

CITATION INDEXES AND OTHER PRODUCTS OF ISI

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Elaborates the philosophy behind citation indexing and lists the advantages of citation indexes over conventional subject indexes. Introduces the various citation indexes, the Web of Science and other related products developed by Institute for Scientific Information (ISI), Philadelphia, USA. Indicates the scope, coverage, different features, and advantages of these products. Besides citation indexes, other products discussed are Specialty Citation Indexes, Journal Citation Reports and Essential Science Indicators.

INTRODUCTION

The concept of citation indexes is simple. Many of the papers, notes, reviews, corrections, and correspondence published in the journal literature contain citations. These cite - generally by author, title, and where/when published - documents that support, provide a precedent for, illustrate, or elaborate what the author has to say. Citations are thus the formal, explicit linkages between their current research and prior work stored in the vast archive of the scientific literature. Citations symbolize the concepts or scientific ideas that authors discuss. These conceptual associations by citation have been described by Robert K. Merton, Manfred Kochen, and other scholars as intellectual transactions, formal acknowledgment of "intellectual debt" to earlier authors. Explicit references imply that an author has found a particular published theory, method, or datum useful in some way. Citation-based databases index these intellectual transactions or linkages by tagging and listing both the cited and citing works. These reference-citation pairs can be described in many ways. The cited work (reference) is a paper or book that has been mentioned in the bibliography or footnotes of a citing work (source). The source work contains

the cited references. Citation indexes were designed to facilitate information retrieval and dissemination using these source-reference connections.

As a result, the citation databases will help in navigating the literature in unique ways. The scholars will be able to locate related papers independent of language, nomenclature, title words or author keywords. Citation-based search strategies will include simple cited-reference searches that are linking of related papers, through shared references.

Citation indexes have a number of important benefits when compared with standard abstracts and indexes. Firstly, by their very nature, they do not rely on a subject classification approach, thus overcoming the semantic problem associated with this approach. Secondly, they will often provide a time-extensive profile of the relevant literature. Standard abstracts/indexes, on the other hand, typically operate within a limited time frame/issue-three month/s a year for example. Thirdly, they bring together all relevant works in a subject area (relevant to the author in question, that is), even though it may not fall within one subject area; this is unlike the standard abstract/index, in which some relevant work is likely to appear under other, sometimes unrelated, headings. Finally, they cross trans-disciplinary boundaries, unlike standard abstracts/indexes. But, on the other hand, citation indexes are expensive to produce and they assume that authors of papers are consistent and knowledgeable in their citations, which is not always so.

Shepards Citations Index is the oldest major citation index in existence. It was started in 1873 to provide the legal profession with a tool for searching legal decisions. Theoretical considerations associated with the concept of citation indexes were addressed in a paper published by Eugene Garfield in *Science* in 1955. Quite elaborate citation indexes were developed during the late 1950s and early 1960s, by the newly- established *Institute for Scientific Information (ISI)* (<http://www.isinet.com/welcome.html>). Formal realization of the concept came with the compilation of *Genetics Citation Index* in 1961, as a pilot study. *Science Citation Index* was first published in 1964, followed by the publication of other citation indexes also. Apart from the ISI publications, the only other enduring citation index was *Shepard Law Review Citations*, which was first published in 1968.

ISI CITATION INDEXES

The *Institute for Scientific Information (ISI)* located in Philadelphia, USA was founded in 1958 by Dr Eugene Garfield by borrowing \$500 from Household Finance. It initiated its activities by starting an information service, namely *Current Contents of Chemical, Pharmaco-Medical & Life Sciences* covering 200 journals and about 32 pages per issue. In 1961, ISI received a grant from the *National Institute of Health, USA* that resulted in preparation of a experimental *Genetics Citation Index*. In 1961, it also produced *Science Citation Index* covering 613 journals and 1.4 million citations. On the occasion of its 40th anniversary in 1998, ISI employed 800 people with offices in 7 countries. It now indexes more than 8000 journals in 35 languages. Thomson Business Information, a subsidiary of Thomas Corporation acquired ISI in 1992.

The ISI has developed a number of information products over the years, including the *Current Contents (CC)* range, the *Science Citation Index (SCI)*, and related products, *Current Abstracts of Chemistry and Index Chemicus (CAC & IC)* and many others. It maintains three core citation indexes: (i) *Arts & Humanities*

Citation Index, which cover major journals in all areas of the arts and humanities; (ii) *Science Citation Index: Expanded*, which covers major journals in the basic and applied sciences, including medicine, engineering, mathematics and computer science; (iii) *Social Science Citation Index*, which covers major journals in the social and behavioral sciences, including management, law and economics. Additionally, ISI publishes the *Web of Science*, which allows researchers to search one or multiple citation indexes from past to present and a number of specialized citation indexes. It also produces a number of other products which are briefly described below.

SCIENCE CITATION INDEX (SCI)

The *Science Citation Index (SCI)* provides access to current and retrospective bibliographic information; author abstracts, and cited references found in leading scholarly science and technical journals covering more than 100 disciplines.

Its key advantages and capabilities include: (i) allowing researchers to conduct broad-based comprehensive searches that uncover all the relevant information they need; (ii) provide cited reference searching, the unique ISI search and retrieval feature that lets users track the literature forward, backward, and through the database, breaking through disciplinary and geographical boundaries; and (iii) enables users to conduct multidisciplinary searches to discover hidden subject relationships.

The printed version of SCI provides access to current and retrospective bibliographical information and cited references found in 3700 of the world's leading scholarly science and technical journals. In addition to journals, it also covers some books and conference proceedings. It began publication in 1964 and subsequently retrospective sets covering 1950-54 and 1955-64 have been added. For inclusion in SCI, the journals are selected based on their citation statistics; specifically their "Impact Factor". Only journals with impact factors above a certain level, varying with the journal field, are indexed.

Components of Printed SCI

It consists of following components: (i) *Source Index*, (ii) *Citation Index*, and (iii) *Permuterm Subject Index*.

The Source Index

The *Source Index* provides full bibliographical record for the documents indexed in SCI - the other parts or indexes of SCI refer back to *Source Index* for complete record identification or information. The bibliographical record or entry in SCI includes the names of first and joint authors, the full title of the article (or an English translation of titles in other languages with a code for the original language), journal title, volume, issue, pagination, number of references, the address of first author, and nature of the item (original article, letter, book review, abstract, correction, etc.). Full entries are given only under the first author's name with cross-references from the other authors. Author names are listed by the last names and initials only. Journal names are highly abbreviated, using ISI's own abbreviations.

Example of Source Index

CHAUDHARY BN
UV SPECTRAL STUDIES OF A FEW NUCLEARn
SUBSTITUTED PHENOTHIAZINES
ANN NUC SCI 90(4):339-343 87 4R
LOHIA COLL CHEM LABS, CHURU, INDIA

CHEKUNOV AV
KUCHMA VG – ABYSSAL ASYMMERY OF—
CHENG LC
See ROGUS EM BIOC BIOP A 454 347 87

The *Source Index* also includes a *Corporate Index*, listing articles by the company or institution at which they were produced. The *Corporate Index* consists of two sections - Geographic and Organization. The *Geographic Section* is a primary index and it is arranged by location (country or state and then city) followed by the institution of the author's organization. Under the organization entry, the name of the first author is listed with the journal title abbreviation, volume, page and year of the

source article published – Full bibliographical information for each article is found in the *Source Index* under the first author's name.

Example of Corporate Index

MARYLAND
GREENBELT
NASA
SPACE FLIGHT CENTER
ALKEN A G APPL OPTICS 21 2421 87
BOPP B W ASTRONOMJ 87 1035 8

Permuterm Subject Index

It is called a natural language index because it uses current language (terminology) in the form of words from the title of articles listed in the *Source Index*, as subject headings. If a given term or word appears in several documents, then co-terms from the titles are listed below (as sub-entry) to sub-divide the main subject heading. Very common or uninformative terms may not appear as primary terms, but may use as co-terms. Terms, which frequently go together, may be listed as a hyphenated phrase, e.g. amino-acid or magnetic-resonance. Some terms have "see:" or "see also" references to related terms. The user matches up main-entry and sub-entry words for quick reference leading to relevant author's first name. Full information may then be obtained from Source Index, as described already.

Example of Permuterm Subject Index

ACETYLENEDICAR BOX
-> RODIONOV, LS

ACONITA SE —————> SUZUKI T
ACTIVITY —————> WRIGHT JA
BACILLUS —————> AGARWAL PK

ACOUSTIC
sa ION-ACOUSTIC
sa SOUND

Citation Index

The *Citation Index*, lists by first author, year of publication, and journal title and location (volume and pagination) every published and unpublished work cited in the references of articles published by the SCI's source journals during the year. Under it are listed the bibliographical data needed to identify any paper published during the year that cited the earlier work. Cited articles are listed by the name of the first author only. Then, beneath that, by year, then cited journal, volume and page number. Multiple articles citing the same paper are listed alphabetically by author's name. "In press" publications appear before specific cited papers. "Anonymous" publications are grouped together.

Example of Citation Index

ANSELIN F	
**	IN PRESS
	CANTOR B ACT METALL 24 845 89
63	CR HEBDOMAD SE ACAD 256 2616
	PEZATMJ SOL ST CHEM 18 381 89
75	T AM NUCL SOC 20
	BLANCHAR P T AM NUCL S 23 151 89
	WAGNER C METALL T-B 7 485 89

CD Version of Science Citation Index

Without author abstracts, SCI is updated quarterly, including annual cumulation on one disc with back-files upto 1980 with networking options. With author abstracts, it is updated monthly, including annual cumulation on two discs with back files upto 1991.

Expanded Science Citation Index

The *Science Citation Index Expanded (SCIE)* format is available through *Web of Science* and the online version through *SCISearch* on Internet. It is a multidisciplinary database, with access to current and retrospective bibliographic information, author abstracts and cited references found in 5800 major journals

across 164 scientific disciplines. Presently this database contains a current total of over 17 million records. It provides current information and retrospective data from 1945 backward. On an average 17,750 new records and 62,000 new cited references and 775 new cited references to patents are added per week to this database. As of January 1991, the database contains searchable, full-length, English-language author abstracts for approximately 70% of the articles in the database.

Social Sciences Citation Index (SSCI)

The *Social Sciences Citation Index (SSCI)* and *SocialSci Search* was started in 1973 and provides access to current and retrospective bibliographical information, author abstracts, and cited references found in over 1700 of the world's leading social sciences journals covering more than 50 disciplines. They also cover individually selected relevant items from approximately 3,300 of the world's leading science and technology journals. Some of the disciplines covered include: Anthropology, History, Industrial Relations, Information Science & Library Science, Law, Linguistics, Philosophy, Psychology, Psychiatry, Political Science, Public Health, Social Issues, Social Work, Sociology, Substance Abuse, Urban Studies and Women's Studies.

The full database contains almost 3.15 million articles from 1956 to the present, with addition of an average 2,700 new records and 50,500 new cited references per week. As of January 1992, it contains searchable, full-length, English language author abstracts for approximately 60% of the new articles in the database. It is available through both internet and intranet – via the *ISI Web of Science* updated weekly; back files to 1956. Also available in CD-ROM media with author abstracts: updated monthly, includes annual cumulation on one disc, available to 1992. Without author abstracts, it is updated quarterly, includes annual cumulation on one disc; available to 1981; and with networking options. It is also available online via both *Social SciSearch* - updated weekly with back-files to 1972 and distribution partners, updated weekly.

The printed version started in 1971, and is published three times a year with annual and multi-year cumulation. The various parts of *Social Science Citation Index* are on the pattern of SCI.

Arts & Humanities Citation Index (A&HCI)

The *Arts & Humanities Citation Index (A&HCI)* and *Arts & Humanities Search* was started in 1978 and provides access to current and retrospective bibliographical information and cited references found in over 1130 of the world's leading arts and humanities journals. They also cover individually selected, relevant items from approximately 7,000 of the world's leading science and social sciences journals. Some of the disciplines covered include: Archaeology, Architecture, Art, Asian Studies, Classics, Dance, Folklore, History, Language, Linguistics, Literary Reviews, Literature, Music, Philosophy, Poetry, Radio, Television and Film, and Religion.

The full database contains over 2.3 million articles from 1975 to the present, with an addition of average 2250 new records and 15,250 newly by cited references per week. As of January 2000, the index contains searchable, full-length, English-language author abstracts (as available) for the new articles into the database. It is available through both internet and intranet – via the ISI *Web of Science* – updated weekly; includes author abstracts from 1999 onwards; back-files to 1975 and network options. Also available in CD-ROM media updated triannually, subscription includes annual cumulation on one disc; back-files to 1990. It is available online via *Arts & Humanities Search* – via DIALOG, Datastar and OCLC updated weekly; back-files to 1980. The printed version started in 1978 and is published three times a year with annual and multi-year compilations.

Web of Science

The *Web of Science* is the web-based service that allows one to search the references in the sciences, social sciences and the arts & humanities. It provides access to over 8500 international journals. It actually comprises of

three citation index databases: the *Science Citation Index*, the *Social Science Citation Index*, and the *Arts and Humanities Citation Index*. The *Web of Science Proceedings* is also a part of this service and covers more than 1100 most significant conferences, symposia, seminars, colloquia, workshops and conventions from 1990 onwards and in a wide range of disciplines in science and technology. The *Web of Science* also offers navigation to electronic full text journal articles, genetic information and chemical patent databases. This service is available to users by institutional subscription.

The important features of the *Web of Science* are as follows. Anybody can: (i) potentially search all three citation databases simultaneously, over all the years of their electronic coverage; (ii) use hyperlinks between records to navigate forward, backward or through the research literature using the unique links made possible only with citation data; (iii) perform related records searches over the entire database at once; (iv) link to original article information when a cited reference of interest is found (for those original articles covered in the database); (v) receive weekly updates to "times cited" information; and (vi) links to electronic journals for recent articles.

The brief features of the three citation indexes, as covered by the *Web of Science* are given in the Table 1.

The *Web of Science* provides a wide access to literature published by Indian scientists in domestic and international journals. The number of Indian domestic journals indexed in *Web of Science* has been increasing over the years, particularly after 1990 onwards. The number of such Indian domestic journals has increased from 38 in 1996 to 49 in 2002. Similarly, the number of articles contributed by Indian scholars and indexed in *Web of Science* from 1993 to 2003 is given in the Table 2.

Specialty Citation Indexes

The *Specialty Citation Indexes* provide convenient targeted access to current and retrospective bibliographic information and

Table 1 — Features of citation indexes covered in *Web of Science*

Features	Science Citation Index (SCI)	Social Sciences Citation Index (SSCI)	Arts and Humanities Citation Index (AHCI)
Subscribed years	1945-present	1956-present	1975-present
Coverage	5300 major journals across 164 scientific disciplines	1,700 journals across 50 disciplines and selected items from additional 3,300 additional titles	1,100 journals and selected items from 6800 additional titles
Updates	Weekly	Weekly	Weekly
Notes	Author-written abstracts for more than 70% of articles in the database	Author-written abstracts for more than 60% of articles in the database	Added indexing to clarify article contents
Full database contain	Over 14 million articles	Almost 3 million articles	Over 2.3 million articles

Table 2 — Number of articles from Indian scholars covered in *Web of Science*

	Total	SCI	SSCI	AHCI
1993	15,924	15,340	691	
1994	16,210	15,652	555	
1995	16,885	16,373	546	
1996	17,037	16,487	606	
1997	16,731	16,269	475	140
1998	18,168	17,738	501	112
1999	19,159	18,710	523	94
2000	17,934	17,500	562	91
2001	19,831	19,339	621	69
2002	20,852	20,409	523	97
2003	23,605	23,138	666	91

Source: *Web of Science*

Note. There is some overlapping of data under SCI, SSCI and AHCI

author abstracts from the world's leading journals, books, and proceedings in a number of specialties. They are multidisciplinary databases of journal literature of particular scientific discipline, providing information on particular subject and in its related areas. They also reach outside the core literature to provide selected coverage of related articles from the ISI database of over 16,000 scholarly publications in the sciences, social sciences, and arts and humanities. They are available in CR-ROM media and updated bi-monthly with an annual cumulation. These indexes have powerful search capabilities, including *Citation Reference Searching*, *Related Records*, and *Keyword Plus*. Through *Citation Reference Searching*, the research scholars can track the research of their colleagues and competitors, impact of research, who is citing whom, what is hot in the field etc. The *Related Records* facility expands the effectiveness of cited reference searching and locates all the articles that have one or more references in common. The *Keyword Plus* provides additional search terms taken from an article's bibliography.

The following specialty citation indexes are currently available:

Biotechnology Citation Index (BTCI)

The *Biotechnology Citation Index* provides convenient access to current and retrospective bibliographic information, author abstracts, and author and publisher information from over 235 world's leading core specialty journals, important books and conference proceedings in biotechnology, in addition to coverage of related individual articles from multidisciplinary ISI collection of 8,000 premium scholarly journals. It is published bi-monthly and provides large coverage - more than 107,000 biotechnology source items per year from more than 3200 publications. The BTCI covers a wide range of disciplines, including: Anti-Viral & Anti-Cancer Biotherapy; Biocontrol; Biorecovery; Biosensors; Fermentation; Food Microbiology; Human Genome Research; Molecular & Clinical Genetics; Molecular Microbiology; Plant Somatic Cell Culture; Protein Sequencing and

More. It is available in CR-ROM media – updated bi-monthly; includes the most recent five years of data; additional back-files to 1991; and networking options.

Biochemistry and Biophysics Citation Index (BBCI)

The *Biochemistry and Biophysics Citation Index* provides convenient access to current and retrospective bibliographic information, author abstracts, and author and publisher information from over 450 world's leading core specialty journals, important books and conference proceedings in biochemistry and biophysics, in addition to coverage of related individual articles from multidisciplinary ISI collection of 8,000 premium scholarly journals. It is published bi-monthly and provides large coverage - more than 177,000 biochemistry and biophysics source items per year from more than 3600 publications. The BBCI covers a wide range of disciplines, including: Bioenergetics; Cellular Chemistry; Clinical Chemistry; Environmental Biotechnology; Food & Medicinal Chemistry; Molecular Microbiology; Molecular Pharmacology; Neurochemistry; Plant Molecular Biology; Photosynthesis; Thermobiology and more. It is available in CR-ROM media – updated bi-monthly; includes the most recent five years of data; additional back-files to 1992; and networking options.

Chemistry Citation Index (CCI)

The *Chemistry Citation Index* provides convenient access to current and retrospective bibliographic information, author abstracts, and author and publisher information from over 500 world's leading core specialty journals, important books and conference proceedings in chemistry, in addition to coverage of related individual articles from multidisciplinary ISI collection of 8,000 premium scholarly journals. It is published bi-monthly and provides large coverage - more than 144,000 chemistry source items per year from more than 1700 publications. The CCI covers a wide range of disciplines, including: Analytical Chemistry, Computational Chemistry; Electrochemistry;

Inorganic Chemistry; Materials Chemistry; Nuclear Chemistry; Organic Chemistry; Organometallic Chemistry; Physical Chemistry; Polymer Chemistry; Radiochemistry and more. It is available in CR-ROM media – updated bi-monthly; includes the most recent five years of data; additional back-files to 1991; and networking options.

CompuMath Citation Index (CMCI)

The *CompuMath Citation Index* provides convenient access to current and retrospective bibliographic information, author abstracts, and author and publisher information from over 600 world's leading core specialty journals, important books and conference proceedings in computer science and mathematics, in addition to coverage of related individual articles from multidisciplinary ISI collection of 8,000 premium scholarly journals. It is published bi-monthly and provides large coverage - more than 55,000 computer science and mathematics source items per year from over 6,000 publications. The CMCI covers a wide range of disciplines, including: Computer Science – Artificial intelligence, Cybernetics, Hardware & Architecture, Information Systems & Technology, Software Graphics & Programming; Mathematics; Operations Research and Management; Mathematical Physics; Robotics & Automatic Control; Statistics & Probability, and more. It is available in CR-ROM media – updated monthly; includes the most recent five years of data; additional back-files to 1993; and networking options.

Materials Science Citation Index (MSCI)

The *Materials Science Citation Index* provides convenient access to current and retrospective bibliographic information, author abstracts, and author and publisher information from over 500 world's leading core specialty journals, important books and conference proceedings in materials science, in addition to coverage of related individual articles from multidisciplinary ISI collection of 8,000 premium scholarly journals. It is published bi-monthly and provides large coverage - more than 138,000 materials

science source items per year from more than 1700 publications. The MSCI covers a wide range of disciplines, including: Adhesives; Biomaterials; Ceramics; Coating Technology; Composite Materials; Fabrics & Fibres; Metals & Metallurgy; Minerals; Paper & Wood technology; Plastics & Polymer Engineering; Powders; Semiconductors; Surface Science and more. It is available in CR-ROM media – updated bi-monthly; includes the most recent five years of data; additional back-files to 1992; and networking options.

Neuroscience Citation Index (NCI)

The *Neuroscience Citation Index* provides convenient access to current and retrospective bibliographic information, author abstracts, and author and publisher information from over 300 world's leading core specialty journals, important books and conference proceedings in neurosciences, in addition to coverage of related individual articles from multidisciplinary ISI collection of 8,000 premium scholarly journals. It is published bi-monthly and provides large coverage - more than 82,000 chemistry source items per year from more than 2800 publications. The NCI covers a wide range of disciplines, including: Behavioral Neurology; Carebrovascular Disease & Metabolism; Developmental Neuroscience; Electroencephalography; Epilepsy Research; Molecular Brain Research; Neural Networks; Neurogenetics; Neuroimaging; Neurosurgery; Psychopharmacology and more. It is available in CR-ROM media – updated bi-monthly; includes the most recent five years of data; additional back-files to 1991; and networking options.

OTHER PRODUCTS OF ISI

Essential Science Indicators

The *Essential Science Indicators* is essentially a compilation of statistical information (publication, citation, and cites per paper counts). It identifies the "essential core" of journal articles, scientists, institutions, countries, and journals from the large data corpus by

setting selection criteria (a certain number of citations received) for each of the disciplines. It is accessible to subscribers through a web interface, is updated every two months. During the course of an year, the data series presented covers 10 years plus a successive number of recent two-month periods, eventually reaching an 11-year time span. At the end of the year, the compilation reverts to a 10-year data set, dropping off the oldest year of the series.

In a recent 10-year period, ISI recorded about 9 million articles, notes, and reviews, published in roughly 9 million indexed journals. The *Essential Science Indicators* categorizes these journals into 22 broad disciplines. Each journal is assigned to one of the 22 disciplines. It then assigns each paper to a discipline – and only one discipline – based on the journal in which it appears. In case of multidisciplinary journals, special processing is carried out to assign individual papers to fields based on the predominate field of the paper's citation and references. The number of citations received by these 9 million items is roughly 53 million.

About 50,000 scientists names out of 3 million scientist's names and, 3,000 institutional affiliations out of a half million institutional affiliations appear in the *Essential Science Indicators* in the 10-year data surveyed by ISI. This represents the top 1% of the authors and institutional affiliations in terms of total citations in each of the disciplines in ISI database. For countries, about 150 are selected out of about 200 scanned, and for journals about 4500 out of 9000, both representing the top 50% by discipline and total citations over a 10-year period.

Journal Citation Reports (JCR)

The *Journal Citation Report* is a unique multidisciplinary research tool ideal for a broad range of practical applications by a variety of information professionals. It acts as a tool for ranking, evaluating and comparing journals. It presents quantifiable statistical data that provides a systematic and objective way to determine the relative importance of journals

within their subject categories. The type of data covered include ISSN numbers, total cites, impact factor, immediacy index, year-wise distribution of articles and cited half-life of journals.

The impact factor of a journal implies the frequency with which the average article of the journal has been cited in a particular year. Normally, the citations received by a journal in a particular calendar year for its source items published in the preceding calendar year/s are taken into account for determining the impact factor. Immediacy Index is a measure to show how quickly the 'average article' of a particular journal is cited, and is expressed by the ratio of the number of citations received in a particular year. Similarly, the number of journal-publication-years from the current year backwards which account for 50 per cent of the total citations given by the citing journals in the current year is called the citing half-life.

The *Journal Citation Report* is available in CD-ROM format and comes in two editions. The first is the *Science Edition*, which reports current information on nearly 6,000 of the world's leading science and technology journals published by over 3,000 global publishers from 60 countries. Its 2000 edition covered 5684 S&T journals and covers 160 subject categories. The second is the *Social Sciences Edition*, which covers about 1600 leading international social sciences journals from the ISI database. The CD-ROM version is published annually in the summer following the year of coverage; networking options is also available.

The *Journal Citation Report* has several advantages and capabilities. For librarians, it helps the user to manage and maintain journal collections and budget for subscription. It enables the publishers to monitor their competitors, identify new publishing opportunities and make decisions regarding current publications. It also assists the editors in assessing the effectiveness of editorial policies and objectives and tracking the standing of their journals. It enables the authors to identify journals in which to publish, confirm the

status of journals in which they have published and identify journals relevant to their research. For information analysts, JCR helps to track bibliometric trends, study the sociology of scholarly and technical publications, and study citation patterns within and between disciplines.

CONCLUSION

The citation indexes have become the most widely used information products in the world today. They offer a number of advantages over conventional subject indexes. The most widely used and well designed product of ISI in terms of software development, international coverage and flexibility to use is the *Web of Science*, which is providing current and retrospective information of highest quality from its most comprehensive, multidisciplinary and bibliographic cum citation information from over 8000 scholarly journals in the sciences, social sciences and arts & humanities developed over a period of 30 years. In addition, the *Web of Science* also providing links to electronic full text journals and their articles and other subject bibliographic databases. About 3.5 million scientists, scholars and researchers use the ISI products worldwide today. The citation indexes also led to the development of theoretical foundation of information science and the development of bibliometrics, informetrics and scientometrics as an academic and research field. It is widely used as an effective tool for generating relevant data, which can be used by policy-makers in the formulation of S&T policies, allocation of resources and for evaluating national science, institutions and individual scholars.

The credit for developing the citation indexes and other products by ISI goes to Dr Eugene Garfield, who struggled over the years to persuade scientists and other scholars about the need and value of a unified index to the literature. His intellect, drive and business acumen and passion of systematically organizing information led to the development of various tools developed by ISI.

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