Research Intelligence

SciVal @TUM – Introductory Webinar

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Agenda – SciVal Introduction at TU Munich

• Introduction & Bibliometrics

• SciVal Product Concept

• Content – Scopus + additional linked data (e.g. patents, funding, media)

• Metrics – responsible selection and use

• Live Demo
  ➢ Overview, incl. SciVal Topics
  ➢ Benchmarking
  ➢ Collaboration
  ➢ Trends
  ➢ Reporting + My SciVal

• Q&A
SciVal Introduction
The variety of stances among runners in the 100-meter sprint at the first modern Olympic Games, held in Athens in 1896, is surprising to the modern viewer. Thomas Burke (second from left) is the only runner in the crouched stance - considered best practice today - an advantage that helped him win one of his two gold medals at the Games.
Bibliometrics – expert view

"Mehr Licht"

Was kann die Bibliometrie in der heutigen Zeit?

Von Lutz Bornmann, München

Die Bibliometrie kann als eigenes Forschungsgebiet sehr breit für die Untersuchung Wissenschafts-relevanter Themen eingesetzt werden. Man muss es allerdings sachgemäß tun.

Quelle: https://www.laborjournal.de/rubric/essays/essays2016/e16_10.php
Bibliometrics – praktiker view

Responsible Metrics - Verantwortlicher Umgang mit Metriken

Dr. Reingis Hauck, Leibniz Universität Hannover


Quelle: [https://www.repo.uni-hannover.de/handle/123456789/4949](https://www.repo.uni-hannover.de/handle/123456789/4949)
The world of research is becoming more competitive leading to challenges for research management

**Trends**
- R&D budgets under pressure in difficult economic climate
- 7M researchers increasing at +1% per year; annual output growth of +3%
- Emerging research nations changing dynamics of research landscape

**Expectations**
- Research drives sustainable economic development
- Faster turnaround and payoffs from science
- High standards of accountability and transparency

**Needs**
- Identify strengths and shortcomings to inform research decisions
- Accelerate collaboration, secure more funding
- Retain and hire best-in-class researchers

Reference: International Comparative Performance of the UK Research Base 2013
Global Trend #1 - Increase in Volume of Publications in Scopus globally

China main driver for growth in volume of peer-reviewed publications in Scopus globally.
Global Trend #1 - Increase in Volume of Publications in Scopus in DACH region

Each country in DACH more than doubled its total publication output in Scopus.
Global Trend #2 – Global trends in impact per country/region (FWCI) – China rising, EU declining

China has caught up in terms of avg. FWCI over last 20 years. Avg. FWCI above 1.0 since 2017.

FWCI of EU28 and Germany decreasing since 2014.
Make decisions by “triangulating” information sources

Strategic Planning for Research

Your scientists

External references

Research Intelligence
Reliable data
A comprehensive approach to confidently assess and deliver on your strategic research investments

Relying on trusted Scopus data, but delivering unique insights
Metrics and analytics at unprecedented scale and precision

RESEARCH OUTCOMES

SciVal

Informs long term research strategy
Should we invest in research areas?
- Is there white space?
- What is the competitive landscape?
- Do we have the capabilities?
- Do our research areas make impact?

Scopus®

Supports daily research activity
How will we do research?
- Who are the leading experts?
- What is the latest research available?
- Who has done this before?
- How do I solve a research problem?
SciVal – Overview
SciVal – product layers (Content, Technology, Analytics)

Using advanced data analytics super-computer technology, SciVal allows you to instantly process an enormous amount of data to generate powerful data visualizations on-demand, in seconds.

*Text + Data Mining Technology (HPCC→Spark + NLP*)

Publication, citation and usage data (Scopus)
Awarded grants, mass media mentions, patent-article citations

*Natural Language Processing via Elsevier's Fingerprint Engine: https://www.elsevier.com/solutions/elsevier-fingerprint-engine
... additional linked data sources

Publication, citation, usage data (Scopus)
mass media mentions, patent-article citations

Scopus
Publication, citation, usage data

newsflo
bespoke media monitoring

WIPO
World Intellectual Property Organization

European Patent Office

Intellectual Property Office

Additional linked data sources
Scopus/SciVal – Usage (Downloads) data vs. Citations

Month (1 = Jan 2008)

World’s largest Abstract and Citations Database

77.3M records from 24.0K serials, 119K+ conferences and 215K books from more than 5000 publishers and 105 countries

- Updated daily - approximately 10,000 articles per day indexed
- 8.97M open access documents
- “Articles in Press” from >8,075 titles
- 40 different languages covered
- 5,527 active Gold Open Access journals indexed

### JOURNALS
- 24,039** active peer-reviewed journals
- 294 trade journals
- 5,527 Gold OA Journals (DOAJ/ROAD)
  - Full metadata, abstracts and cited references (refs post-1970 only)
  - Funding data from acknowledgements
  - Citations back to 1970

### CONFERENCES
- 100K+ conference events
- 9.5M conference papers
- Mainly Engineering and Computer Sciences

### BOOKS
- 852 book series
- 215K stand-alone books
- 1.77M items
- Focus on Social Sciences and A&H

### PATENTS*
- 43.7M patents
  - From 5 major patent offices
    - WIPO
    - EPO
    - USPTO
    - JPO
    - UK IPO

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*Journals may be classified in multiple subject areas: this count includes current actively indexed titles only

**Total number of Scopus journals in database including inactive titles is 39,743

Scopus Sources List: [https://www.scopus.com/sources](https://www.scopus.com/sources)
Scopus – data processing & data model

- 77 million Items
- 1.4 Billion cited references dating back to 1970
- ~70,000 Main institutional profiles
- 12 million Author profiles

+ 5,000 Publishers
22,800+ Serial titles
+150,000 Books

- Identify and analyze which journals to read / submit to
- Help researchers manage career – citation counts and h-index
- Decide what, where and with whom to collaborate
- Track impact of research; monitor global research trends
- Find out what already exists in the global world of research
- Determine how to differentiate research topics, find ideas
SciVal in a nutshell

SciVal offers quick, easy access to the research performance of 220 nations and more than 16,000 research institutions worldwide, and groups of institutions.

- **Visualize research performance**
- **Benchmark your progress**
- **Develop collaborative partnerships**
- **Analyze research trends**

**Ready-made at a glance snapshots of any selected entity**

**Flexibility to create and compare any research groups**

**Identify and analyze existing and potential collaboration opportunities**

**Analyze research trends to discover the top performers and rising stars**
SciVal – Metrics
A global movement, being adapted in mature bibliometric markets

Leiden Manifesto

1. Quantitative evaluation should support qualitative, expert assessment
2. Measure performance against the research missions of the institution, group or researcher
3. Protect excellence in locally relevant research
4. Keep data collection and analytical processes open, transparent and simple
5. Allow those evaluated to verify data and analysis
Responsible use and careful selection of metrics

Always use both qualitative and quantitative input into your decisions

Always use more than one research metric as the quantitative input

There are 6 factors, which can affect the value of a metric:
- Size
- Publication-type
- Manipulation
- Discipline
- Database coverage
- Time

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Research Metrics Guidebook

This comprehensive metrics guidebook is intended to be a straightforward, practical companion for you to find the right metrics to meet your objectives.

- Understanding metrics
  - Scopus as data source

- Selection of appropriate metrics
  - What affects their values, besides performance?

- For each metric
  - Situations in which they are useful
  - Formulas and calculation examples
  - When to take care and how to address short-comings
  - Worked examples

Download here: Research Metrics Guidebook
Use Cases for SciVal

SciVal supports the needs of a broad range of institutional users by providing ready-made, at-a-glance snapshots for flexible, institution-specific insight.

- **Vice chancellors of research**
  - 360 degree Performance Overview to inform strategic planning
  - Identify institution’s strengths and short-comings

- **Research administrators**
  - Create management-level reports
  - Accelerate institutional and cross-institutional collaboration
  - Support and win large grants

- **Department heads**
  - Evaluate researcher and team performance for recruitment and retention decisions
  - Model-test scenarios by creating virtual teams

- **Researchers**
  - Raise visibility and highlight achievements
  - Expand networks
  - Locate collaborators and mentors
SciVal - Topics/Topic Clusters
Going beyond evaluation and benchmarking …

- The **Trends Module** was launched in 2015 for **in-depth analysis** of any research area
  - created by the user
  - using a predefined Scopus Journal category.

- But what if we could **help the user find research areas to analyze**?

- Working together with SciTech Strategies on a **groundbreaking new concept** for research planning and analysis…
So that we could …

… Help Researchers
- **Identify topics with high momentum and most likely high funding success rates.**
- **Showcase** that they are active in topics with high momentum.
- **Find the best potential co-authors** in those topics.
- **Identify emerging & related topics** with high momentum they should be aware of.

… Help Research managers
- Identify pockets of well funded research topics in research portfolio.
- Find the **top performers** and **rising stars** in those areas for recruitment, tenure and collaboration.
- **Showcase** that their institution is active in topics with high momentum.
- **Identify which topics other universities** are active in that have high momentum.
Solution

• We have identified ~96,000 global research topics by clustering all of Scopus and ranked them by Prominence.

• Prominence is a new indicator that shows the current momentum of a topic by looking at very recent citations*, views* and CiteScore* values.

• Prominence = momentum (not the same as importance!).

• Prominence correlates w. funding – helps researchers and research managers identify topics in which funding will increase.

*Weighting: citations 50%; views 40%; CiteScore 10%
A groundbreaking concept

- **Researchers in topics with high prominence receive more funding on average** – We have evidence that researchers in prominent topics receive more funding (per researcher) than their peers in other topics.
- **Help improve grant applications** – we can truly help researchers to increase their grant success rate by focusing on high prominence topics.
- **Topics resonate with researchers** – researchers recognize them intuitively and agree with the level of granularity.
Further background information on Topics

- **Research Portfolio Analysis and Topic Prominence**
  Richard Klavans and Kevin W. Boyack

- **Identifying Emerging Topics in Science and Technology**
  Henry Small, Kevin W. Boyack and Richard Klavans

- **The dawn of predictive analytics to measure research performance: SciVal’s Topic Prominence**
  Elsevier Connect by Martin Edling Andersson

- **WEBINAR**: Introduction to Topic Prominence in Science

- **WEBINAR**: Advanced applications of Topic Prominence in Science

- **WEBINAR**: Where am I a Key Contributor & other Topic Prominence in Science developments
Your Elsevier contact for questions on SciVal:

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Thank you for your attention!