

Supporting serious research: rankings, funding, impact and databases for uncovering hidden gems

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Science & Technology

What's driving Universities?



How Are Universities Ranked? Research Output and Impact

Times Higher Education (THE) Rankings

• <i>Teaching</i> — the learning environment:	30%
• <i>Research</i> — volume, income and reputation:	30%
• <i>Citations</i> — research influence:	30%
• <i>Industry income</i> — innovation:	2.5%
• <i>International outlook</i> — staff, students & research (with new metric of extent of international cooperation in research):	7.5%

62%

QS World University Rankings

Academic reputation

40%,

Employer reputation

Faculty student ratio

20%,

Citations per faculty

20%,

Number of international faculty members

Number of international students

20+++?%

10%,

5%

5%.

ARWU (Shanghai Jao Tong) Rankings

75%

Indicators and Weights for ARWU - FIELD

Code	Weight	SCI	ENG	LIFE
Alumni	10%	Alumni winning Nobel Prizes since 1951	Not Applicable	Alumni winning Nobel Prizes since 1951
Award	15%	Staff winning Nobel Prizes since 1961	Not Applicable	Staff winning Nobel Prizes since 1961
Highly Cited	25%	Highly cited researchers in 5 categories:	Highly cited researchers in 3 categories:	Highly cited researchers in 8 categories:
		◆ <i>Mathematics</i>	◆ <i>Engineering</i>	◆ <i>Biology&Biochemistry</i>
		◆ <i>Physics</i>	◆ <i>Computer Science</i>	◆ <i>Molecular Biology&Genetics</i>
		◆ <i>Chemistry</i>	◆ <i>Materials Science</i>	◆ <i>Microbiology</i>
		◆ <i>Geosciences</i>		◆ <i>Immunology</i>
		◆ <i>Space Sciences</i>		◆ <i>Neuroscience</i>
				◆ <i>Agricultural Sciences</i>
				◆ <i>Plant&Animal Science</i>
				◆ <i>Ecology/Environment</i>
Publishing Volume	25%	Papers Indexed in Science Citation Index-Expanded in SCI fields	Papers Indexed in Science Citation Index- Expanded in ENG fields	Papers Indexed in Science Citation Index- Expanded in LIFE fields
Top Journals Publishing	25%	Percentage of papers published in top 20% journals of SCI fields to that in all SCI journals	Percentage of papers published in top 20% journals of ENG fields to that in all ENG journals	Percentage of papers published in top 20% journals of LIFE fields to that in all LIFE journals

From Publish or Perish to **Get Cited or Perish**

Quantity \neq Quality

Quality is most often measured by amount of
Citations (Impact Factors, Eigen Factors, H Index)

From Publish or Perish to “get cited or perish”.

Thomson Reuter’s SCI

Elsevier’s Scopus

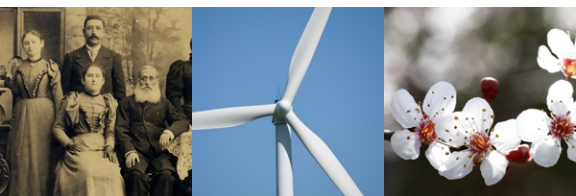
Examples of Government lead initiatives:

Research Excellence Framework (UK) (New)

Excellence in Research Australia (ERA) (New)

Supporting Advanced Researchers

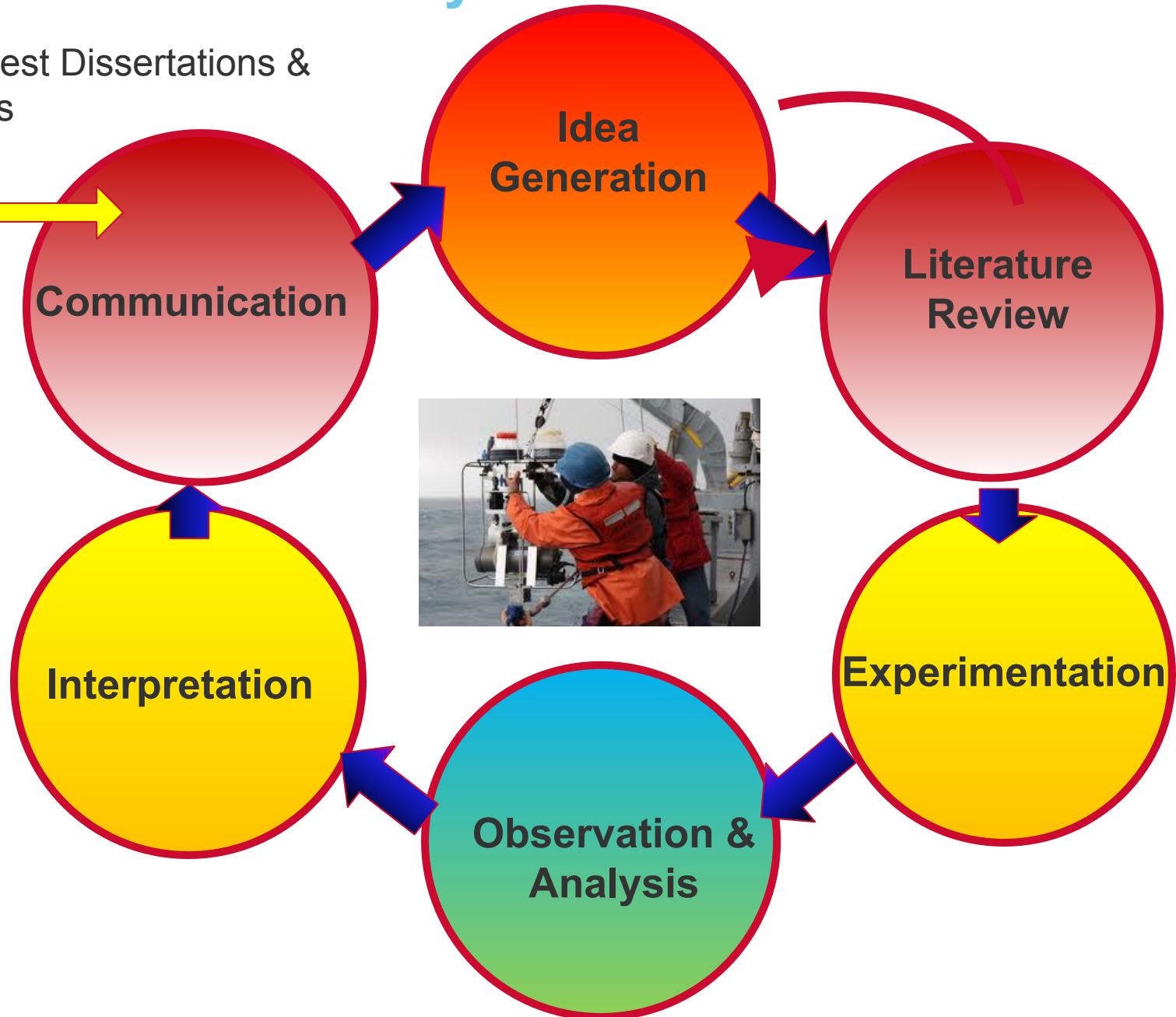
Support for **advanced**
researchers is **vital** to the
university's *status, ranking*
and **funding**



Supporting Serious Researchers

Research Lifecycle

ProQuest Dissertations &
Theses



Research / publishing process

1. Defining a topic
2. Reviewing the literature
3. Writing a draft
4. Submission
5. Peer review
6. Revision
7. Publication!

Defining a Topic

Doctoral Theses/Dissertations are required to make an **original** contribution to the literature of the discipline

Funding may be available for particular fields or topics but application will be **rejected if the research duplicates** existing research without specific justification

You don't want to waste years researching something that has already been done

Reviewing the literature

“The ‘number one fear’ of doing a literature review is that you will miss something.”

“Not including your reviewers in your references would very likely be a costly omission.”

“If the references are incomplete, that’s it, your article will not be published.”

So you still really need specialised A&I?

A&I? Yes..Seriously...what else are you going to use???

- Full text only? Not comprehensive, difficult to search effectively
- Google Scholar – fantastic tool for the money but patchy [see eg *Prof P Jasco*]
- WOS – JCR – great tool but not comprehensive
- Scopus? great tool but not comprehensive



Traditional Bibliographic Indexes

Examples:

AGRICOLA
ASFA
Avery
Biosis
Chemical Abstracts
Compendex
ESPM
GeoRef
IBSS
Inspec
Metadex
PubMed /Medline

Characteristics:

Specific **topic** /discipline
focus

Compiled by **Subject
Specialist Editors**

Selecting Relevant Titles
for Inclusion

Featuring **Controlled
Vocabulary**

Controlled Vocabulary
informs the **result order**
in simple search

The Value of A&I?

Very **comprehensive** literature reviews across their specific disciplines – A&I has greater **breadth, depth and scope**

International in scope and multilingual (with abstracts in English)

Content in A&I databases is not under **embargo**

Indexing standards applied to specialist content sets (such as controlled vocabulary) assist in retrieval of relevant resources

Faster A good abstract lets you digest the fundamentals of the paper without having to read the complete paper – “strategic reading”

Abstract & Citation Databases (SCI/JCR, SCOPUS)

CITATION DATABASES

Citation Index Features: MultiDisciplinary & Narrow Range of Publications

MultiDisciplinary

Narrow Range of Elite Publications



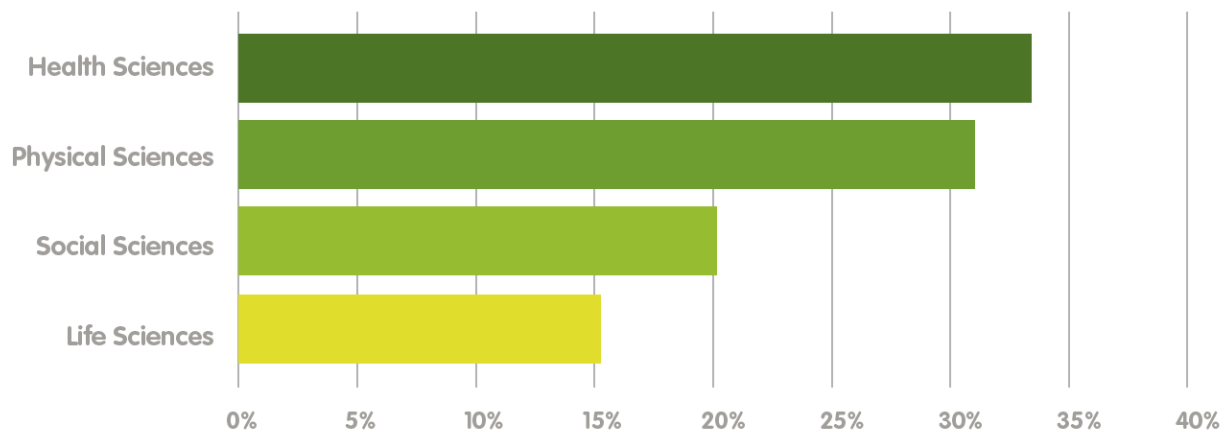
JCR (ThomsonReuters) Characteristics: MultiDisciplinary & Narrow Range of Publications

ThomsonReuters, Web of Science, JCR/SCI

There are approx 9500 journals included in JCR
6400 are in the Science Edition,
1800 in the Social Sciences and
1200 the Arts & Humanities



Scopus Content Features: Highly Selective Content Pool, possibly a wider range

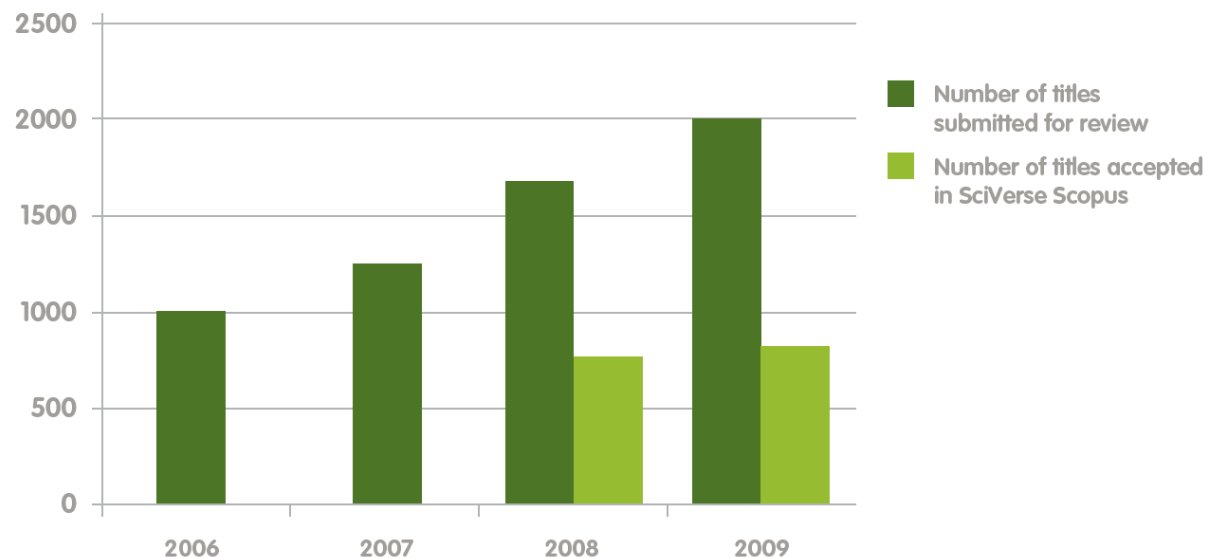


wide Topic Scope – Narrow Range of Entities

Citation Index Features: Elite Peer Review Focus

WOS – features a highly selective pool of elite peer reviewed titles (9500) journals included in the Journal Citation database

Scopus also highly Selective



The number of suggested titles can vary significantly per subject area from only a few titles (e.g. in chemistry) to several hundred (e.g. in social sciences).

Bradford's Law

WOS cite as justification limited resources and
Bradford's Law: ***“a relatively small number of journals publish the bulk of significant scientific results”***

An analysis of 7,621 journals covered in the 2008
JCR ® revealed that:

300 journals account for more than 50% of what is cited and
3,000 journals account for about 80% of published articles
and more than 90% of cited articles.

Matthew Effect

Matthew's Gospel (25:29)

“For unto every one that hath shall be given, and he shall have abundance: but from him that hath not shall be taken away even that which he hath”.

*“In scientific journals, and at scientific conferences, **new articles and papers by already-prestigious scientists usually receive far more attention than articles by scientists still on the way up, regardless of the intrinsic merit of such contributions**”**

* A Deductive Explanation of the Matthew Effect in Science – Jack Goldstone - *Social Studies of Science*, Vol. 9, No. 3. (1 August 1979), discussing Merton's theory of cumulative advantage in science

Bradford & Matthew – so what?

There is a risk that important research may be overlooked by only looking at the core elite of peer reviewed journals

The impact factor's Matthew effect: a natural experiment in bibliometrics

Vincent Larivière and Yves Gingras

Is finding highly cited research the way to uncover hidden research?

Journal of Cell Biology

“Show me the Data”

<http://jcb.rupress.org/content/179/6/1091.full>



“My question is: Are we making an impact?”

Bibliographic Indexes (eg ChemAbs, ProQuest Technology Research Database / GeoRef/ Metadex)

Narrow Topic Focus

Greater Depth of Coverage

Wider range of content types

Peer Reviewed Journals

**Wider set of Scholarly
Journals relevant to topic**

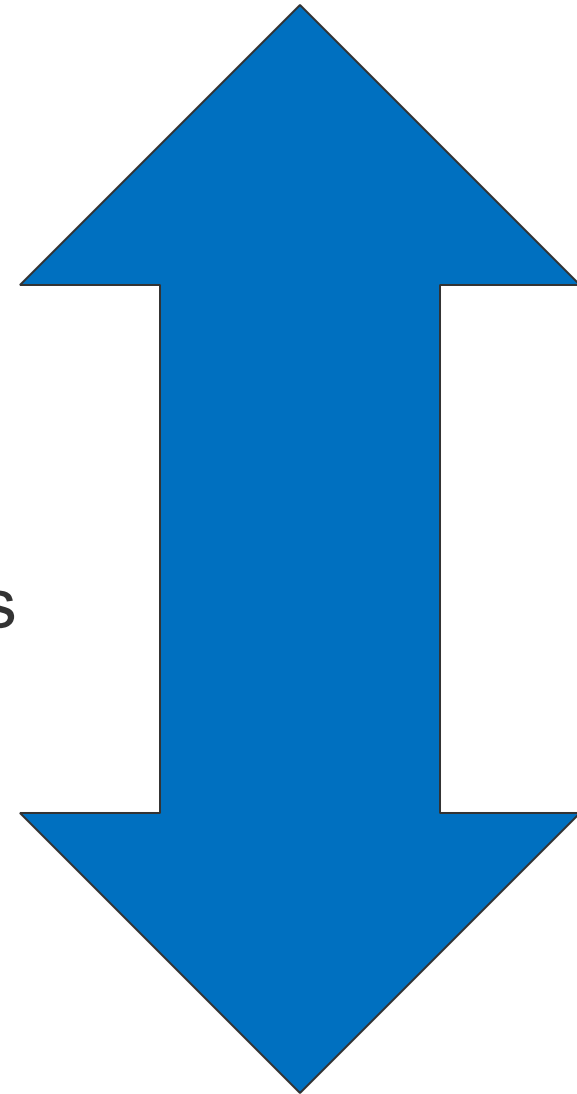
Conference Papers/Proceedings

Reports

Trade Journals

Monographs

Patents



Record Counts and Title Counts

Record Count	Web of Science	Scopus
1996-present	23.4M	22M
Pre-1996	25.9M	20M
TOTAL	49.3M	42M

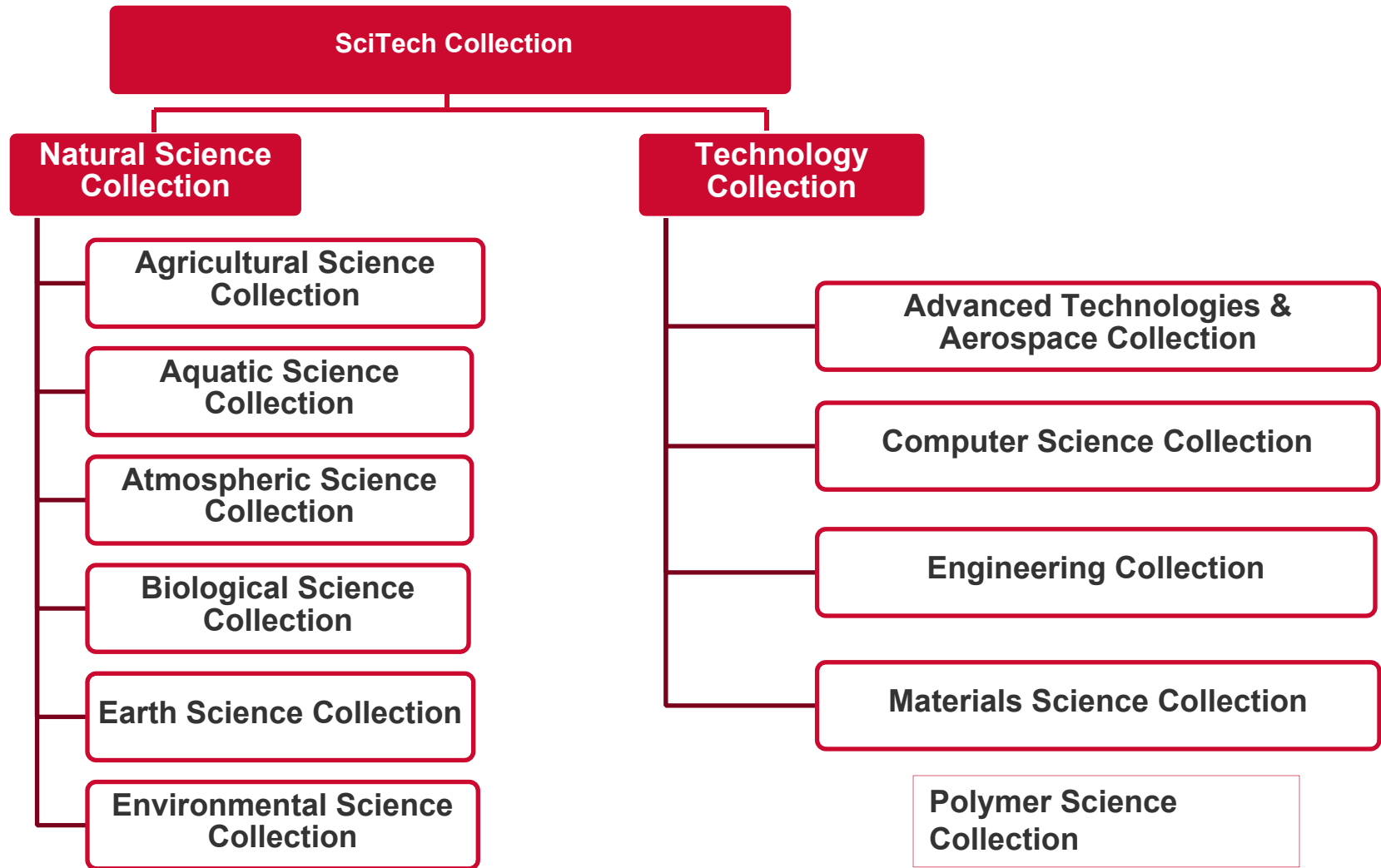
JCR/SCI/Scopus

- great for citations and impact
- useful for discovering connections in methodology etc in other fields due to being multidisciplinary

ProQuest SciTech Collection

- Total A&I Records: **76 million**
- Total Publications Monitored: 39,450
- Much Higher Content Counts within the specific disciplines
- Indexing covered

Science & Technology: Core Products



Natural Sciences

- AGRICOLA
- Aqualine
- ASFA: Aquatic Sciences and Fisheries Abstracts
- Biological Sciences
 - BioOne
 - Biotechnology and Bioengineering Abstracts
 - Biotechnology Research Abstracts
 - Conference Papers Index
 - Illustrata: Natural Sciences
 - EIS: Digests of Environmental Impact Statements
 - Environment Abstracts
 - Environmental Impact Statements: Full-Text & Digests
- Environmental Sciences & Pollution Management
 - GeoRef
 - GeoScienceWorld Millennium Collection
 - International Pharmaceutical Abstracts
 - MEDLINE
 - Meteorological & Geostrophysical Abstracts
 - NTIS
 - Oceanic Abstracts
 - Physical Education Index
 - Plant Science
 - ProQuest Deep Indexing: Agriculture
 - ProQuest Deep Indexing: Aquatic Sciences
 - ProQuest Deep Indexing: Atmospheric Sciences
 - ProQuest Deep Indexing: Biological Sciences
 - ProQuest Deep Indexing: Earth Sciences
 - ProQuest Deep Indexing: Environmental Sciences
 - Scopus Natural Sciences
 - TOXLINE
 - Water Resources Abstracts
 - Zoological Record Plus (1864-Current)

Technology

- Aerospace & High Technology Database
- ANTE: Abstracts in New Technologies and Engineering
- Aqualine
- Biotechnology and Bioengineering Abstracts
- Biotechnology Research Abstracts
- CSA / ASCE Civil Engineering Abstracts
- Illustrata: Technology
- CSA Technology Research Database
 - CSA Engineering Research Database
 - ANTE: Abstracts in New Technologies and Engineering
 - CSA / ASCE Civil Engineering Abstracts
 - Earthquake Engineering Abstracts
 - Environmental Engineering Abstracts
 - Mechanical & Transportation Engineering Abstracts
 - CSA High Technology Research Database with Aerospace
 - Aerospace & High Technology Database
 - Computer and Information Systems Abstracts
 - Electronics and Communications Abstracts
 - Solid State and Superconductivity Abstracts
 - CSA Materials Research Database with METADEX
 - Aluminium Industry Abstracts
 - Ceramic Abstracts/World Ceramics Abstracts
 - Copper Technical Reference Library
 - Corrosion Abstracts
 - Engineered Materials Abstracts
 - Materials Business File
 - METADEX
- Earthquake Engineering Abstracts
- LISA: Library and Information Science Abstracts
- Mechanical & Transportation Engineering Abstracts
- NTIS
- Polymer Library (formerly Rapra Abstracts)

A tough case for A&I?

“I need full text, I have a dwindling budget... do I need A&I databases?”

Are you serving patrons effectively by sacrificing their search capability?

Your researchers won't find

all the relevant content

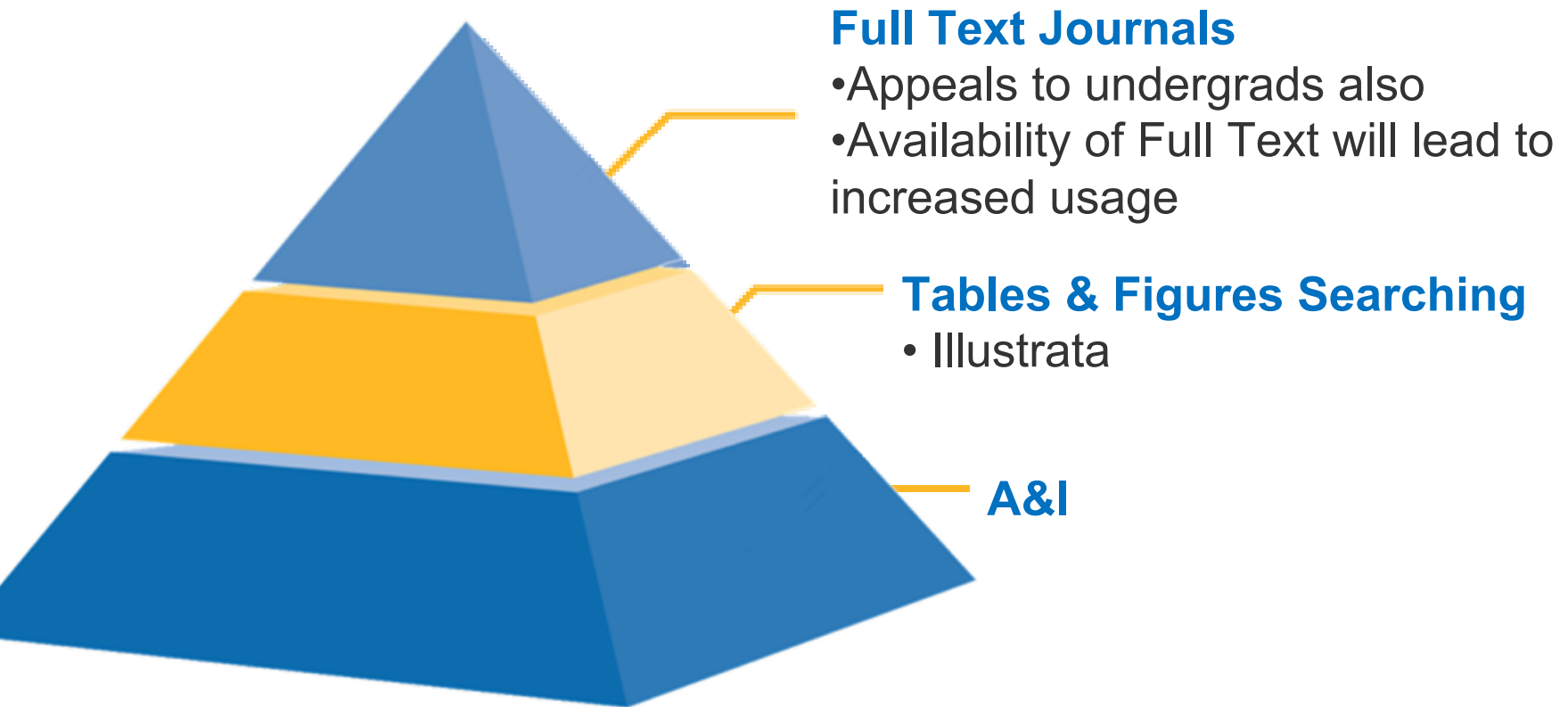
any of the relevant content, **quickly**



A&I +++ All the Benefits and More

BEYOND A&I - HYBRID

Hybrids: ProQuest's Science & Technology Collections



Full Text Collections: Remove the Uncertainty of Link Resolvers

Source type: Scholarly Journals

1



[Application of life cycle assessment in the mining industry](#)

Preview

Awuah-offei, Kwame; Adekpedjou, Journal of Life Cycle Assessment 16. 1 (Jan 2011): 82-8
...of life cycle assessment in the mining industry. Awuah-Offei & Akim
...the application of LCA in the mining industry. For example, a search
...but only 19 are related to the mining industry. Also, mining companies are
References (47)

Citation/Abstract Full text - PDF (205 KB)

PQ full text collection

Database: Geotitles

1



[Coal mining above a confined aquifer](#)

Preview

Wang, J A; Park, H D. International Journal of Rock Mechanics and Mining Sciences (1997) 40. 4 (June 2003): 537-551
...Mining above a confined aquifer involves
...mining face through broken floor strata. Thus, safe mining should take into

Citation/Abstract LINK to Full Text

Indexing (Details) [Cite this](#)

Subjects

Air speed, Autonomous mini aerial vehicle M2AV system, Geodetic coordinate system, Pitch angle (°)

Caption

The three coordinate systems used to transform the true airspeed into the geodetic coordinate system. The indices a, b, and g represent, respectively, the aerodynamic, body, and geodetic coordinate systems. Alpha is the angle of attack α , beta the sideslip angle β , yaw the true heading [imgchar=<http://ams.allenpress.com/charent/greek/unaccented/cap/psi.gif>], and pitch the pitch angle θ . Illustration, Figure

Image Category

Title

Measuring the Wind Vector Using the Autonomous Mini Aerial Vehicle M2AV

Publication title

[Journal of Atmospheric and Oceanic Technology](#)

Volume

25

Pages

1969-1982

Number of pages

14

Publication Date

Nov 2008

Publication year

2008

Year

2008

Journal Subjects

[Meteorology](#)

ISSN

0739-0572

Source type

Scholarly Journals

Peer Reviewed

Yes

Language of Publication

English

Document Type

Indexed Image

DOI

10.1605/01.301-0004594117.2009

Accession Number

301-0004594117

ProQuest Document ID

297044091

Document URL

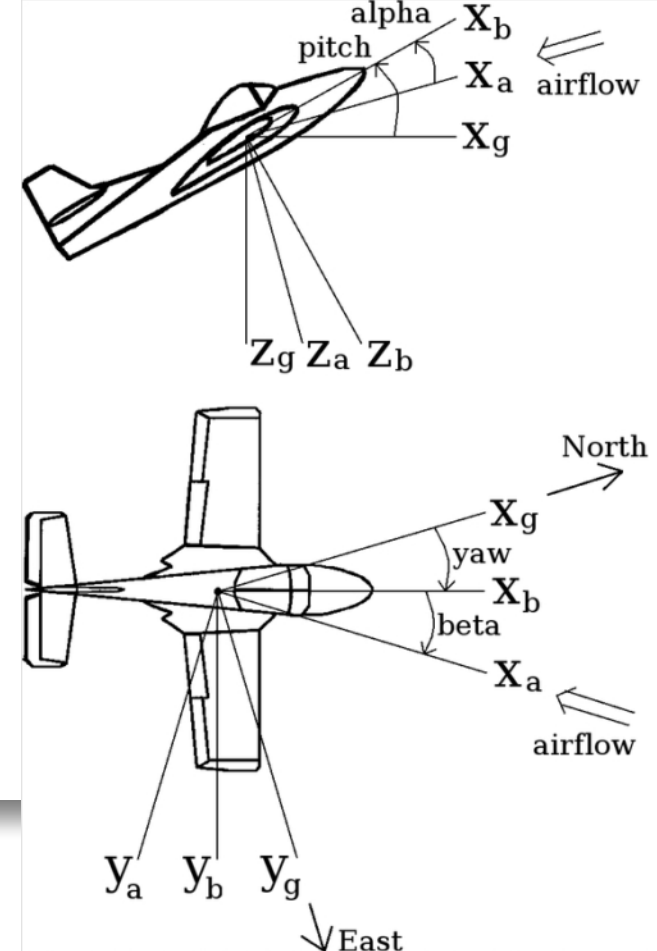
<http://search.proquest.com/docview/297044091?accountid=131239>

Last Updated

2010-11-26

Database

2 databases [View](#)



van den Kroonenberg, A., Martin, T., Buschmann, M., Bange, J., & Voersmann, P. (2008). Measuring the Wind Vector Using the Autonomous Mini Aerial Vehicle M2AV [Figure . 3]. *Journal of Atmospheric and Oceanic Technology*, 25, 1969-1982. Publisher: American Meteorological Society

Recent Abstract & Indexing Innovation

ILLUSTRATA & DEEP INDEXING

Illustrata Deep Indexing – precision searching power

Features: Is the Greenland Ice Sheet in a state of collapse?

Christoffersen, Poul; Hambrey, Michael J. *Geology Today* 22. 3 (May 2006): 98-103.

[Show duplicate items from other databases](#)

Abstract (summary) [Translate](#)

The Greenland Ice Sheet is thinning at an accelerating pace and the ice sheet's contribution to sea-level rise has doubled in less than a decade. New data show rapid ice sheet, particularly along the coastal margin. These changes are associated with a warming of up to 3 degree C. Decay of the Greenland Ice Sheet is driven by increased surface melting during longer and warmer summers that drain the interior ice sheet. A precise estimate of sea-level rise requires an improved theoretical treatment of these glaciers in computer models.

Figures and tables [Hide figures and tables.](#)

Document includes 7 figures.

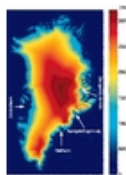
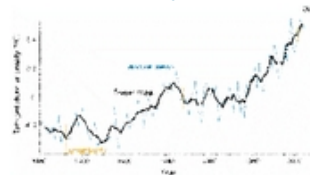


Figure 1.



Figure 2.



[Figure 3.](#)

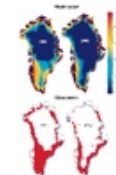


Figure 4.

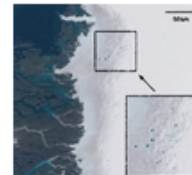


Figure 5.

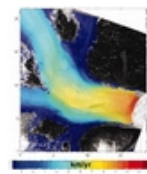


Figure 6.



Figure 7.

Figure 3.

Caption: The Goddard Institute for Space Studies temperature analysis 1880–2005 showing increase in global surface temperature relative to the 1951–1980 mean (J. Hansen, NASA, <http://data.giss.nasa.gov/gistemp/2005/>).

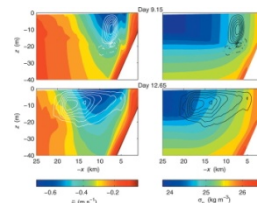
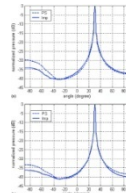
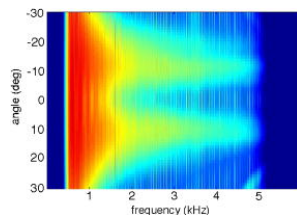
Type: Time Series Plot ; Graph ; Line Graph ; Figure

Subject Terms: Increase in global surface temperature ; Temperature anomaly ([degrees]C) ; Time (yr)

If A&I is so good, why do we need Illustrata Deep Indexing?

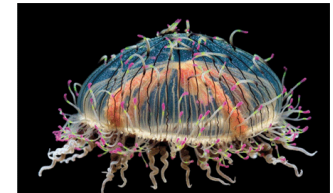
Rationale: figures and tables represent the distilled essence of research. By indexing data presentations, researchers can:

1. Search for images/graphs/ tables
2. Perform **highly-focused searches**, quickly
3. Find information that is otherwise hidden
4. Respond to the **growing need for data**



Geographic Origin	Number of polymorphic loci (%)
Planaltina, Goiás	92 (51.69)
Platina, São Paulo	92 (51.69)
Sertãozinho, Paraná	79 (44.38)
Cambé, Paraná	90 (50.56)
Curitiba, Paraná	75 (42.13)
Warta, Paraná	82 (46.07)
Palmital, Paraná	69 (38.76)
Chapeco, Santa Catarina	103 (57.87)
Passo Fundo, Rio Grande do Sul	81 (45.51)
Cruz Alta, Rio Grande do Sul	112 (62.69)
Entire population	178 (100.00)

Nei's (1973) gene diversity



Why hasn't anyone gone to the effort before?

- ProQuest technology team overcame many hurdles
- Indexing at the sub article level increases the workload by an order of magnitude
- Awarded a patent for their efforts

(12) United States Patent		(10) Patent No.:	US 8,024,364 B2	
Dunie et al.		(45) Date of Patent:	Sep. 20, 2011	
(54) METHOD AND SYSTEM TO SEARCH OBJECTS IN PUBLISHED LITERATURE FOR INFORMATION DISCOVERY TASKS		FOREIGN PATENT DOCUMENTS		
		JP	04-097248 A	3/1992
		JP	05-012350 A	1/1993
		JP	09-006777 A	1/1997
(75)	Inventors: Matthew Dunie , Great Falls, VA (US); Craig W. Emerson , Lothian, MD (US)	JP	09-223240 A	8/1997
		JP	10-228473 A	8/1998
		JP	11-154157 A	6/1999
(73)	Assignee: Proquest LLC , Ann Arbor, MI (US)	JP	2000-194690 A	7/2000
		JP	2003-248690 A	9/2003
		JP	2004-086307 A	3/2004
(*)	Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35	JP	2005-519395 A	6/2005
		JP	2006-031660 A	2/2006

How Does Subject Specific A&I fit with next generation Discovery Tools?

SUMMON

How does Summon fit into the picture?



Summon™

offers a compelling starting place for users on the library web site

offers Google-like searching and response time

makes the full breadth of a library's content discoverable

displays results in a content-neutral way

Library's "digital front door".

The focus is at the **surface**



Differences between Summon & A&I search experience

Each discipline-specific database is crafted to match the needs of the expert researcher

A&I databases better at filtering extraneous results from full text searching

Command-Line Search

“Suggested Subjects” which provide relevant topics for further searching are only available through the A&I search interface.

Deep Indexing – Illustrata – only available on A&I

Drives database usage by enhancing their visibility



Recommendation: We found a specialized

Sociological Abstracts

Over 1,800 serials publications, as well as
conference



Recommendation: We found a specialized

ASFA: Aquatic Sciences and Fisheries Abstracts

5,000+ serial publications, books, reports, and
pollution



Recommendation: We found a specialized collection

Materials Research Database

3,000+ periodicals, conference proceedings, technical
books, and press releases covering materials science
used in engineering applications

Are we getting the message out?

INFORMATION LITERACY

Surveys & Reports on Research

Research Information Network

Patterns of Information Use and Exchange Across Disciplines

(Presentation From Fiesole Collection Devt Retreat)

Reinventing Research – Information Practices in the Humanities

Case Studies of Researchers in the Life Sciences (In conjunction with British Library)

OCLC/JISC/RIN – The Digital Information Seeker (key insights from 12 separate user studies)

OCLC - Scholarly Information Practices in the Online Environment

Ithaka

Faculty Survey

Discipline Reports

Education

Economics

History

Biosciences

Chemistry with JISC

History with NEH

CIBER/UCL/Emerald - Social Media and Research Workflow

Case Studies on Life Sciences Researchers Findings

Google...the ultimate enabler. Researchers aware of Google's limitations but seem unconcerned that it yields a partial and potentially unmediated set of results.

Heavy use of services such as PubMed which serve specific domains and are perceived as comprehensive and authoritative.

Limited awareness of the range of information services and resources available to them, and the number that they report using seems surprisingly small.

Seek advice from colleagues (life scientists more than information professionals)

Researchers see informal and local exchange of information [complementing] more formal mechanisms for information exchange, conferences, reports to funders, scientific publication).


Library Resources Metadata

Researchers' use of academic libraries, 2007

- Need to provide good metadata
- Many resources under-used because inadequately catalogued

Online catalogs, 2009

- Differences exist between the catalogue data quality priorities of users and librarians



Search the catalogue and most of our e-journals together

[Summon Advanced Search](#)
[Summon Help](#)

Title	Code
A Select Guide to Patent and Trademark Information: Internet Sources	A W F
Acronym Finder	A W F
Australian Digital Theses Database	A W F
BioEngineering abstracts	A W
Biotechnology and Bioengineering Abstracts	A W
British Standards Online	A W
CALgroup modules	A
Caltech Collection of Open Digital Archives	A W F
Canadian Patents Database	A W F
CivilENGINEERINGnetBASE	A W
Compendex (Engineering Village 2)	A W
Compendex Plus (see latest update in Compendex)	A
Conference Proceedings citation index. Science	A W
Conference Proceedings citation index. Social Sciences & Humanities	A W
CSA Illumina	A
DEPATISnet	A W F
EEVL Ejournal Search Engine	A W F
Encyclopedia of Material Tensors	A
Engineering Village 2	A W
ENGnetBASE	A W
Environmental engineering dictionary and directory	A
Ergonomics Abstracts Online	A W
Esp@cenet	A W F
ESPACE Access: European and PCT International Patent Application Bibliography	A
ESPACE Aseanpat	A
ESPACE Bulletin: European Patent Bulletin Information	A
ESPACE EPA: European Patent Application	A
Essential Science Indicators	A W G L
Expanded Academic ASAP Int'l Ed	A W L
FreePatentsOnline	A W F
GeneralENGINEERINGnetBase	A W
Google Books	A F W
GrayLIT Network: a Science Portal of Technical Reports	A W F
Handbook of Comparative World Steel Standards, 2nd Ed.	A
Hong Kong University Theses Online	A W F
IEC Standards [Connect to database via Central Library Reception Desk]	A
Index to Theses with Abstracts accepted for Higher Degrees by the Universities of Great Britain and Ireland	A W
Intellectual Property Digital Library	A W F
International Standards Organization (ISO) (Catalogue only)	A W F
Internetstats.com	A W F
Intute: Science and Technology	A B W F
IP Australia Patsearch	A F
ISI Essential Science Indicators	A W G L
ISI Proceedings	A W G L
ISTP on CD ROM	A
Journal Citation Reports on CD ROM: Science Edition	A
Journal Citation Reports on the Web (JCR)	A W G L
Kinokuniya BookWeb Pro	A W G

User Confidence – High!

Table 13: Finding: User Confidence

Study	Finding
Perceptions of libraries, 2005	<ul style="list-style-type: none">– Respondents are satisfied with their search; tend to trust results the same as results from libraries– In determining quality, users judge based upon their own knowledge or common sense
College students' perceptions, 2006	<ul style="list-style-type: none">– Students are satisfied with their search– In determining quality, users judge based upon their own knowledge or common sense
Sense-making, 2006	Users are adept at doing searches for personal needs
Researchers and discovery services, 2006	Researchers are self-taught but remain confident in their own skills
Researcher of the future, 2008	Big gap between performance and self-estimates
Seeking synchronicity, 2008	<ul style="list-style-type: none">– Getting an answer was cited most often for success– A mixture of relational and content facilitators contributing to perceptions of success

From:
The Digital Information Seeker

Report of findings from selected OCLC, RIN and JISC user behaviour projects

However, it seems that information literacy has not necessarily improved with users' digital literacy (see Table 14).

Information Literacy – Low!

Table 14: Finding: Information Literacy

Study	Finding
Perceptions of libraries, 2005 College students' perceptions, 2006	<ul style="list-style-type: none">– In determining quality, users judge based upon their own knowledge or common sense, institutional reputation, cross-checking, and recommendations– Cross-checking most often involves other websites
Sense-making, 2006	Participants acknowledge the value of databases and other online sources
Researchers and discovery services, 2006	Most common search strategy is refining down from a large list of results
Researchers' use of academic libraries, 2007	Researchers' awareness of OA issues is low
Researcher of the future, 2008	<ul style="list-style-type: none">– They are <i>not</i> expert searchers– Tend to spend little time, little effectiveness in evaluating search results; prefer natural-language searching and trust Google; do not find library resources intuitive– Teachers not passing literacy on to the pupils– A big gap between their performance and their self-estimates
E-journals, 2009	Shorter sessions, using basic search, and viewing fewer pages
Students' use of research content, 2009	<ul style="list-style-type: none">– Users assess content based on its relevance to their assignment– Students are aware of difference between formal research and basic internet content
User behaviour in resource discovery, 2009	<ul style="list-style-type: none">– Information literacy skills are lacking; they have not kept pace with digital literacy– When level of information literacy and domain knowledge increases, increased use of quality resources

From:

The Digital Information Seeker

Report of findings from selected OCLC, RIN and JISC user behaviour projects

One important finding related to this is that **high-quality metadata** is becoming even more important for discovery of appropriate resources (see Table 15).

Collaboration & Communication

Key external factors (mostly funding) driving need for continued expansion of academic collaboration

Academic collaboration often involves email and does not fully leverage latest technologies and tools

Sciences more advanced in collaboration than the humanities (Long tradition of multi-author articles in life sciences and physics)

Universities are doing more to communicate to organisations, corporations and public to show relevance of research



COLLABORATION

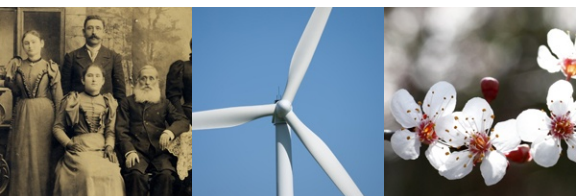
Royal Society Survey: Collaboration can lead to a 3 x Increase in Impact

Figure 2.8. Those countries (country y) in 2008 which achieved a three-fold increase on their standard domestic publication impact, through collaboration with 'country x'. Minimum of 1,000 papers published by each country in 2008.¹⁹⁶

[illegible]

Let's Collaborate: How can publishers help?

- Tell us what you're hearing for your users
- Let us know how we can help you to communicate info on resources
- Tell us what you need so we can build it



Landmarks in Research Tools

Evolution of Indexing

19th Century: Information Landmarks

Professional Librarianship developed in the mid C19th

Classification systems such as Library of Congress & Dewey Decimal System developed to promote consistency

Toward end of C19th many professional journals emerged within subject domains: physics, chemistry, geology, philosophy etc

Indexing & Abstracting started to enhance discovery for researchers within subject domains



Mid C19th Late C19th

LC & Specialised
Dewey Journals



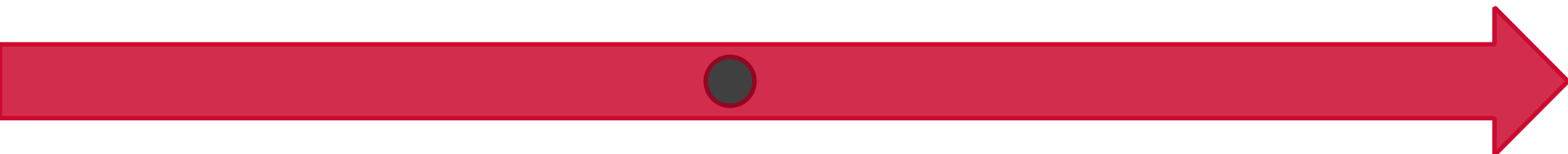
Early 20th : Chem Abs

Dedicated A&I service for Chemistry



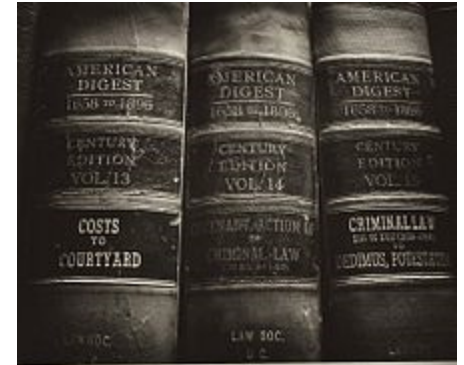
1907

Chem Abs



Early 20th Century and the Law

Legal Publishing:



In 1909 John B. West complained: *“No one who has to do with the profession in connection with the purchase or use of books, can fail to notice the continual complaint of increasing cost, of lack of shelf room, of confusing citations and other complications arising from multiplicity of reports.”*

The solution ... from the *Frank Shepard Company*: **Shepard's Citations** is a [citor](#), a list of all the authorities citing a particular case, statute, or other legal authority.

Early C20th
Shepards



Science Citation Index

Conceived after a suggestion to use Shepards as a model for a system to prevent “man drowning in a sea of information”

ISI (now Thomson Reuters)
Web of Science – “probably the most influential search engines in existence”



Eugene Garfield – founder of SCI & ISI

1960
SCI

2002
WoK



60s: traditional bibliographic databases go electronic



The seminal electronic online search engine 1966

1966
Dialog



70s: traditional bibliographic databases go electronic

OCLC formed in 1967 – later to produce WorldCat
1971 Alden Library at Ohio University became the first library in the world to do online cataloguing

1967
OCLCe



SCI to PageRank to Google

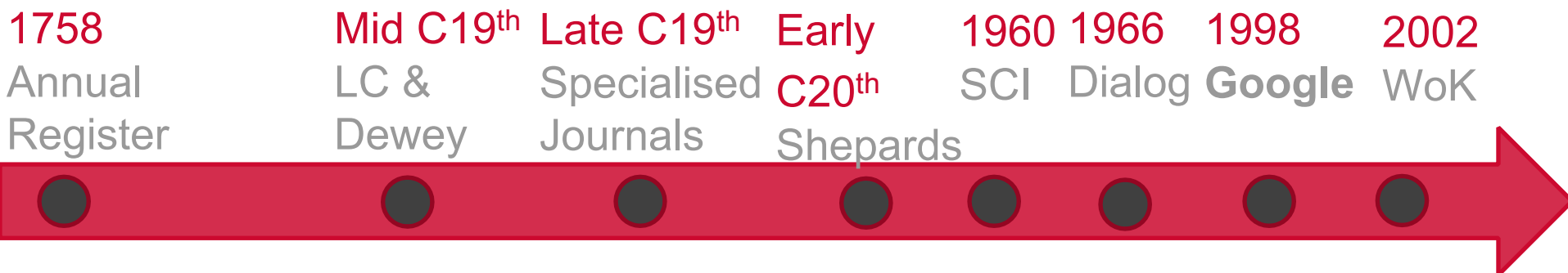
SCI inspired

...a method developed by Pinski and Narin in 1976

... which was a major influence for Brin & Page's
PageRank link analysis algorithm

PageRank became the heart of the Google search engine.

Google Scholar: released Nov 2004 in beta



2000s: Discovery

Discover Layer:

WorldCat Local,
Summon,
Primo Central,
Ebsco Discovery Service

2000s
Discovery
Layer



2000s: IRs: From Outside In to Inside Out

Information Repositories

Inside Out – making the University's intellectual output available to the outside world

2000s
Discovery
Layer



Impact from SCI

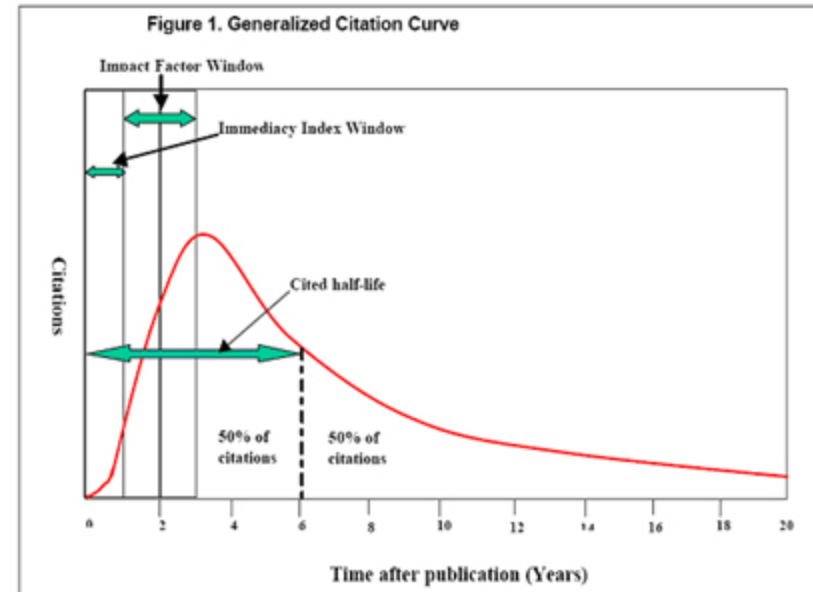
Impact Factors for journals

H Index (academics)

Eigen Factor

Article Influence

Competing resources such
as SciVerse Scopus



IMPACT FACTORS: USE AND ABUSE
M. Amin & M. Mabe, *Elsevier*