Citation Indexing : An Overview

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Outline of the Presentation

- Concept of Citations
- Citation Indexing
- Web of Science databases
- Limitations of WoS Databases
- Indian Citation Index (ICI)
- Why We Need ICI?
- Benefits of ICI

- The Impact Factor
- Tools for measuring Impact Analysis
  - JCR (Journal Citation Report)
  - Other tools for Measuring the Impact analysis
- Example of Google Scholar and Scholarometer

Concept of Citations

citations symbolize the conceptual association of scientific ideas as recognized by publishing research authors .

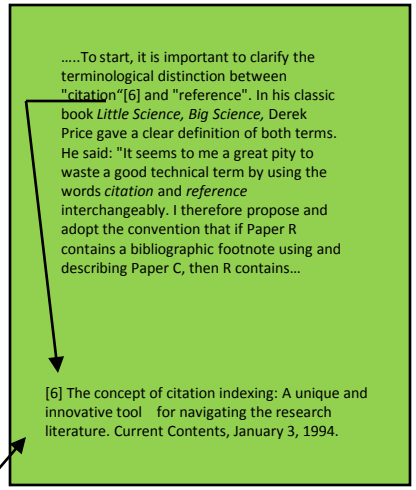
By the references they cite in their papers, authors make explicit **linkages** between their current research and prior work in the archive of scientific literature.

distinction between "citation" and "reference"

- If Paper R contains a bibliographic footnote using and describing Paper C, then
  - R contains a *reference* to C,
  - C has a *citation* from R.
- The number of references a paper has is measured by the number of items in its bibliography as endnotes, footnotes, etc.,
- The number of citations a paper has is found by looking it up [in a] ***citation index*** and seeing how many others papers mention it."

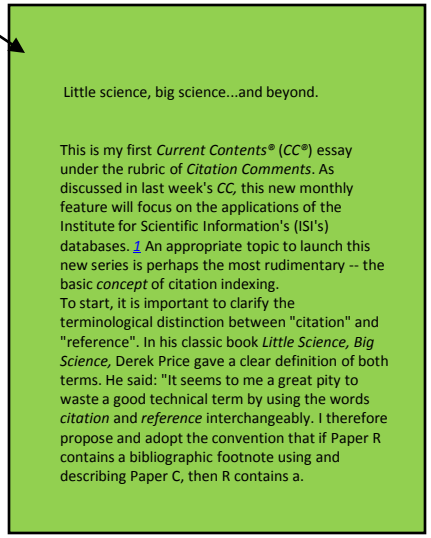
Source: Price D. J. D. Little science, big science. and beyond. New York: Columbia University Press, 1986.

Paper R



R contains a ***reference to*** C,

Paper C



C has a ***citation from*** R.

adopted from : Mathew, N. (n.d.). Citation indexing. Retrieved from http://ist.psu.edu/faculty_pages/giles/IST497/presentations/Mathew.ppt

Citation Indexing

- Introduced by Dr. Eugene Garfield of Institute of Scientific Information (Web of Science) in 1950s.

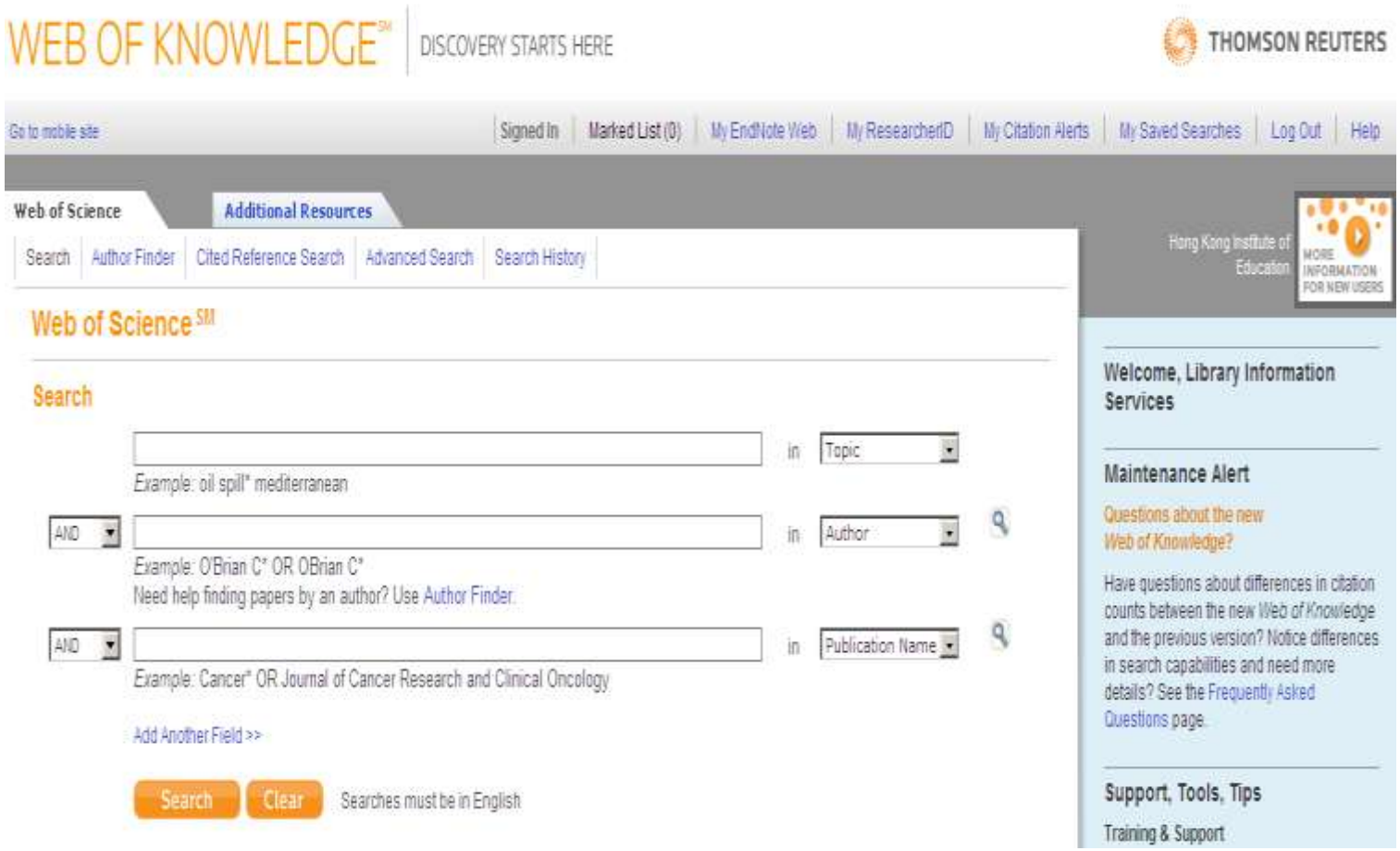
- Citation indexing makes links between books and articles that were written in the past and articles that make reference to ("cite") these older publications. In other words, it is a technique that allows us to trace the use of an idea (an earlier document) **forward** to others who have used ("cited") it.

- The citation indexes were originally designed primarily for information retrieval. Helps for identifying the relevant research papers independent of language, title words, or author keywords

ISI Web of Science Databases

- Science Citation Index Expanded(SCI)
- Social Science Citation Index (SSCI)
- Arts and Humanities Citation Index (A&HCI)

WoS Search Interface



Advantages of Citation Indexing

- SCI, SSCI and A&HCI are multidisciplinary in nature..
- The citation-based associations and connections within the literature are made by authors themselves.
- Helps for identifying the core periodicals in a subject.
- Helps for quantifying or measuring the research productivity of an institution or individual or country or region.

Limitations of WoS Databases

- Majority of the journals are from US.
- Less presence of journals published from third world countries.
- Only index journals not monographs
- Non-English language journals are not as comprehensively indexed (Mathew, n.d.)

Indian Citation Index

Why We Need Indian Citation Index?

Coverage of Web of Science

Citation Index	No of Journals
Science Citation Index	3772
Social Science Citation Index	2995
Arts & Humanities Citation Index	1656

Total =8423 Journal
30.30 of the World Publications
24000 Peer Reviewed Journals (Sale, 2007)
Only 268 Indian Journals are indexed in WoS

Indian Citation Index Web Interface

http://www.indiancitationindex.com

Benefits of ICI

- A comprehensive research & evaluation tool for Indian literature
- Facilitates comprehensive scientometric and bibliometric studies on Indian literature
- Helps to measure & analyze individual, institutional, regional, and national R&D output for strategic planning
- An authentic tool to generate complete and comprehensive analytic reports on the health of Indian R&D
- ICI can generate national R&D indicators like, Indian Journals Citation Reports, etc.
- Catalyze the image & visibility of Indian knowledge contents and publications
- Helps decision makers to arrive at some conclusive point to decide the superiority of competitor (s), for some awards, fellowships, recruitments etc.
- Provides a boost to Indian publishing industry at global level

Products of ICI

- Indian Science Citation Index (ISCI)
- Indian Health Science Citation Index (IHSCI)
- Indian Agriculture Citation Index (IACI) India
- Social Science & Humanities Citation Index (ISSHCI)
- Indian Journals Citation Report (IJCR)
- Indian Science & Technology Abstracts (ISTA)
- Directory of Indian R&D Journals (DoIJ)

Search Interface of ICI

Search Strategies

- **What are the criteria for adding new journals to ICI?**

ICI works with its basic intent to cover all scholarly journals from India irrespective of their discipline (s) subject to content selection criteria

Indexing Research Materials

- Research articles
- Review articles
- Short or brief communications
- Editorial and letter to editor
- Research notes
- Case studies
- Case reports
- Opinion papers
- Observations

The Impact Factor

- The impact factor is a measure of the frequency with which the average article in a journal has been cited in a particular year or period.

- JCR (Journal Citation Report) of WoS has been major tool for measuring the Impact factor of journals.

JCR Impact Factor

- The *JCR* provides quantitative tools for ranking, evaluating, categorizing, and comparing journals (Thomson Reuters, 2011).

- JCR impact factor is a ratio between citations and recent citable items published.
- Thus, the impact factor of a journal is calculated by dividing the number of current year citations to the source items published in that journal during the previous two years

Calculation for journal impact factor

A= 2010 cites to articles published in 2008 and 2009

B= Number of articles published in 2008 and 2009

C= A/B= 2010 Impact factor

	A Cites in 2010 to 2008-2009 articles	B Number of articles Published in 2008 and 2009	C Impact Factor (A/B)
Journal of Library and Information Science	150	80	1.875

Reproductive Systems category of the 1992 *SCI® Journal Citation Reports®* (*JCR®*)

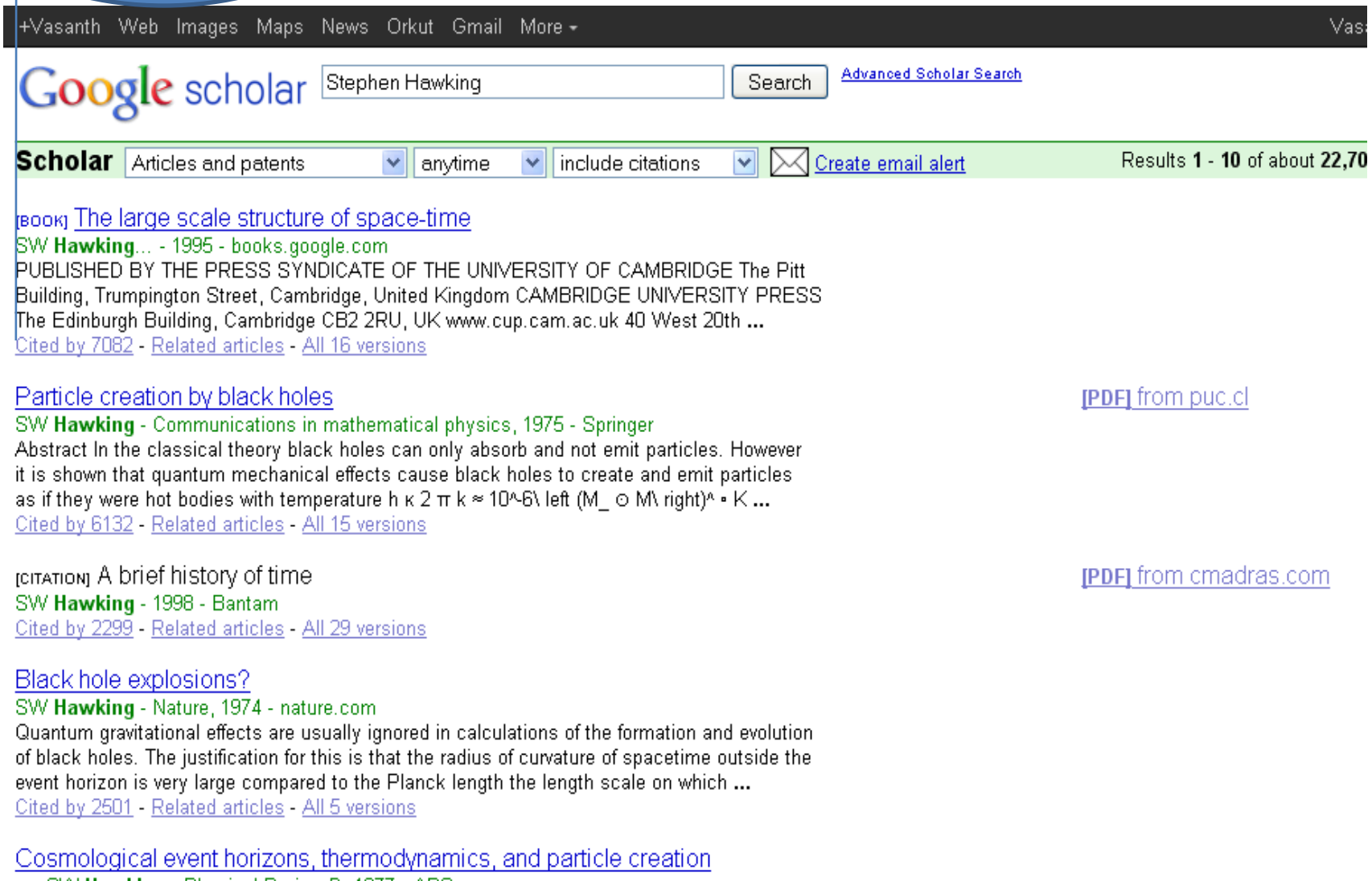
Reproductive Systems Journals	(A/D) JCR Impact Factor	A Cites in 1992 to 1990-91 Articles	B Self-cites in 1992 to 1990-91 Articles	C (A-B) Minus Self-Cites	D Articles Published 1990-91	E (C/D) Revised Impact Factor
AM J REPROD IMMUNOL	1.931	224	54	170	116	1.466
ANIM REPROD SCI	0.701	110	23	87	157	0.554
BIOL REPROD	3.257	726	265	461	530	2.757

Table : Calculation of impact factors without self-citations

Free Citation Indexing Tool

Cited documents 7082 For the Article "The Large Scale.. By Hawking S.

Free Citation Indexing Tool

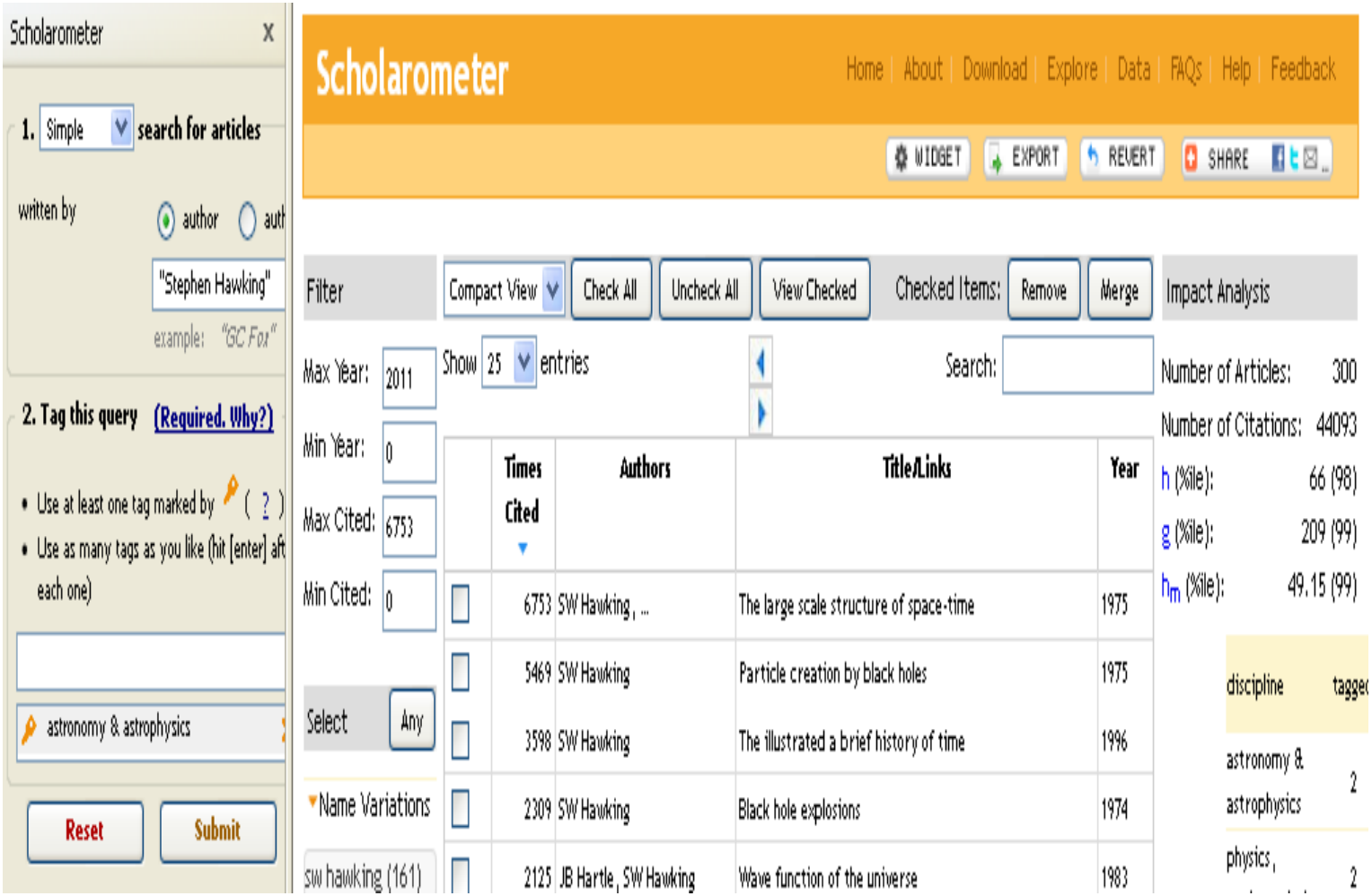


How do we measure Impact Analysis of Individual/ Institutions

Name of the Software	Features	Web address
Bibexcel	• Freely available • Uses SCI, SSCI as underlying data • Support for visualization	http://www8.umu.se/inforsk/Bibexcel/
Network Workbench	• Freely available • Support of larger scale network analysis (Wikipedia) • Used very much in Biomedical, Social Science and Physics Research	http://nwb.cns.iu.edu/index.html
Pajek	• Freely available • Support for larger scale network analysis and visualization	http://pajek.imfm.si/doku.php?id=pajek
Publish or Perish	• Freely available • Uses Google Scholar as underlying data • Support for citation analysis (author impact analysis, journal impact analysis etc)	http://www.harzing.com
Scholarometer	• Freely available • A browser add-ons • Uses Google Scholar as underlying data • Support citation analysis (Author impact analysis)	http://scholarometer.indiana.edu/

Scholarometer
http://scholarometer.indiana.edu/

Results for Stephen Hawking in Scholarometer



h-Index for Stephen Hawking Obtained through Scholarometer

Impact Analysis	
Number of Articles:	300
Number of Citations:	44093
h (%ile):	66 (98)
g (%ile):	209 (99)
h_m (%ile):	49.15 (99)

Thank You