Academic Profile, Network and Collaboration Analysis

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What I am talking about...

- Introduction
- Profiles: What and who is it for?
  - Types and examples
  - Institutional needs
- Research Information Network at Cambridge
- VIVO & Network analysis (internal data provision)
- Research Capability maps (external data provision)
The University of Cambridge

• One of the world’s leading academic centres and oldest universities
• Mission: to contribute to society through the pursuit of education, learning and research at the highest international levels of excellence
• UK and Europe’s leading research university
• 12,000 undergraduate and 7,000 postgraduate students
• 10,000 staff
Wastl, Juergen
Dr

Positions

Head of Research Information, Academic Division, Research Strategy Office, University of Cambridge 2014 -

RAE/REF Officer, Academic Division, University of Cambridge 2007 - 2014

Overview

I currently head the Research Information team at the Research Strategy Office with responsibilities for managing and implementing software tools for Academics and Administrators (Symplectic, Altmetric, Dimensions, Research Professional, ORCID) and provision of analysis (including network and collaboration analysis) for Collegiate Cambridge
Profiles: Where does the data come from?

Add picture and contact details

Use the tabs to jump to a section

Add an introductory overview

Add labels

Direct links to external profiles and websites

Links to Cambridge co-authors
Wastl, Juergen

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An institutional Profile: Who is interested?

- Media
- Public
- Academics
- Funders
- Government
- Industry/private sector
- Students (incl prospective ones)
An institutional Profile: Interest in what?

- HEI
- research outputs
- rankings
- impact
- patents
- teaching
- employment
- Spin-offs
- grants
- reports
- University of Cambridge
One way of looking at a profile...
One way of looking at a profile...
One way of looking at a profile...

Where is your Institution?

arts

applied

science

theoretical/basic
One way of looking at a profile…

Where is your Institution?

artstheoretical/basicapplied

Would you compare these Institutions?
….another way: Fingerprinting (after Research assessment)

**Research Fingerprint**

- **2567 Funded Projects**
- **2196 Academic Staff**
- **5184 PhD’s Awarded**
- **3.29 GPA**

The University of Cambridge has the most funded projects in 4 UoAs and the second most funded projects in 7 UoAs among sector 1 institutions.

The University of Cambridge has the most staff in Physics and the second most staff in 11 UoAs among sector 1 institutions.

The University of Cambridge has the most awarded PhDs in 5 UoAs and the second most awarded PhDs in 6 UoAs among sector 1 institutions.

The University of Cambridge has the highest score in 5 UoAs and the second highest score in 6 UoAs among sector 1 institutions.

Leading to the following questions:

- Are Departmental boundaries still valid?
- Focus on Individual, Research group, Research Centre, discipline?
- Inter- or multi-disciplinary?
Leading to the following questions:

- What is the base unit of a Research Profile?
- Which categorisation scheme?
- Grant, publication or Research interest?
Leading to the following question:

• How to break up boundaries?
Possible solutions

• Linked Open Data
• Visualisation of knowledge graph
• VIVO
• Research Topics Map (research capability map)
An institutional Profile?

Discover Cambridge Connections

Welcome to the University of Cambridge VIVO. VIVO is a research discovery tool, containing publicly available information, which can be used to find people, projects and publications across all disciplines of the University.

This demo version is protected by Raven. Please send any feedback and ideas for future development to vivo@admin.cam.ac.uk

Examples of bootstrap VIVO
VIVO is...

- An open source Research Discovery tool
- Linked Open Data
- Huge effort when manually maintained
- Adjustable to what we want it to be
VIVO is not:

• replacement for Departmental websites

• ‘stand alone’ or another individual profile (e.g. academia.edu; Researchgate; Google Scholar or other subject specific profiles)
VIVO can:

• Increase the visibility of Cambridge Research
• Map and display Cambridge Research (OA, Open Data)
• Drive traffic to Departmental websites
• Assist with linking Institutions and Centres
• Facilitate network analysis within the university and with other HEI
VIVO: Map of Science

Map of Science

- Maps publications against disciplines (13) and sub-disciplines (554)
- Based on individuals, groups, and departments
T Department of Engineering

Explore activity (9,858 publications) across 554 scientific subdisciplines

- Explore T Department of Engineering
- Compare organizations

37.49% of 26,292 publications mapped

554 Subdisciplines | 13 Disciplines

Save All as CSV
Strengths and weaknesses

• Efficient: re-use of existing data

• Academic buy-in (opt in? or opt-out?)

• Data quality
  • VIVO exposes data gaps

• Data mapping
  • What is it that you want to display?
  • Who is your target audience (general public, prospective PhD students, media, researcher (internal vs external)?)
Finding expertise and exploring networks
Cambridge Approach

• Network of Research Information

• Historic: gather publications (2010) for Research Assessment and mandatory reporting

• Move from data and information gathering (and reporting for REF) to research management

• From information … to intelligence?
Reactive approach

- Driven by reporting requirements
- **Collection** of meta data
- Retrospective
Linked data in Elements (January 2017)

- **Linking** meta data
- **Networks** of data
- **Prospective**
From integration to innovation or:
from reactive to proactive

https://figshare.com/articles/Mind_the_Research_Information_Map/1507607
https://figshare.com/articles/Evolution_of_Mind_the_Map_of_Research_Information_/1581472
Profiles: Where does the data come from?

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Use cases...

• Network and collaboration analysis within the Institution,

• Analyse links with external institutions

• Visualisations
Visualisations : ORCID

More visualisations of networks and collaborations
This shows collaborations between REF2014 UoAs; indicating that interdisciplinary research is already a key element of research practice at Cambridge.

When combined with contextual knowledge from research support staff (with specialist area knowledge) we can use this type of insight to:

• Provide introductions between researchers with similar interests.
• Model which topics lend themselves to extensive or intensive groups.
• Identify individuals who may be ready to collaborate on a bid.
• Help researchers to navigate an evolving research environment.

http://dx.doi.org/10.6084/m9.figshare.1431829
Innovation: finding connections

Colours indicate University departments. Points or nodes represent researchers. Connections or edges represent an instance of co-authorship.

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It is possible to explore the connections between members of a defined group and consider not only the direct connections between them (through collaboration or publication), but who their collaborators collaborate with, and what other connections they may have made.

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Collaboration Analysis between HEIs

- Cancer Research collaboration analysis Cambridge and Oxford
Use cases: pretty

Helps researchers and departments by making “shiny things”.

Hard Benefits:
- Promotional materials
- Agnostic of prior knowledge

Soft Benefits:
- Academic buy-in
- Allows exploratory conversations
Use cases: persuasive

Where work is interdisciplinary, considering connections can be an indicator of a successful initiative…
Use cases: Departmental boundaries

Gives a mechanism to structure a conversation:

“Are Victorian departmental structures still relevant/useful/viable?”

Modularity offers one way of talking about common characteristics.
Meta-interdisciplinarity: putting it all together

- Mediated matchmaking?
- Mentoring partnerships?
- Clear the blockage?
- Spread the skillset?
- Academic families?
- Combining with unstructured data techniques?
An Institutional Research Profile
An institutional Research Profile

Co-authorship analysis

Research domain expertise

HEI

collaboration

Disciplinary analysis
An institutional Research Profile

- Co-authorship analysis
- Research domain expertise
- Internal Curated Data
- Disciplinary analysis
- Collaboration
Research Capability maps

- Increased need for comparison with other HEI
- Benchmarking
- Assessment

- External data?
  - Curation? (staff, awards in particular)
Cambridge Research Capability map

Research Topics Map: rtopmap
Overlay with Dept of Engineering

Research Topics Map: rtopmap
Overlay Dept Geography

Research Topics Map: rtopmap
Computer Lab

Research Topics Map: rtopmap
Computer Lab - connections

Research Topics Map: rtopmap
Dept Chemistry vs Dept of Biochemistry

Research Topics Map: rtopmap
Institutional Comparisons?

- Oxford
- Cambridge
- Melbourne
- Imperial
Summary

- No single way of a Research profile for an Institution
- Driven by internal and external factors
- ‘Profiling’ is a hot topic with clear alternatives based on strategy and development effort
- VIVO: linked open data research discovery tool
- Capability maps
- Pressing need for visualisations of institutional knowledge graphs
Thank you very much for your attention.

Questions?