

Insights Into InCites

Journal Citation Reports and Essential Science Indicators

by Ruth A. Pagell

For decades, ranking of university research relied heavily on Thomson Reuters products, particularly Journal Citation Reports (JCR) and Essential Science Indicators (ESI). At the Special Libraries Association (SLA) annual conference in June, the company demonstrated new visualization capabilities added to JCR. What I saw at SLA is only a part of the upgrades and integration that is in progress as JCR and ESI are released on the InCites platform and made more visible in Web of Science.

In July 2014, the Thomson Reuters IP & Science business unit began the integration of Web of Science (WoS) and the products on the InCites platform (researchanalytics.thomsonreuters.com/incites). As with every WoS module, what you see depends on your subscription. The additional modules require an upgrade and a second password. Subscribers can use the add-on tools to identify high impact journals (JCR) and highly cited institutions (ESI) and perform basic analytics.

Most librarians, information professionals, and researchers are familiar with citation indexes and their applications. We use them to identify key articles and authors; to evaluate faculty, researchers, and departments; and to aid in collection development. For the past 10 years, the metrics have provided underlying data for ranking research universities. In our evidence-based world, it is interesting for readers of *Online Searcher*, whether or not they subscribe to any of these products, to see how Thomson Reuters is integrating its interfaces to give more power to its users.

HISTORICAL INSIGHTS

Citation indexes have a long history. From the early 1960s until 1992, the Citation Indexes and JCR were a product of the Institute for Scientific Information (ISI). In 1992, Thomson purchased ISI, and in 2008, Thomson acquired Reuters to become Thomson Reuters. Despite the changes in ownership, the business has

stayed in Philadelphia, WoS and its associated research and scholarly applications have been enhanced to meet the growing needs for evidence by researchers, funders, publishers, and policymakers.

In 1975, ISI initiated a print version of JCR as an offshoot of the citation indexes. In the late 1980s, it appeared in microfiche; in 1994, it migrated to CD-ROM; and it went online in 1997 along with the rollout of Web of Science. From 2001 to 2014, the number of publications has more than doubled from 4,900 to about 11,000, representing more than 80 countries.

In his November/December 2005 Péter's Picks & Pans column in *ONLINE* (Vol. 29, No. 6, pp. 54–57), Péter Jascó listed JCR on the Web as one of his picks. He reviewed new features, as I do in this product update. My focus is on the interface, not a description or analysis of the metrics, and I illustrate how subscribers to JCR and ESI can use the new integration of some JCR and ESI indicators into WoS, visualization, and customization.

INSIGHTS INTO THE IMPACT FACTOR

JCR provides quantitative metrics based on citations appearing in articles in journals from Science Citation Index (SCI) and Social Science Citation Index (SSCI). The metrics are used to evaluate the quality of journals. The basic measurement is the impact factor, one of nine current indicators for each journal.

According to Thomson Reuters:

The journal Impact Factor is the average number of times articles from the journal published in the past two years have been cited in the JCR year. The Impact Factor is calculated by dividing the number of citations in the JCR year by the total number of articles published in the two previous years. An Impact Factor of 4.4 means that, on average, the articles published one or two years ago have been cited 4.4 times. The citing works may be articles published in the same journal. However, most citing works are from different journals, proceedings, or books indexed by Web of Science.

–admin-apps.webofknowledge.com/JCR/help/h_impact.htm

INTEGRATION WITH WEB OF SCIENCE

The one upgrade available to all WoS subscribers is the integration of limited JCR data into WoS records. All WoS records have a link to “View Journal Information,” which displays the JCR category, quartile, and publisher information.

For example, take a highly cited 2009 article published in the *Journal of Supply Chain Management*. The journal title shows up in the Research area of Business & Economics and the WoS category of Management. Subscribers to the new JCR platform see the impact factor and journal rank. (See Figure 1 at right.)

Click through on Journal Citation Reports and log in to see a table of Key Indicators, plus a variety of graphics, including a visual map of journal relationships (perfect for those who are visually inclined). (See Figure 2 below.)

Upgrades to JCR include visualization of relationships among key topic areas and relationships among journals, expanded years of data, limiting capabilities, improved graphing, and downloading. You can create rankings by category or by journal. The default image is a “node map,” showing the top categories by number of journals out of 232 categories. A list of all categories follows. (See Figure 3 below.) Because the



Figure 1. JCR information in WoS records for subscribers to the new platform

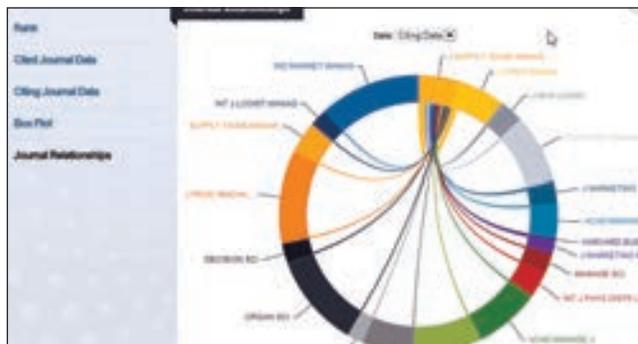


Figure 2: Map of Journal Relationships by Citing Data

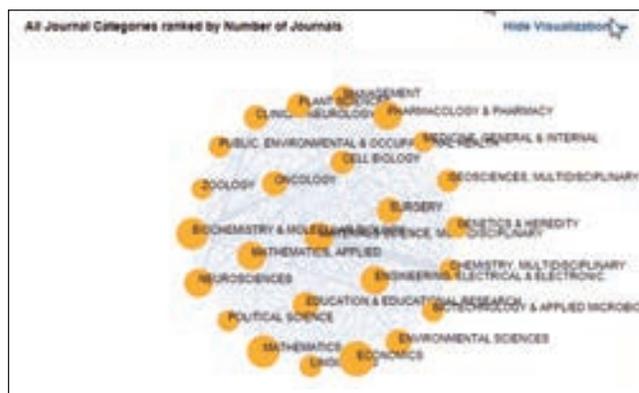


Figure 3. Node Map of Journal Categories ranked by Number of Journals (included in SCI and SSCI)

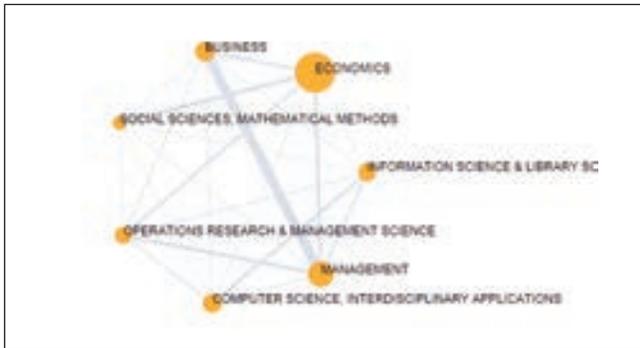


Figure 4: Personal Node Map



Figure 5. Journal titles in Information & Library Science Ranked by Impact Factor

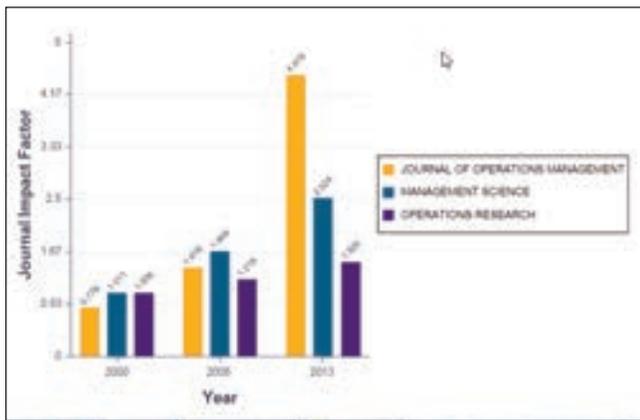


Figure 6. Comparing Journals by Impact Factor

default node map only displays the top categories, you can select your own categories from SCI and SSCI to create your own relationship map. (See Figure 4 above.)

Clicking on a category displays its historical metrics from 1997, including number of journals, articles, total cites, median and aggregate impact factor, and three metrics related to immediacy and half-life. Information can be downloaded or displayed in a graph for each category.

To view the journals in a category, click on the number of titles, for example, Information Science & Library Science. The map is reconstructed to show the top journal titles ranked by impact factor and a list by impact factor. The width of the lines shows the relationship between journal titles. You can customize the metrics that you want to display. (See Figure 5 at left.)

Filter by journal, category, country, and publisher to answer individual questions. I was interested in changes to the category Operations Research & Management Science, so I selected three of the major journals in the category, comparing them over time on impact factor. (See Figure 6 at left.)

Many scholarly articles question and criticize the use of the impact factor for evaluating journals and researchers. One result of the criticisms has been the rise of using alternative metrics for evaluation. This update to JCR provides researchers with more customization of the data and gives more evidence for those on both sides of the debate.

ESSENTIAL SCIENCE INDICATORS

JCR is used to measure the performance of top journals. The analytics in ESI populate the following products:

- **Research Fronts** – Algorithmically derived topics reflect research-intensive and breakthrough areas of current science.
- **Highly Cited Papers** – The most recent 10 years of data
- **Hot Papers** – If a paper published in the past 2 years is in the top 0.1% for citations of its broad field in the past 2 months, it gets an icon indicating “Hot Paper”
- **ScienceWatch.com** – Analysis from the data about the scientists, institutions, and journals

Use ESI for the analysis of the research performance of institutions and nations and to identify trends (Research Fronts) and for benchmarking and ranking research institutions.

ESI provides summary data, using articles that are in the top 1% of all publications in one of 22 broad fields throughout a rolling 10-year period (Highly Cited Papers). See Table 1 on page 19.

INTEGRATION OF ESI WITH WOS

Only ESI subscribers see the integration with WoS. The icons for highly cited or hot papers appear in WoS records next to the number of citations. Being highly cited is dependent on both the broad topic and publication date. Within the WoS article record is an entry for Performance Trends: Essential Science Indicators. Clicking on the entry takes you to ESI and citation information for the article. You may also see the icon indicating that the article is in a “research trends” field.

An April 7, 2014, Thomson Reuters White Paper, “Enhancing Essential Science Indicators for a More Comprehensive and Accurate Understanding of Scholarly Research” by Simon Pratt, Jennifer Minnick, and Joel Frank, provides a complete list of journal titles in the appendix (wokinfo.com/media/pdf/ESI).

TABLE 1. Citation Thresholds in ESI

	Citation Percentile	Data years examined (rolling)
Researchers	1%	10
Institutions	1%	10
Countries	50%	10
Journals	50%	10
Highly Cited Papers	1%	10
Hot Papers	.1%	2

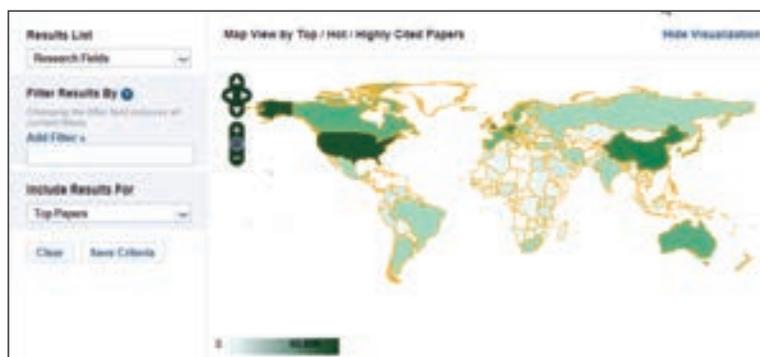


Figure 7. Map View of Highly Cited Papers by Topic for Mainland China

Total: 22	Institutions	Web of Science Documents	Cites	Cites/Paper	Top Papers
1	CHINESE ACAD SCI	226,613	2,399,259	10.59	31
2	PEKING UNIV	42,781	455,749	10.65	14
3	UNIV HONG KONG	31,343	426,072	13.59	16
4	ZHEJIANG UNIV	49,571	403,026	8.11	47
5	TSING HUA UNIV	45,324	400,810	8.84	62

Figure 8. Top Research Institutions in China

Visualizations play a key role in understanding the data in ESI. The introductory visualization for ESI is a world map. Click on a country to see its output for the 22 topics. Click on a different country, and the order of topics will change. For example, when I clicked on China, ESI provided a list of the top research institutions in mainland China, based on citations. (See Figures 7 and 8 above.)

You can create a variety of pairings using the filters and the map, such as journals by country or by topic. However, you cannot create a list of top institutions in mainland China in a specific research field. You could only do this if you had an additional subscription to InCites Analytics.

INSIGHTS FOR EVERYONE

Even without a subscription, you can access a list of the more than 3,000 highly cited researchers for 2014 (highlycited.com/index.htm#table). You can select one of the 22 topical areas from ESI, sort by institution, and search by country. For example, 88% of the researchers in Economics & Business are from English-speaking countries. You can scan the list for areas of concentration of research in a country.

Thomson Reuters expects to complete the integration across the Web of Science and InCites platforms in summer 2015. Product director Julia Laurin told me, “JCR, which has a publisher-oriented focus, was previously part of Web of Science and is consistent with its terminology, while ESI with its institutional focus, was a part of our research analytics suite and its terminology lines up with that of InCites.”

The Thomson Reuters IP & Science team should be applauded for its appropriate use of technology to empower its high-end users. The visualizations introducing JCR and ESI signal that you are seeing a new interface. Filtering, expanded data coverage, and graphing, plus additional features add to functionality and customization for users from the

individual researcher to government policymakers.

The InCites platform on which JCR and ESI sit offers a broad range of tools for further analytics and customization.

I would like to thank Jennifer Breen and Don Sechler from Thomson IP & Science for their help.

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