Follow the Yellow Brick Road?
Overcoming Beliefs in Wizard-conjured Data & Metrics

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2022 Bibliometrics and Research
Impact Community (BRIC)
Conference
June 16, 2022

Hello!

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@metric_guru

- From Kansas
- Love sewing, hiking, playing violin

Outline

◎ Impact services at Virginia Tech University Libraries

◎ Examples of research impact requests & questions

◎ Responses to questions

- Research impact reports
- Research analytics

◎ Invitations to present on research impact topics

◎ Elements pilot projects for two colleges

◎ Integrating responsible research assessment throughout projects & services

◎ Looking to the future

Disclaimer & Background

◎ Wizard of Oz comparisons are for illustrative & metaphorical purposes and not meant to be compared directly to individuals

◎ I'm from Kansas and can't resist a good Wizard of Oz story or comparison.

◎ Also, I once painted a yellow brick road for a community service project in a park in Wichita in 2002.

Top photo by Wichita Mom; bottom photo by Lucky Splinters

Research Impact Services at Virginia Tech

◎ Consultations

  ○ Offered to individual researchers & faculty members, administrators

  ○ Topics: individual research assessment for P&T dossiers, bibliographic database searching & exporting, bibliometric & altmetric analyses, interpretation of metrics, research communication, researcher profiles

◎ Workshops

  ○ Target audience: faculty & graduate students

  ○ Topics: see [Past Workshops](#) page

Example of Customized Support to Individual Researcher

"Let's say that an author by the name of Smith is a second author on a publication that cites my 2014 study and that Smith is a fourth author on a publication that cites my 2015 publication. Would there be a way for me to do a search that would indicate that BB Smith cited me twice without me manually going through the citations for each of my publications? In other words, is there a way for me to do a search that would cross-reference all of the authors who have cited at least one of my publications and so that I could easily tell who has cited me the most? [. . .] That would mean I would need to manually create a database with 2,400 author names and then see which ones repeat. In today's day and age I would imagine (and hope) that there is *a quick way to do this.*"

Purpose of this request

◎ For tenure evaluation, the faculty member needed to find external reviewers in his field that he has no working or professional relationship with.

◎ Wanted these potential external reviewers to be well known in the field, familiar with his work, and have highly cited work.
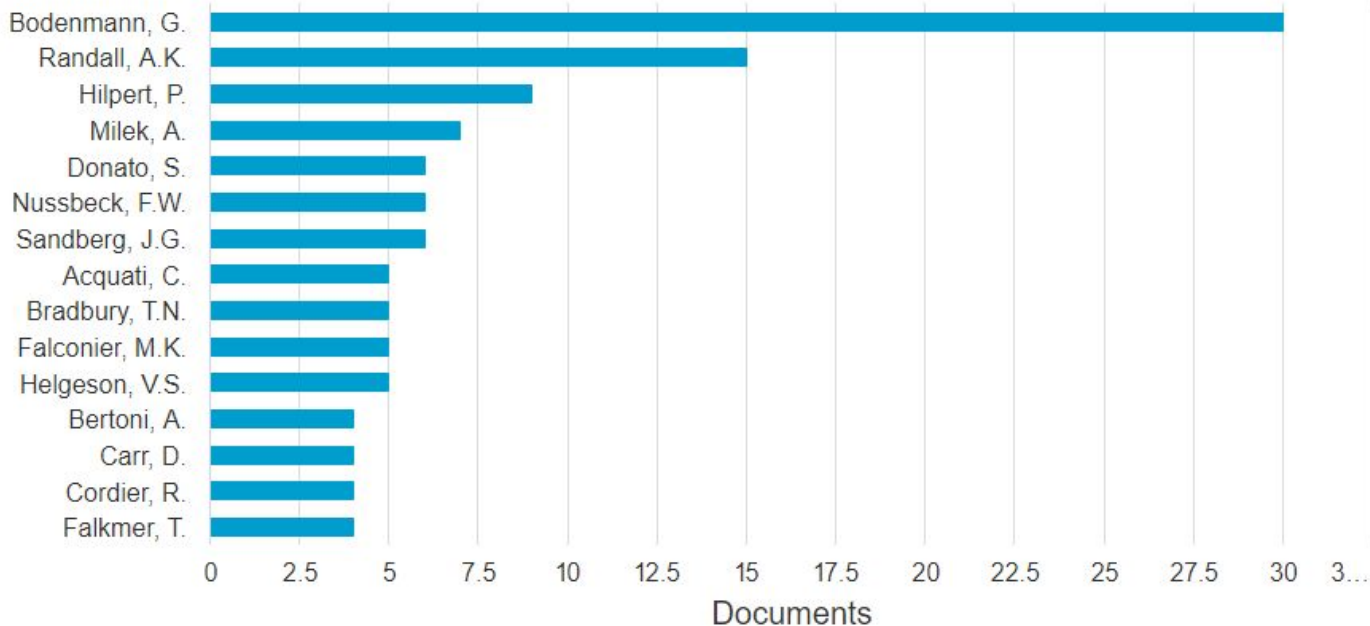
Initial Request & Response

◎ (A different) liaison librarian helped the faculty member with finding citing documents to his work in Scopus and Web of Science.

◎ This is the "yellow brick road" for citation analyses, the majority of requests and questions are typically satisfied by these databases & their features.

◎ However, for more comprehensive information and answers, multiple data sources, tools, and manual analytics are needed.

Initial Data & Response

Initially analyzed author data of citing documents using Scopus data

Documents by author

Compare the document counts for up to 15 authors.

Author	Documents
Bodenmann, G.	30
Randall, A.K.	15
Hilpert, P.	9
Milek, A.	7
Donato, S.	6
Nussbeck, F.W.	6
Sandberg, J.G.	6
Acquati, C.	5
Bradbury, T.N.	5
Falconier, M.K.	5
Helgeson, V.S.	5
Bertoni, A.	4
Carr, D.	4
Cordier, R.	4
Falkmer, T.	4

Documents

Breakdown of Scopus data

Scopus data imported to VOSviewer & exported to show influence and overlap of citing documents

Details about Authors that Cite the Faculty Member indexed in Scopus							
Data Sorted by First Column (Most Citing Author Descending)							
Author Name	**Number of documents by author that cite the faculty member**	**Citation count to author's documents**	**Average publication year for documents by author**	**Average number of citations to author's documents**	**Average normalized citation***	**Number of co-authors**	**Number of documents co-authored with other citing documents**
Author 1	27	253	2018	9.4	1.3	22	68
Author 2	12	84	2019	7.0	4.0	10	39
Author 3	11	46	2019	4.2	2.7	10	39
Author 4	11	48	2019	4.4	2.7	10	36
Author 5	11	62	2018	5.6	0.8	12	19
Author 6	7	146	2017	20.9	1.9	10	19
Author 7	7	46	2020	6.6	4.2	7	19
Author 8	7	45	2019	6.4	4.1	9	30
Author 9	7	33	2018	4.7	0.8	14	26
Author 10	6	26	2018	4.3	1.2	10	19
Author 11	6	23	2017	3.8	0.8	4	6

VOSviewer Density Visualization of Citing Authors

Legend

Size of the name/text number of publications that cite the author

VOSviewer Visualization of Co-Authorship Networks of Citing Documents

Legend

Size of the node
number of publications

Color of the node
average citation count received by publication

But…what about Google Scholar??

◎ Exported data directly from Web of Science & Scopus

◎ Exported data from Google Scholar via Publish or Perish

◎ Manually de-duplicated all records and re-ran analyses

◎ Scopus accounts for 319 citing documents, whereas GS accounts for 773

Comparison between Scopus and Web of Science documents that cite ████████████ (N=269)

34

41

194

■ Unique WoS Docs (compared to Scopus)
■ Unique Scopus Docs (compared to WoS)
■ Overlap of Scopus and WoS
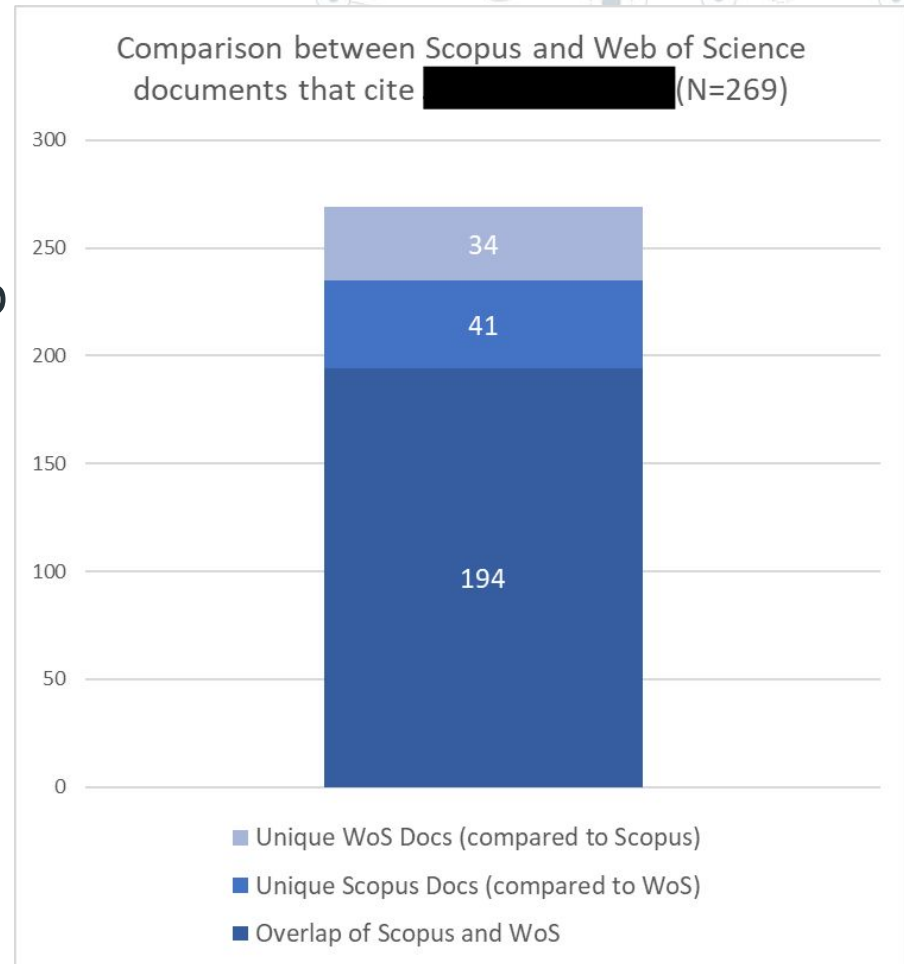
Comparison between Coverage of Documents across Scopus, Web of Science, and Google Scholar for English-only documents (left) and all languages (right)
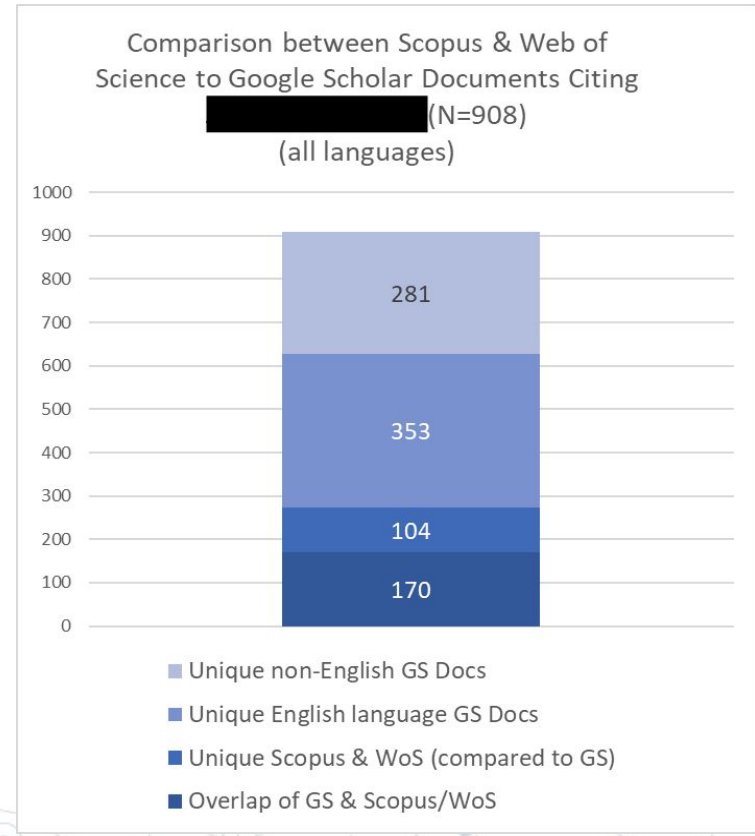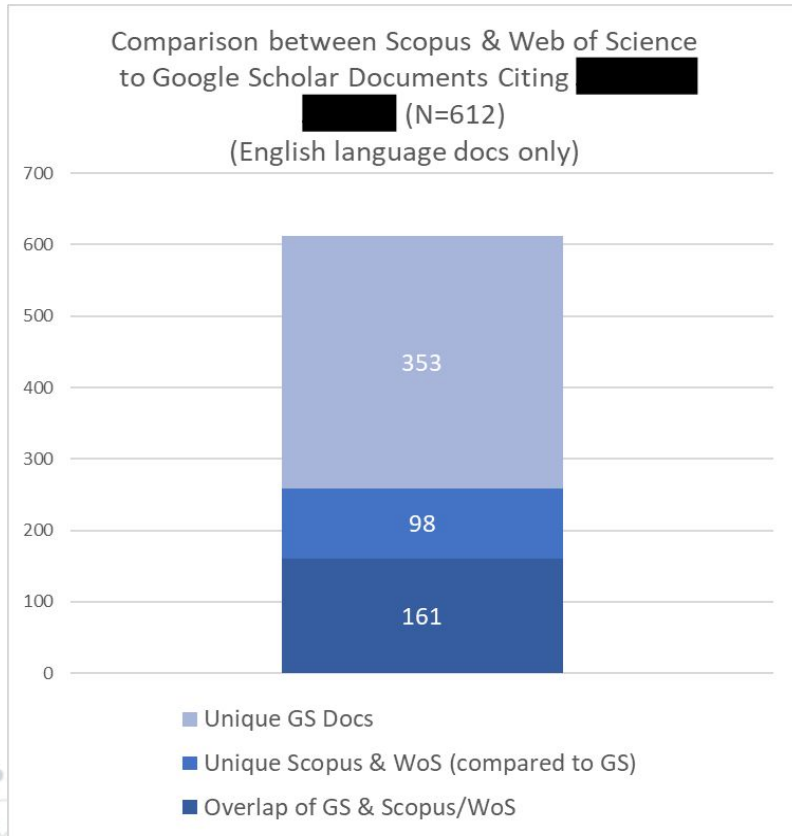
Aggregated Data from WoS, Scopus, & GS

	Citing Documents Aggregated from Web of Science, Scopus, and Google Scholar			
Author Name	Number of documents by author that cite the faculty member	Number of Citations Received by Citing Documents	Average Publication Year of Citing Documents	Average Number of Citations Received by Citing Documents
Author 1	38	420	2018	11
Author 2	25	253	2018	10
Author 3	13	220	2017	17
Author 4	11	226	2018	21
Author 5	11	66	2018	6
Author 6	10	527	2019	53
Author 7	9	75	2018	8
Author 8	9	60	2017	7
Author 9	8	52	2018	7
Author 10	8	85	2018	11
Author 11	8	47	2018	6
Author 12	7	44	2019	6

Master Spreadsheet of Citing Documents from Scopus, WoS, GS

Faculty member was able to use the data in the aggregated table and the master spreadsheet to search the names of the authors he was interested in, find the title of at least 1 work that cited him, and then look up the work and get their full name/affiliation and see if they are still at the same institution.

◎ Did searches for the author in the Author column
◎ Found documents that were relevant and important to him
◎ Found their affiliations to determine if they were at "sister institutions"
◎ Used this method to list external reviewers.

Follow-up Question:
Percentage of Citing Documents by Country

Faculty member wanted to know the percentage of citing documents by country to his most cited works, especially for GS data, since it includes more non-English language content. Made rough estimates of countries based on language of document.

Number of Documents by Country (rough estimate)
N=524, Source: Google Scholar

Citing Docs

199

0

16

1

3

7

3

199

184

1

1

7

1

1

1

1

22

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Group Analyses

Requests from Administrators for Colleges, Departments, Units

Research Analytics Support to 'College A'

December 2019 - Spring 2020

◎ Initial request from administrators for "capturing faculty publication data (journal articles, books, book chapters, etc.) over the past three years"

◎ Initially did offer support for using Elements, our research information management system

◎ Also offered support on exporting and analyzing data from Scopus, Web of Science, InCites, and SciVal

[SCOPE Process](#) for Measuring Responsibly

The five stages of SCOPE operate under **three main principles**:

1. Evaluate only where necessary. Evaluation is not always the right strategy.

2. Evaluate with the evaluated. Any evaluation should be co-designed and co-interpreted by the communities being evaluated.

3. Draw on evaluation expertise. We should apply the same rigour to our evaluations that we apply to our academic research.
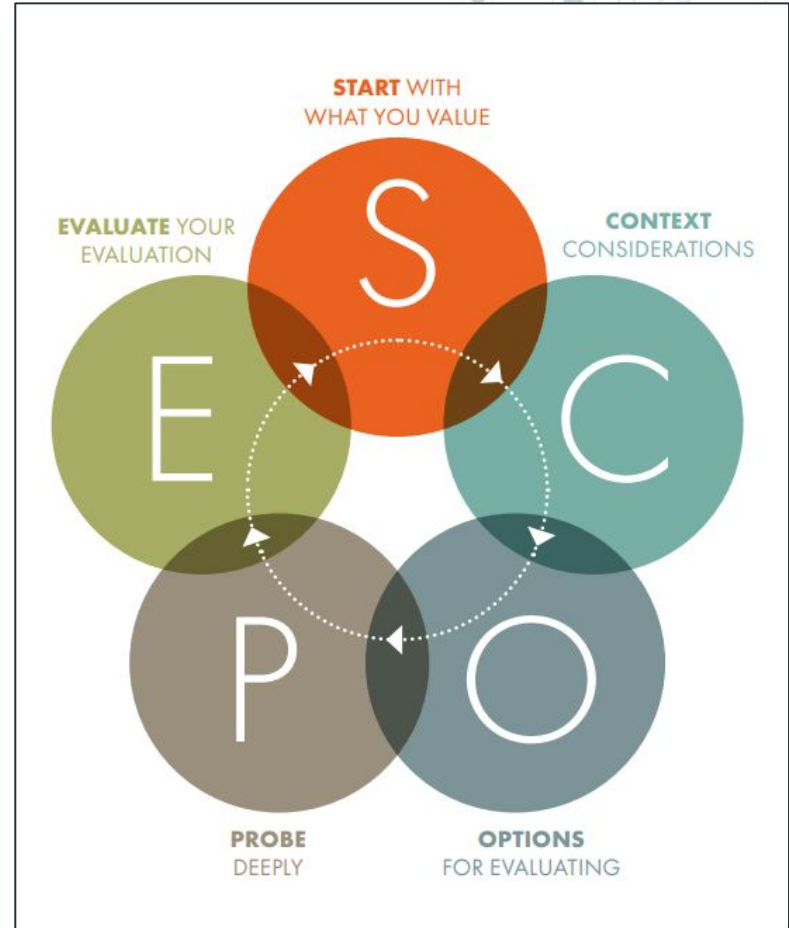
Follow-up Questions for Analytics Support to College A
SCOPE: START with what you value

Consider what you *want* to measure

- Scientific productivity and/or contribution
- Institutional trends in grant funding
- Economic impact
- Societal impact
- Research impact
- Journal publishing impact (can be useful for identifying future publishing strategy but not for a proxy of research impact)
- Something else?

Answers to Follow-up Questions for Analytics Support to College A

Consider what you want to measure:

◎ **Scientific productivity and/or contribution**
◎ Institutional trends in grant funding
◎ Economic impact
◎ Societal impact
◎ **Research impact**
◎ **Journal publishing impact** (can be useful for identifying future publishing strategy but not for a proxy of research impact)
◎ Something else? ***Emerging trends***

Follow-up question: "Yellow highlighting above indicates greatest interest. Out of curiosity, how would you measure societal and economic impact?"

(More) Follow-up Questions & Answers

Question: What do you value about the college's scholarship?

◎ Academic publications & citations measure academic influence and impact (roughly)

◎ There are other types of scholarship and impact; e.g., one faculty member primarily publishes reports, which are not tracked by bibliographic databases.

Answer: "We would value the reports, but we would need to separate them from peer-reviewed journal articles and book chapters (I would prefer to separate the latter as well)."

(Final) Follow-up Question - Altmetric Data

Question: I can also get some reports to you from Altmetric Explorer. AE measures the attention to research via news media, public policy, patents, social media, blogs, syllabi, and more. It can show more of the more public engagement with research.

Answer: This data would be of interest. It would help us understand how our communications team is performing, how our work is finding its way into public policy, etc.

SCOPE: **CONTEXT** Considerations

◎ Offer caveats and interpretations of bibliographic data, metrics, and graphs/visualizations

  ○ e.g., indicate ambiguity and looser interpretations of metrics when sample sizes are small; alternatively, do not include certain metrics when sample sizes are too small

◎ Cite literature where appropriate

◎ Meet with administrators to review impact reports and potential systemic effects of metric use (suggestions and caution for SCO**P**E: **PROBE** deeply)

We're off to see the Wizard!

Impact Report Provided to College A

Spring 2020

◎ Comprehensive bibliographic impact report provided to the college using Scopus and Web of Science data

◎ Some metrics and graphs also pulled from SciVal and InCites

◎ Graphs and visualizations created using combined data from Scopus & WoS; VOSviewer used to create network visuals

Overlap & Unique Documents with Scopus & Web of Science

Coverage and Overlap of Scopus and Web of Science Documents
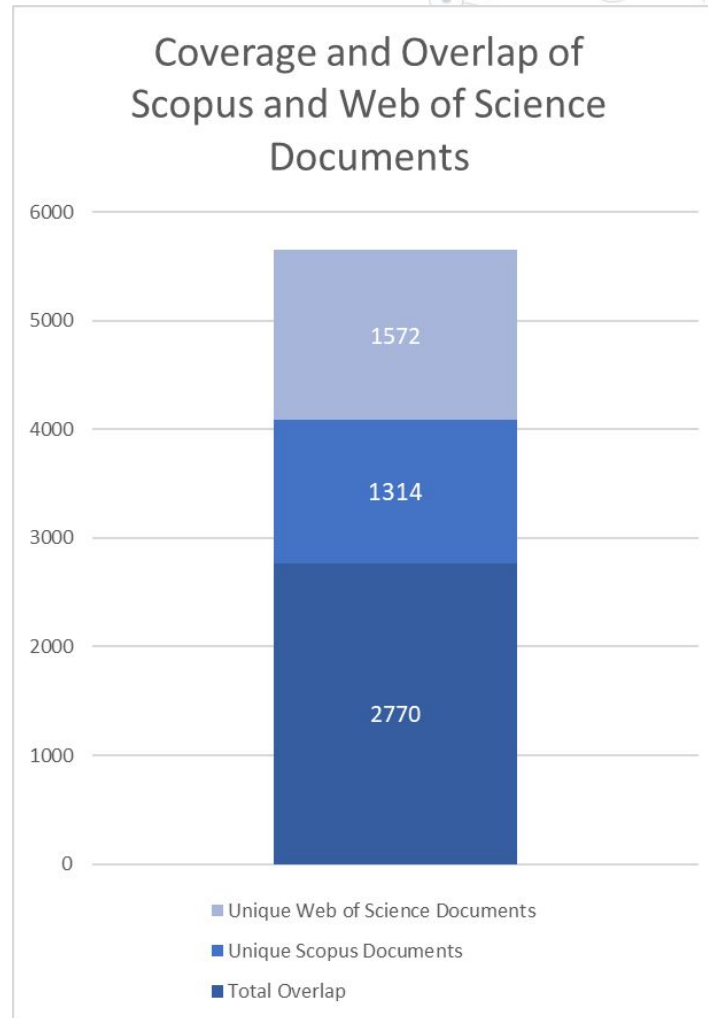
Coverage, Overlap, & Unique Documents by Department

Note that all departments except Department 4 have better coverage in Scopus than Web of Science.

Coverage and Overlap of Scopus and Web of Science Documents by Department
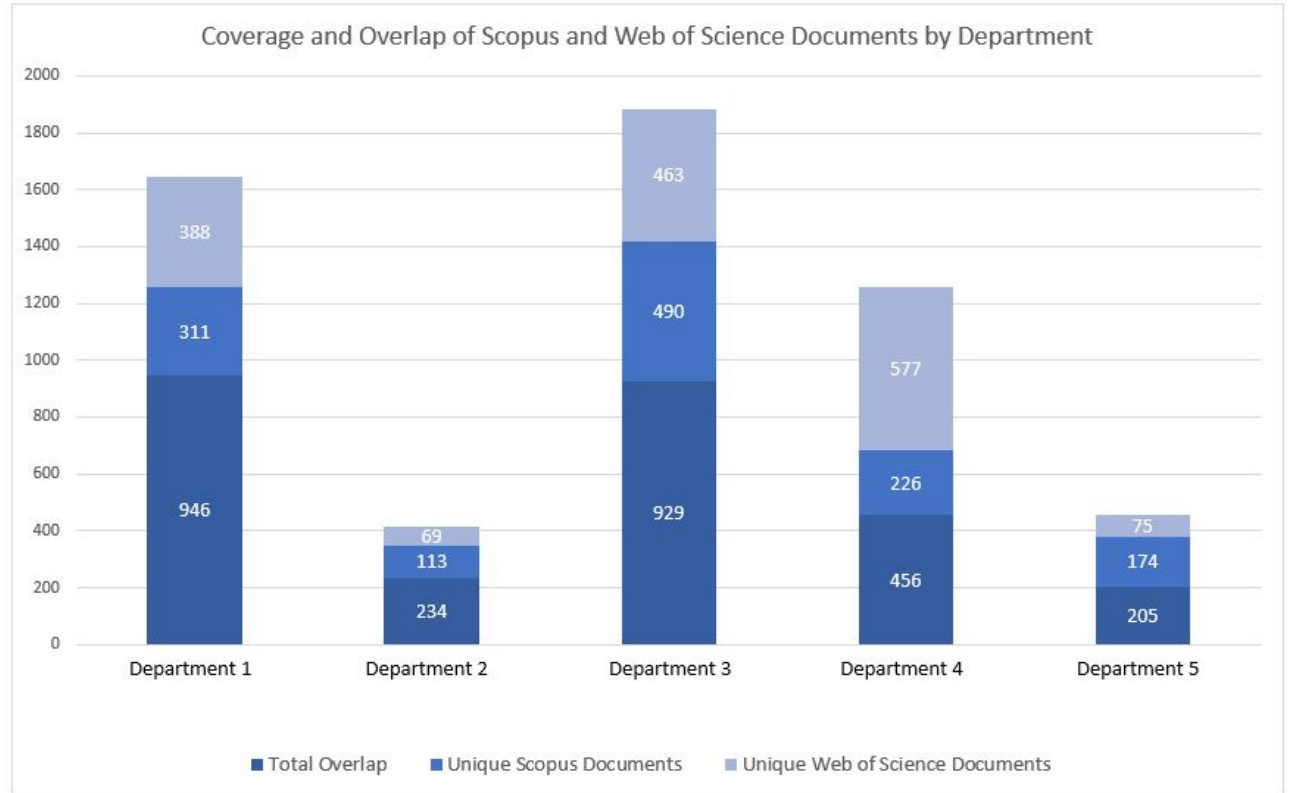
Who or what is the "man behind the curtain?"

In this metaphor...

The wizard could be:

◎ A bibliographic database

◎ A research analytics tool

◎ A university ranker

The the man behind the curtain could be:

◎ The source of the bibliographic data

◎ The source and calculation of the metric(s)

○ Strengths & weaknesses of metric(s), according to the bibliometric community

Transparency is Key

◎ Communicate research activity & impact data, its sources, interpretations, caveats

◎ Show the "wizard" conjured data as well as the "man behind the curtain"

○ The wizard still offers answers

○ The man behind the curtain offers explanations to the answers

Be Toto! *Bring attention* to the man behind the curtain

College's Interest in Elements

Spring 2021

◎ Pilot project began with College B to manually enter and import data into Elements based on information provided by faculty members

◎ Shared the project information with College A administrators during a meeting to discuss

◎ Explicitly asked, "If we want to gather the research publication data on faculty as comprehensively as possible, what is the best way to go about doing this?"

College A Elements Project Timeline: Gathering Information

Last spring/summer, 2021

◎ Faculty members from College A filled out Google form
  - ○ Faculty could include the following:
    - ◉ CV file or link
    - ◉ BibTeX file of scholarly works
    - ◉ Links to scholarly profiles & professional websites
    - ◉ Bios, research statements, and teaching statements
    - ◉ Name variations

College A Elements Project Timeline: Importing & Entering Data in Elements

Fall 2021 - present

◎ Students hired and trained to use Elements, Zotero (or another reference manager), Publish or Perish, and enhance their search skills

◎ Documentation & training videos created; two sections, twelve steps total:

- ○ Section 1: Setup & Updating Elements Profile
- ○ Section 2: Verify & Add Scholarly Works

College A Elements Project Wrap-Up

◎ Scheduled to finish importing / entering data into Elements by end of summer 2022

◎ Begin pulling reports on faculty activity data in fall 2022; compare that to previous impact reports

◎ Much of the "extra" data entered in the system is considered non-traditional research outputs, such as:

○ Reports, presentations, conference papers & abstracts, software

Preliminary Data Report from Elements

College A Scholarly Works in Elements for 37 Completed Faculty Profiles, 2012 - 2022	
Research Output Type	**Number of outputs**
Book	21
Book chapter or section	72
Conference paper or presentation	765
Dataset	4
Design	5
Exhibition	15
Internet Publication	26
Journal article	1028
Media Product	27
Numbered extension publication	11
Other	36
Patent	4
Poster	81
Preprint	4
Presentation (not at a conference)	184
Refereed journal article	656
Report	125
Software / Code	5
Total	***3069***
Compared to SciVal Total *includes articles, books, book chapters, reviews, conference papers*	***863***

Looking to the Future

Assisting with defining research impact?

Assisting units/departments/colleges with following SCOPE process?

Seeking Definitive Answers to Ambiguous Questions

◎ What is the "**impact**" of a college / department?

  ○ Is it a metric?

    ◉ If so, which metric? Field-weighted citation impact? Number of citations? Number of publications?

  ○ Is it a series of metrics and qualitative measures?

  ○ Importantly - *who* is asking and why?

Returning "home" to our values

Thank you!

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