National Open Science Research Analytics in VIVO

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Part of the OPERA project – Open Research Analytics

Danish project with international partners

Funded by

Ministry of Higher Education and Science
OPERA - in brief

In the OPERA project we:

**Explore and review:**
- Opportunities and barriers to include Open Science and Open data in research analytics
- Metrics
- Systems
- Software
- Code
- Tools for visualization and analysis
- Indicators for Impact assessment

**Identify:**
- the most relevant and promising indicators for data sharing and Open Science

**Examine:**
- relevant quantitative indicators for the societal impact of research in the humanities and social sciences

**Develop:**
- Research analytics systems with Open:
  - Metrics
  - Systems
  - Software
We want to move from talking…
...and start experimenting
National open science research analytics: Pilot based on Dimensions++ data

With data from all Danish universities & university hospitals

In order to identify & understand some of the many aspects, patterns, impact and potential of the Danish research landscape

And to compare on an international level

While making the system openly available
Primary data sources

- DIGITAL Dimensions
- neo4j
- VIVO
- The Bibliometric Research Indicator
- Danish Indicators
- Open Access Indicator

Open Science elements

- Unpaywall
- Publons
- DataCite
- figshare
Why did we choose Dimensions as the primary source?

• Opportunity to test and dive into an alternative to the established citation databases
• From a data provider with a more open approach to data, sources, methods
• ...and a less traditional view of research output and its impact
• A lot of potential collaborating with Digital Science
• Most of all because we find Dimensions data to be promising and of good quality → based on comprehensive testing
Three-step Approach to the Dimensions Test

In order to understand Dimensions coverage of the Danish universities, the data quality, data gaps, potential and challenges

1. Initial, unstructured test of data and functionality
2. Structured test focusing on coverage
3. In-depth comparison of data on publication level in Dimensions and Web of Science

Results discussed with Digital Science
What we envision: Optimized data

Working with Digital Science to make sure

• The data is complete for Denmark
• Correctly reflects the affiliation to Danish universities
  – And Danish university hospitals
• Correctly reflects Danish funders and grants

Benefitting (hopefully) from Dimensions’ article level subject classification ...

• Having been very dissatisfied with the journal level classifications of the traditional databases ...

... and the wider array of data types: Grants, Patents, Clinical trials, Policy documents
What we envision: Analytics of the DK universities

Looking very much at the Leiden Ranking as a source of inspiration.
CWTS Leiden Ranking 2019

The CWTS Leiden Ranking 2019 offers important insights into the scientific performance of nearly 1000 major universities worldwide. Select your preferred indicators, generate results, and explore the performance of universities.
What we envision: Analytics of the DK universities

Looking very much at the Leiden Ranking as a source of inspiration.
And adding other analytics, inspired by Dimensions itself and Digital Science reports, like:
What we envision: Analytics of DK in the world

Comparing Denmark with
• Global and regional (Europe, EU etc.) baselines
• Other countries (selected)
What we envision: Open Science metrics

Time for open science skills to count in academic careers!

How can academic rewards systems better recognize the work to make science open, and encourage researchers to develop the right skills?
What we envision: Open Science metrics

What we envision: Open Science metrics

Open Science Career Assessment Matrix

• **Research output**
  – Research activity
  – Publications
  – Datasets and research results
  – Open Source
  – Funding

• **Research process**
  – Stakeholder engagement / citizen science
  – Collaboration and interdisciplinarity
  – Research integrity
  – Risk management

• **Service and leadership**
  – Leadership
  – Academic standing
  – Peer review
  – Networking

• **Research impact**
  – Communication and dissemination
  – IP (patents, licenses)
  – Societal impact
  – Knowledge exchange

• **Teaching and supervision**

• **Professional experience**
What we envision: Open Science metrics

- Nature 508, 312–313 (17 April 2014) doi:10.1038/508312a
What we envision: Open Science metrics

The 14 roles of the CRedit taxonomy

1. Conceptualization  8. Resources
2. Data curation      9. Software
3. Formal analysis   10. Supervision
4. Funding acquisition 11. Validation
5. Investigation     12. Visualization
6. Methodology       13. Writing – original draft
7. Project administration 14. Writing – review & editing

And Peer Reviewing?
What we envision: Open Science metrics

- We can do **Open Access** fully (Unpaywall & Danish OA Indicator)
- We can do **FAIR Data** to some extent (DataCite & Figshare)
- We can do **Peer Reviewing** to some extent (Publons)

- But to generate exemplar profiles with full Open Science coverage - before the end of next year

- We will have to work with researchers that are Open Science champions, and manually curate the necessary metadata.
Network analyses & visualizations

In order to complement the more traditional analytics and visual elements and to support new ways of perceiving numbers, patterns and potentials.
Knowledge Landscape - across and beyond silos

Map of Science DK - English 2015-2017
Copenhagen university

Capability mapping: using bibliometric data to explore the potential of research ecosystems - @parraguezr
Knowledge Landscape - across and beyond silos

Map of Science DK - English 2015-2017
Technical University of Denmark

Capability mapping: using bibliometric data to explore the potential of research ecosystems - @parraguezr
Calculating collaboration deltas - Across and beyond silos

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Example collaboration matrix
Calculating collaboration deltas - Across and beyond silos

Actual interaction

Interaction “potential”

DELTA MATRIX

CD: Collaboration deficit
CS: Collaboration surplus
Project timeplan

- Analyze sources of Open Science elements
- Load, test and adjust data
- Add analytics and Visualizations
- Protype ready for VIVO Conference 2020
- End of the OPERA project

September 2019 — December 2020
Getting a lot done quickly with the Dimensions API

Dimensions API examples on Github
https://digital-science.github.io/dimensions-api-lab/

What does a University Look Like Project:
Thank you for your attention!

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