="checkbox"/> HTML <input type="checkbox"/> Word <input type="button" value="List more file types"/>		
Content sources	Only show results from <table border="1"> <tr> <td> Journal sources <input checked="" type="checkbox"/> All <input type="checkbox"/> BioMed Central <input type="checkbox"/> Crystallography Journals Online <input type="checkbox"/> MEDLINE/PubMed <input type="checkbox"/> Project Euclid <input type="checkbox"/> ScienceDirect <input type="button" value="List more sources"/> </td> <td> Preferred Web sources <input checked="" type="checkbox"/> All <input type="checkbox"/> E-Print ArXiv <input type="checkbox"/> CogPrints <input type="checkbox"/> NASA <input type="checkbox"/> Patent Offices <input type="checkbox"/> RePEc <input type="button" value="List more sources"/> </td> </tr> </table> <input checked="" type="checkbox"/> The rest of the scientific web	Journal sources <input checked="" type="checkbox"/> All <input type="checkbox"/> BioMed Central <input type="checkbox"/> Crystallography Journals Online <input type="checkbox"/> MEDLINE/PubMed <input type="checkbox"/> Project Euclid <input type="checkbox"/> ScienceDirect <input type="button" value="List more sources"/>	Preferred Web sources <input checked="" type="checkbox"/> All <input type="checkbox"/> E-Print ArXiv <input type="checkbox"/> CogPrints <input type="checkbox"/> NASA <input type="checkbox"/> Patent Offices <input type="checkbox"/> RePEc <input type="button" value="List more sources"/>
Journal sources <input checked="" type="checkbox"/> All <input type="checkbox"/> BioMed Central <input type="checkbox"/> Crystallography Journals Online <input type="checkbox"/> MEDLINE/PubMed <input type="checkbox"/> Project Euclid <input type="checkbox"/> ScienceDirect <input type="button" value="List more sources"/>	Preferred Web sources <input checked="" type="checkbox"/> All <input type="checkbox"/> E-Print ArXiv <input type="checkbox"/> CogPrints <input type="checkbox"/> NASA <input type="checkbox"/> Patent Offices <input type="checkbox"/> RePEc <input type="button" value="List more sources"/>		
Subject areas	Only show results in <input checked="" type="checkbox"/> All subject areas <input type="checkbox"/> Agricultural and Biological Sciences <input type="checkbox"/> Astronomy <input type="checkbox"/> Chemistry and Chemical Engineering <input type="checkbox"/> Computer Science <input type="checkbox"/> Earth and Planetary Sciences <input type="checkbox"/> Economics, Business and Management <input type="checkbox"/> Engineering, Energy and Technology <input type="checkbox"/> Environmental Sciences <input type="checkbox"/> Languages and Linguistics <input type="button" value="List more subject areas"/>		

Scirus Search Results Display

The screenshot displays the Scirus search interface. At the top, the browser title is "digital preservation" results on scirus.com, for scientific information. The search bar contains the query "digital preservation". Below the search bar, there are four checked options: "Journal sources", "Preferred Web sources", "Other Web sources", and "Exact phrase". The search results summary shows: Searched for: The exact phrase "digital preservation"; Found: 33,990 total | 84 journal results | 342 preferred web results | 33,564 other web results; Sort by: relevance | date. The first result is "Digital preservation" (5K) from Jan 2006, with a snippet mentioning "Digital preservation Home About the KB Expertise & development e-Depot and digital preservation Digital preservation research Focal points of digital preservation...". The second result is "Why Digital Preservation?" (25K) from Jun 2005, with a snippet mentioning "Coalition DP Links DP List Digital Preservation Focus Preservation Management...programmes Reports Strategies Why Digital Preservation? The use of computers is...pro-active preservation is needed. Digital". A sidebar on the right titled "Refine your search using these keywords found in the results:" lists various related terms like "archival storage", "asset management", "digital media", etc.

Basic	Scirus offers two general search options: “basic” and “advanced”. In the basic, keyword search option, the default is set to search “All journal sources” and “All web sources”. Users can change these default options by deselecting the option(s) of interest in their respective check boxes. Within the basic search, users can search by “Exact phrase” by selecting that option. Keywords can be combined using one (or more) Boolean operators (i.e. “OR”, “AND” “NOT”) (http://www.scirus.com/srsapp/tips/) (e.g. red squirrel or Sciurus vulgaris) and also searched by using field codes.
Advanced searching	Users can also search Scirus using an “Advanced search” interface. The advanced search allows the user to search “The complete document”, “Article title”, “Journal title”, “Author name(s)”, “Author affiliation(s)”, “Keyword(s)”, “ISSN”, or “(Part of a) URL” by selecting the option of interest from a drop-down menu. An initial search statement (e.g. “red squirrel”) can be combined with another by selecting the search type (i.e. “All of the words”, “Any of the words”, “Exact phrase”) and by entering a secondary search term or phrase (e.g. “Sciurus vulgaris”) in a different, yet identical search box. Search statements can be combined by selecting the Boolean operator of interest (AND, OR, ANDNOT) from the associated drop-down menu.

3.2.2 Field codes

Within the basic search (as well as the advanced search), users can restrict a search to one of several select record fields using field codes. Field codes must be followed by a colon (“:”), with no spacing after the colon as follows:

- * “au” [author] (e.g. “au:Harnad”).
- * “ti” [title keyword] (e.g. “ti:game”).
- * “jo” [journal] (e.g. “jo:Pratiques psychologiques”).
- * “ke” [keyword] (e.g. “ke:orthogonal polynomials”).
- * “url” [URL] (e.g. “url:http://arxiv.org/abs/nlin/0410043”).
- * “dom” [domain] (e.g. “dom:org”).
- * “af” [author affiliation(s)] (e.g. “af:Université du Québec”) (<http://www.scirus.com/srsapp/tips/>).

As a service for users, Scirus provides free access to the “Latest Scientific News – from New Scientist” in the upper left-hand corner of the basic search page (www.scirus.com/srsapp/news/).

3.2.3 Search limits

Within the advanced search, users can limit results by one of several options, notably date range, “Information types”, “File formats”, “Content sources”, and/or “Subject areas”. Using a drop-down menu, users can limit a search for the period 1920 to 2006, or any year in between these years. In addition, a search can be limited to all or a select number of “Information types” (i.e. “Abstracts”, “Articles”, “Books”, “Company homepages”, “Conferences”, “Patents”, “Preprints” and/or “Scientist homepages”). A search can also be limited by one or more journal collections, notably BioMed Central, Crystallography Journals Online, Project Euclid, ScienceDirect, Scitation, and the e-journals published by the Society for Industrial & Applied Mathematics. In addition, the user can also include (or exclude) access to references in PubMed MEDLINE.

Journal Sources	BioMed Central, Crystallography Journals Online, Institute of Physics Publishing, MEDLINE/PubMed, Project Euclid, ScienceDirect, Scitation, Society for Industrial & Applied Mathematics, and Pubmed Central
Preferred Web Sources	E-Print ArXiv, CogPrints, NASA, Patent Offices, RePEc, DiVA, Univ. Toronto T-Space, MIT OpenCourseWare, NDLTD, Caltech, HKUST, Organic Eprints, PsyDok, Curator and Digital Archives
Other Web Sources	The rest of the scientific web

3.2.4 Subject areas:

Agricultural and Biological Sciences, Astronomy, Chemistry and Chemical Engineering, Computer Science, Earth and Planetary Sciences, Economics, Business and Management, Engineering, Energy and Technology, Environmental Sciences, Languages and Linguistics, Law, Life Sciences, Materials Science, Mathematics, Medicine, Neuroscience, Pharmacology, Physics, Psychology, Social and Behavioral Sciences and Sociology.

3.2.5 Advantages of Using Scirus

Search engines are all different in the Web sites they cover, and the way they classify these Web sites. Scirus, the search engine for science, focuses only on Web pages containing scientific content. Searching more than 250 million science-related pages, Scirus helps quickly locating scientific information on the Web:

- Filters out non-scientific sites. For example, if we search on REM, Google finds the rock group - Scirus finds information on sleep, among other things
- Finds peer-reviewed articles such as PDF and PostScript files, which are often invisible to other search engines.
- Searches the most comprehensive combination of web information, preprint servers, digital archives, repositories and patent and journal databases. Scirus goes deeper than the first two levels of a Web site, thereby revealing much more relevant information.

3.2.6 Pinpointing Scientific Information

Scirus has a wide range of special features to help researchers pinpoint the scientific information they need. Scirus, helps:

- Select to search in a range of subject areas including health, life, physical and social sciences.
- Narrow the search to a particular author, journal or article.
- Restrict the results to a specified date range.
- Find scientific conferences, abstracts and patents.
- Refine, customize and save the searches made.

3.2.7 Ranking of Results

Search results in Scirus are, by default, ranked according to relevance. It is also possible to rank results by date. This can be done by clicking the Rank by date link on the Results Page. Scirus uses an algorithm to calculate ranking by relevance. This ranking is determined by two basic values:

- Words - the location and frequency of a search term within a result account for one half of the algorithm. This is known as static ranking.
- Links - the number of links to a page account for the second half of the algorithm – the more often a page is referred to by other pages, the higher it is ranked. This is known as dynamic ranking. Overall ranking is the weighted sum of the static and dynamic rank values. Scirus does not use metatags, as these are subject to ranking-tweaking by users.

3.2.8 The Range of Scientific Content Scirus Covers

Scirus returns results from the whole Web, including access-controlled sites that other search engines don't index. Scirus currently covers over 250 million science-related Web pages, including:

Sites	No. (Million)
.edu sites	83
.org sites	25
.ac.uk sites	10
.com sites	22
.gov sites	6.5
relevant STM and University sites from around the world	68+

Sources	No.
ArXiv.org e-prints	3,63,500
BioMed Central	13,000
Caltech Coda	6,000
Cogprints	2,600
Crystallography Journals Online	65,500
CURATOR	1,700
Digital Archives	3,90,000
DiVa	11,000
Project Euclid	35,500
HKUST Institutional Repository	2,200
Institute of Physics Publishing	2,12,000
LexisNexis	13 Million
Medline citations via PubMed	17.3 Million
MIT OpenCourseWare	63,000
NASA	12,000
NDLTD	2,37,500
Organic Eprints	5,200
PsyDok	600
PubMed Central	3,68,000
RePEc	1,80,000
ScienceDirect	6.6 Million
Scitation	3,30,000
SIAM	8,800
T-Space	4,400

3.2.9 Scirus Downloads

- Scirus Search Box: To give library's Web site greater functionality and enhance the experience of users.
- Scirus Toolbar: To help finding scientific, technical and medical information on the Web easily and quickly.

3.3 Windows Live Academic



Windows Live Academic searches academic journals and content for article titles, author names, article abstracts, and conference proceedings. It claims to help in pinpointed search by eliminating irrelevant content thus saving precious time of the users. It can sort the results by author, date, publication, and conference. The service is currently in beta which means it hasn't been officially launched but is fully functional and ready to use.

The new search service is designed to help students, researchers and university faculty to conduct research across a spectrum of academic journals. The program is a cooperative effort between WLA Search, industry association CrossRef and many leading publishers. WLA search will offer peer-reviewed content from leading scholarly societies such as the Institute of Electrical and Electronics Engineers (IEEE), the Association for Computing Machinery (ACM), and leading publishers Elsevier and John Wiley & Sons Inc.

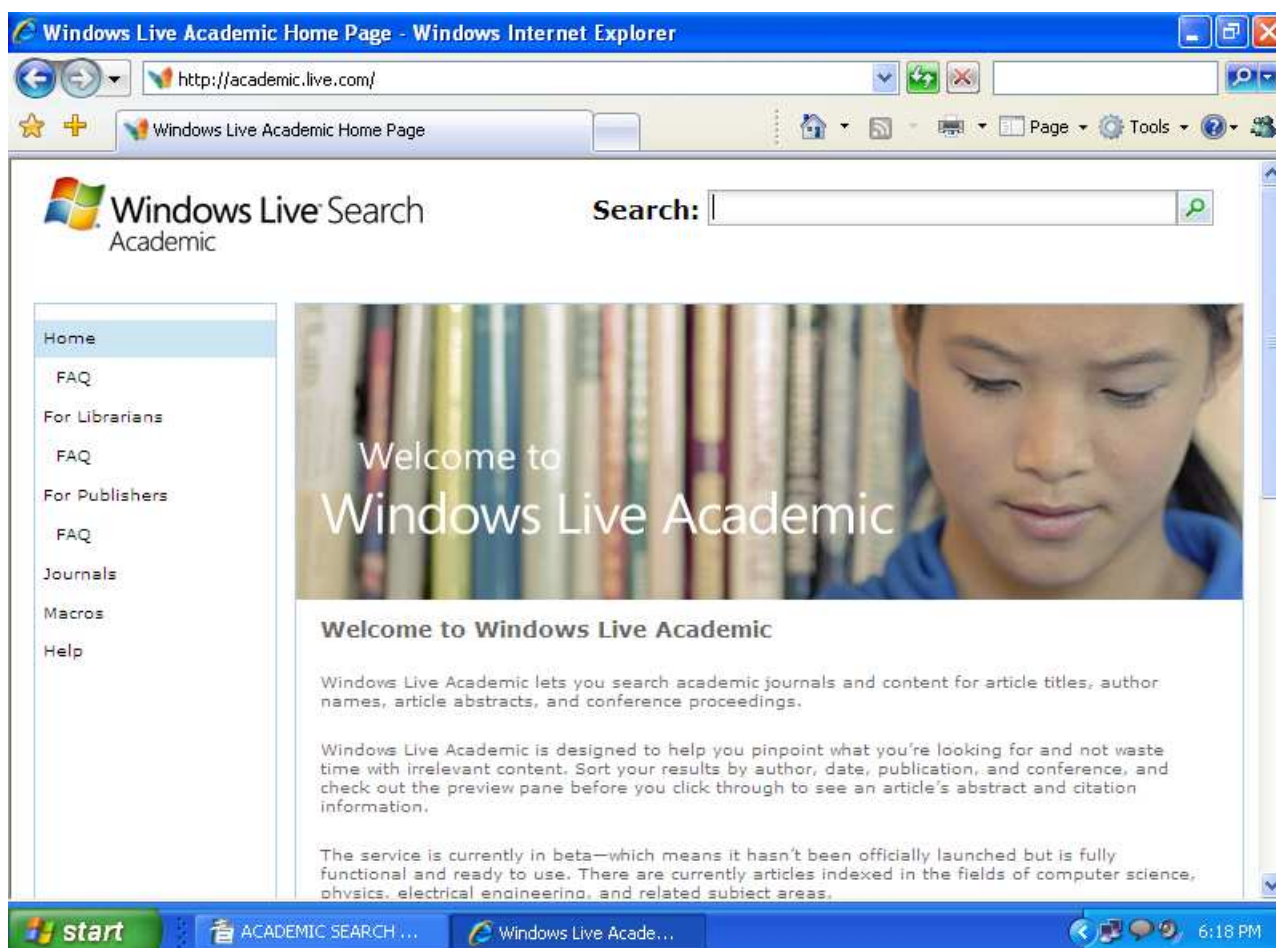
Features:

- Enable consumers to search through thousands of academic journals, serving as a powerful research aid
- Innovative user interface and sorting functionality have been designed to help consumers find information faster and truly give them an advantage in their research efforts.
- A preview pane, which allows customers to see the abstract of a result quickly by simply hovering their mouse over the result.
- The ability to group and sort results by author, journal, conference and date rather than just looking at a flat list of search results.
- Citation support in two major bibliographic formats, which enables customers to quickly compile citations.
- Author "live links" that will automatically connect to the search results of articles associated with a particular author by simply clicking on the hyperlink of the author's name.
- A detail slider, which allows consumers to control the amount of information they see in the search results.

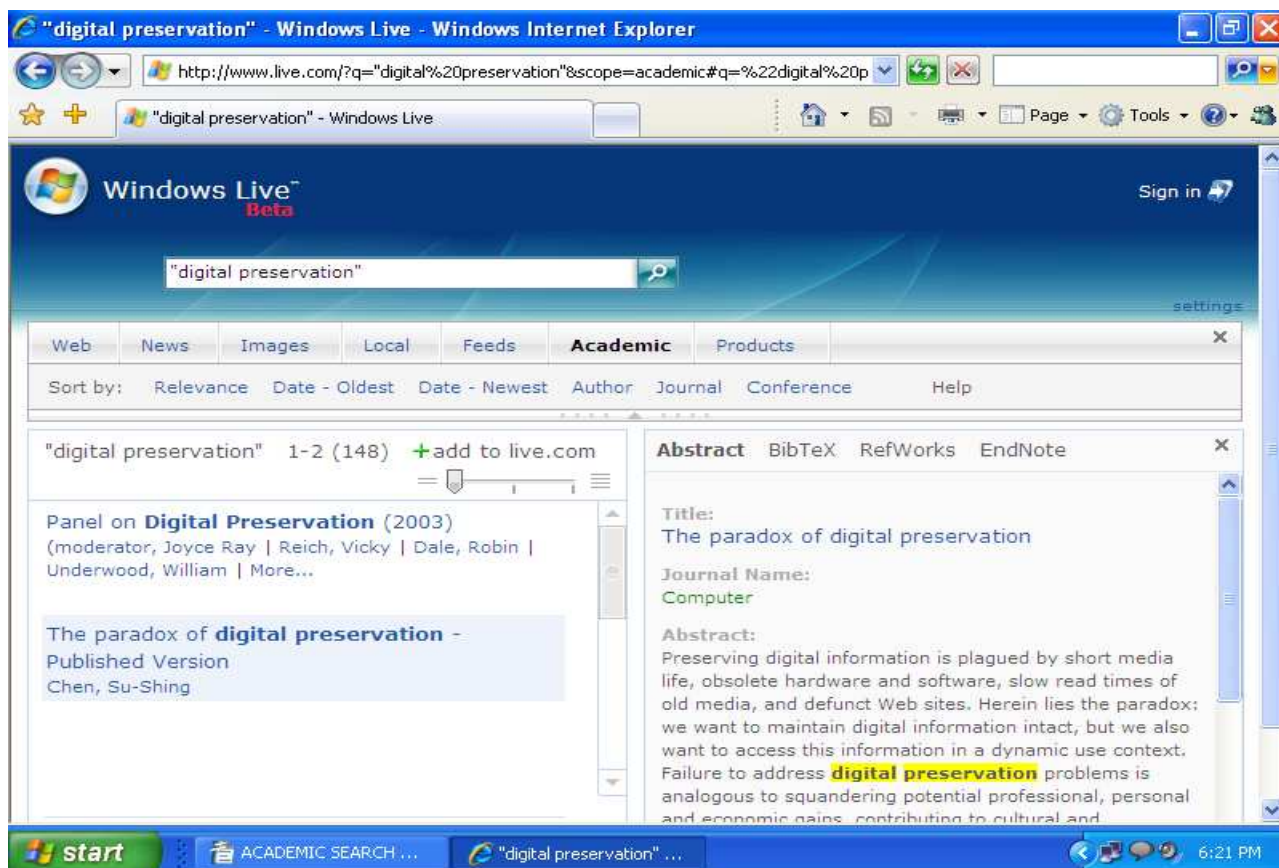
- Direct links to publishers' published version, which allows customers to seamlessly access the full text of the article if they are on the network of the institution that subscribes to the full text.
- Support for macros, which allow users to more finely tune their search results.
- Researchers can stay informed of the latest developments in their field or area of study by submitting their academic query to live.com with a single click at the top of the page. When a new article related to that search is posted, they are alerted instantly via an RSS feed.
- WLA indexes content is in PDF format

Other organizations working with Microsoft on the Windows Live Academic Search tool include the IEEE, the ACM, Taylor & Francis Group, the American Institute of Physics, the American Physical Society, the Institute of Physics, Ex Libris Group, TDNet, Blackwell Publishing, Elsevier, Nature Publishing Group, the British Library, OCLC Online Computer Library Center and John Wiley & Sons Inc.

Windows Live Academic: Screenshot



Windows Live Academic Search Results Display



3.3.1 Working and User Interface

When any search is made, WLA displays the results in the following format:

- Slider bar:** To change the amount of visible information.
- Preview pane:** Hover over a result to see more info about an article before clicking through to it.
- Abstract:** Click this to display an article's abstract (if available) in the Preview Pane.
- BibTeX/EndNote:** Click this to see an article's formatted citation (in BibTeX or EndNote format)
- Search result:** This is the search result itself, including (when available) links to the full text of the paper, and to a search of one's own library for that article.
- Sort by:** This is a drop-down menu for sorting results by author, journal, conference, date, and relevance. Further sort the results with the most recent articles first, or with the oldest articles first.

Relevance ranking	WLA determines relevance using an algorithm based on two areas: <ol style="list-style-type: none"> 1. Quality of the match between the search term and the content of the paper. 2. Authoritativeness of the paper. It is currently not using citation A count as a factor in determining relevance, but it may be considered as a criterion in future.
Open Access Repositories	Windows Live Academic has implemented the Open Archives Initiative (OAI) protocol for indexing OAI-compliant repositories. For example, it indexes the content present in ArXiv.org for the launch and it will continue to index more repositories in future. Windows Live Academic can access OAI-MPH compliant repositories
Open URL	WAL supports industry standards. Users can click on the link to the library open URL resolver to determine the availability of full text access.
Recognition of parent institution	Through IP address
Content Indexing	Through Crossref. CrossRef is a non-profit organization that collaborates with publishers to make reference linking efficient and reliable throughout online scholarly literature.

3.3.2 Importance for libraries

WLA offers a better way to do academic research: a single, easy-to-use tool that gives users relevant, focused results and usable content. Windows Live Academic works with librarians to help their institutions' patrons find the information they need. Windows Live Academic wants to work closely with librarians to satisfy their needs and the needs of library patrons. WLA indexes library-subscribed content, and works with libraries to provide access links to users. Institution's patrons who use Windows Live Academic will increase the use of the material subscribed by the libraries, which in turn increases library's value to the patrons.

3.3.3 Importance for Publishers

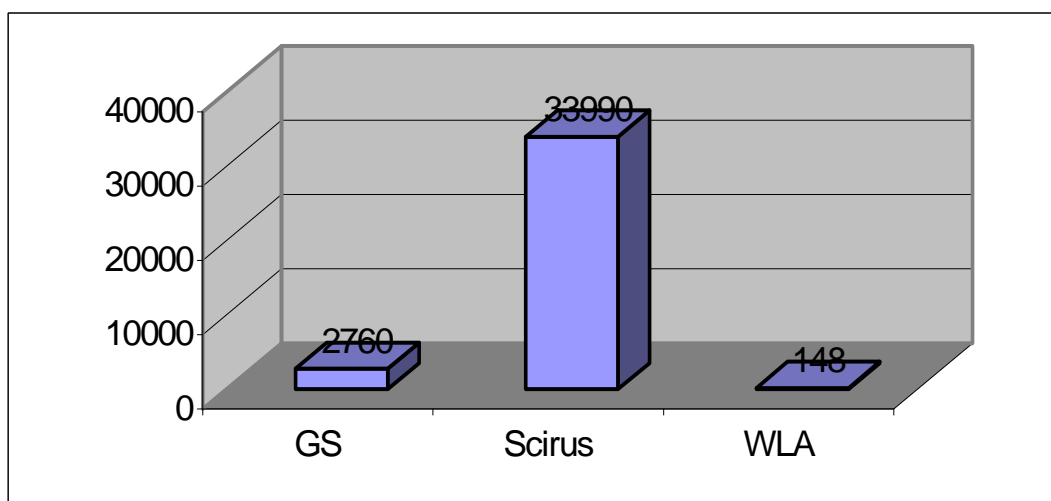
- Helps publishers connect with more readers, more easily
- Full copyright protection
- Committed to work and cooperate with industry associations. Better control over published material
- Greater readership
- Increased traffic to publishers Web sites
- Greater usage of aggregated sources of information that an academic library may subscribe to
- Generate incremental demand for articles in non-subscribing institutions, which has the potential to grow their subscription business

3.3.4 Searching the three search engines:

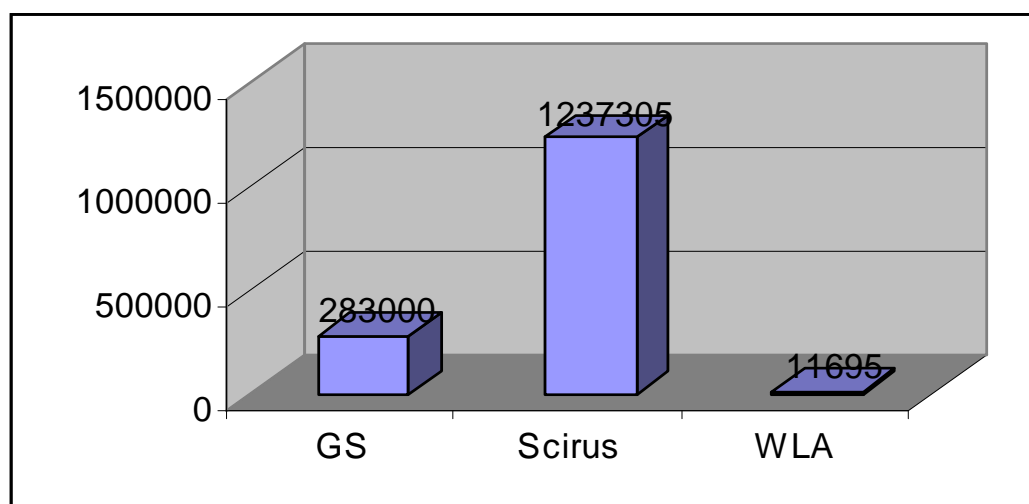
To evaluate the performance of these three search engines various key terms were given to all the three one by one. The keywords were chosen from the theme and sub-theme of the PLANNER 2006. The results of various searches and categories are being summarized below:

A. Evaluating Number of Search Results

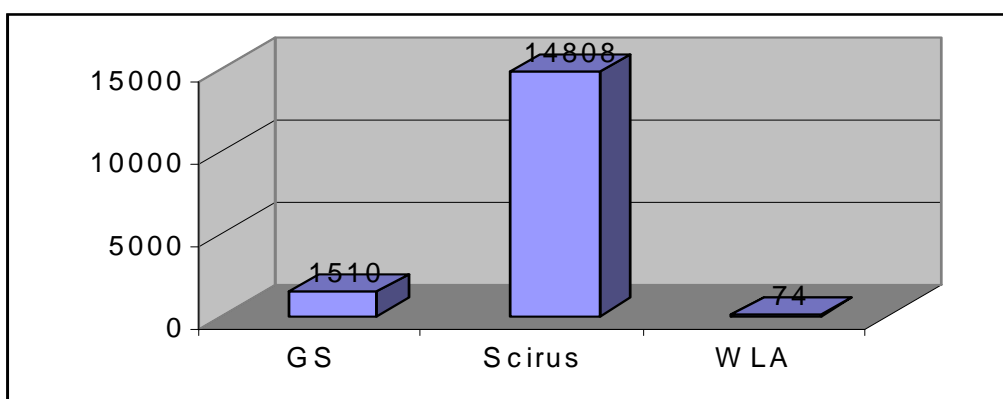
1. Keyword: Digital Preservation (exact phrase)



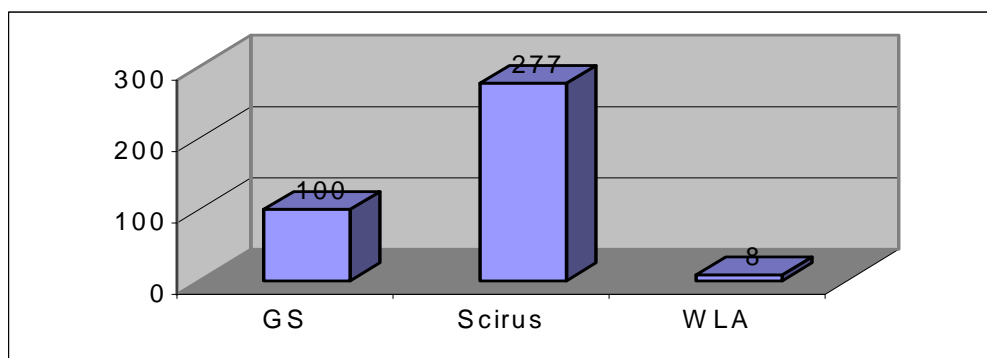
2. Keyword: Metadata



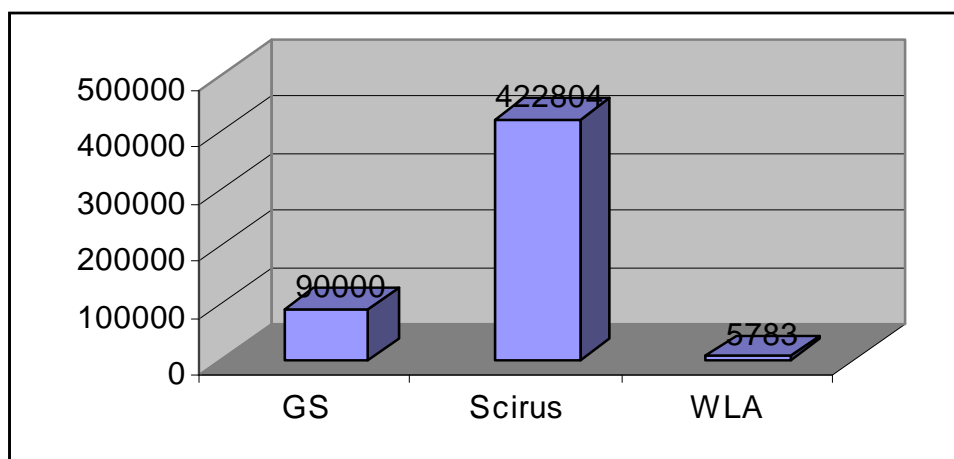
3. Keyword: Institutional Repositories (exact phrase)



4. Keyword: Open Archives Initiative (exact phrase)

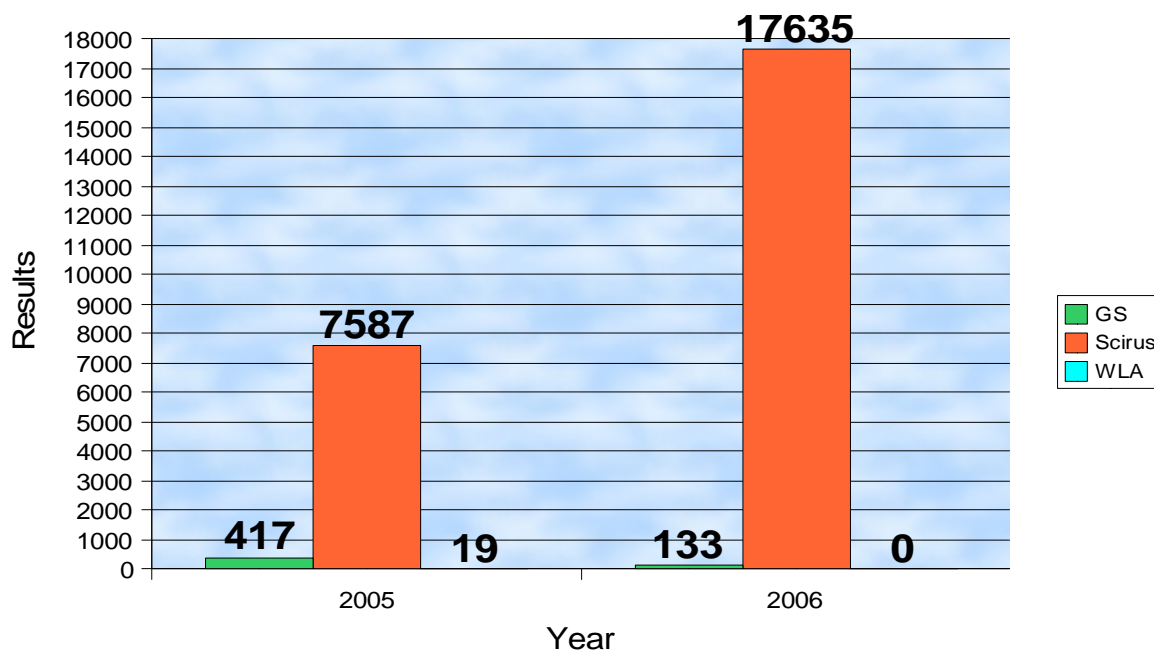


5. Keyword: Open Access (exact phrase)

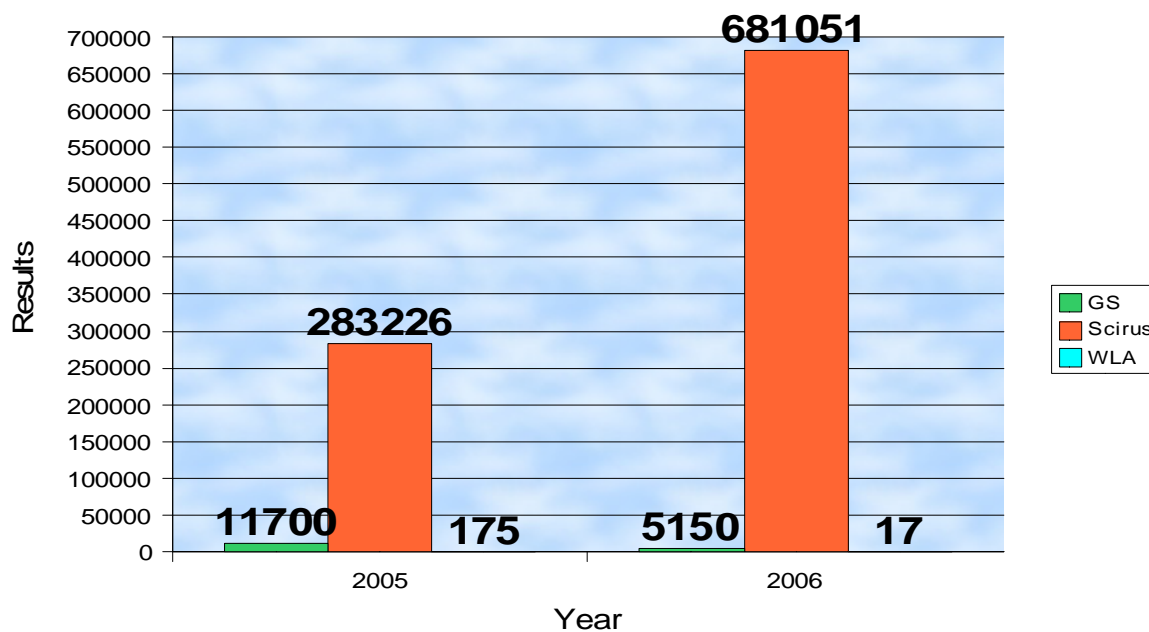


B. Evaluating Recency of Search Results

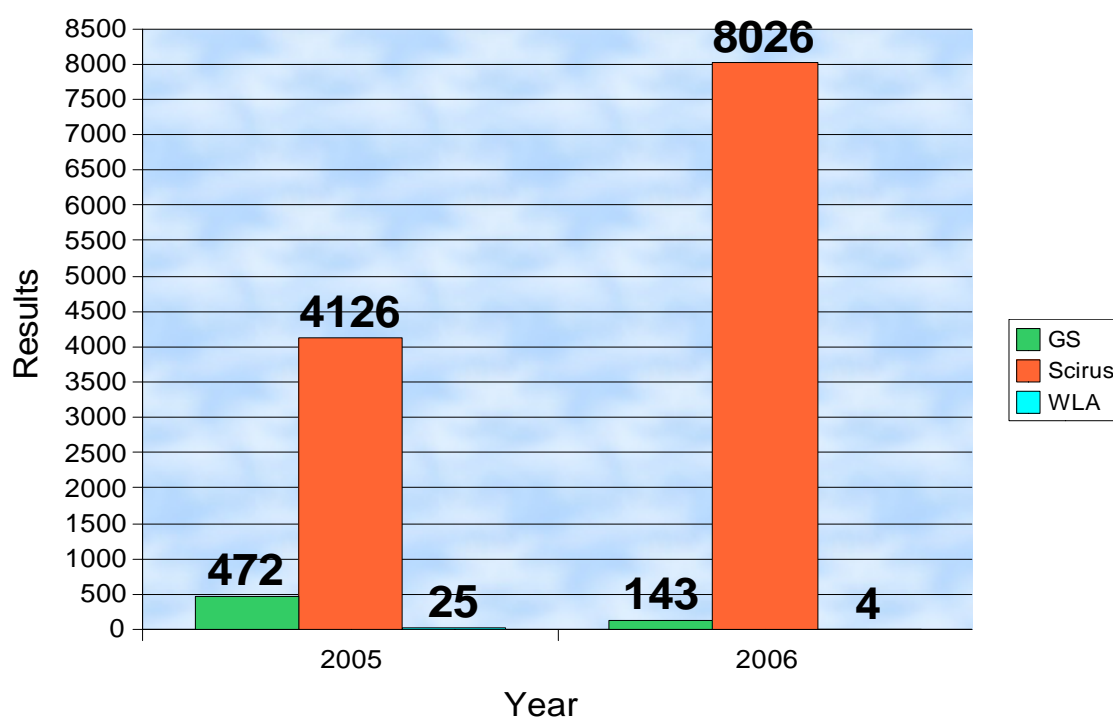
1. Keyword: Digital Preservation (exact phrase)



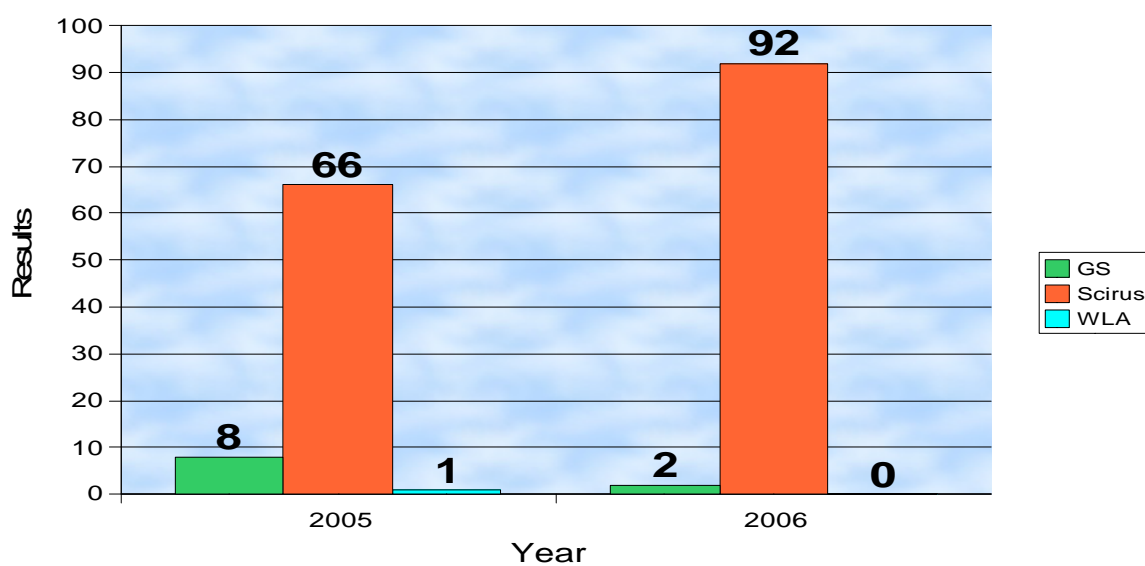
2. Keyword: Metadata



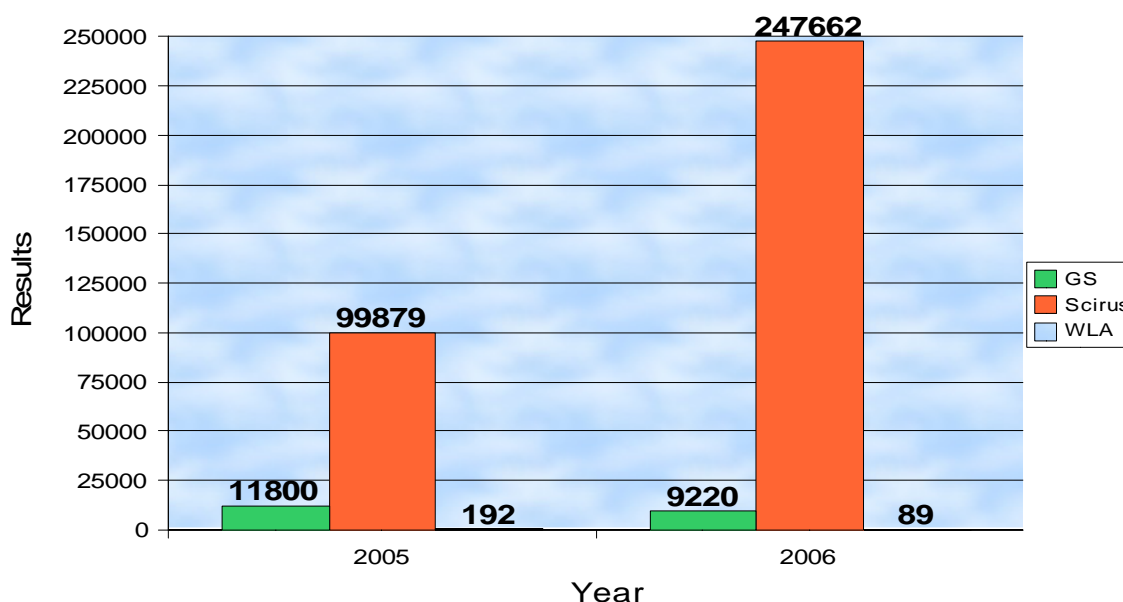
3. Keyword: Institutional Repositories (exact phrase)



4. Keyword: Open Archives Initiative (exact phrase)



5. Keyword: Open Access (exact phrase)



Conclusion

We are living in the world of information overload. This information resides at numerous places in different formats. But the tragedy is this information is not having a single window access. Moreover, there exists no robust and full proof solution to access the giant invisible web. The method of information storage and publication includes conventional methods as well as new tools like institutional repositories, blogs, wikis and other grey literature publication methods. Most of them allow to publish the content taking within no time (lesser than cooking time of instant noodles). But the important question is whether users are empowered with any single search mechanism which enables them to search *all* that exists in one's desirable area of research? Whether the search tools of today have the capacity to hunt down all the information dissemination tools simultaneously or users are forced to deploy different search tools for the same query. The extent to which the search engines of today qualifies to this demand is significant for researchers and academicians. Ultimately, we need a search engine which searches the whole web (visible and invisible), retrieves meaningful results, is fast, helps users in easy navigation and user friendly user interface and customizable, sorts the results by various parameters including commercial and open access content. Scirus, Google Scholar, Windows Academic Live are offering a win-win scenario for consumers and the content providers but we are waiting for the time when they come out to be a perfect "academic search engine" and a trusted friend of researchers. Our study leads us to the conclusion that Google still remains the popular search engine when viewed along with Google Book Search, Google Blog, Google Group whereas Scirus is perhaps the most comprehensive and customizable search provider. Windows Academic Live is still in Beta stage and only time can tell how it matures with the passage of time.

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