



Research Analytics Strategy in a Leading Research Intensive UK University

Dr Giles A F Carden

Consultant Director of Product Strategy – Thomson Reuters



THOMSON REUTERS

Outline

- University of Warwick – a recent history
- The research lifecycle
- Research performance dimensions: inputs, outputs and impact
- Research analytics, strategy and performance
- The evidence base
 - Bibliometrics
 - Research income
 - Research student numbers
 - Impact
- Concluding thoughts

The University of Warwick

A Recent History

The University of Warwick

Historical Context

1964-65

The University of Warwick **opens**, taking its first cohort of 450 undergraduates when it received its Royal Charter in 1965.

2000

The University establishes its **Medical School** and **Warwick Ventures Ltd** which has helped launch 60 companies since its inception.

2008

University ranks 7th overall in the **UK Research Assessment Exercise (RAE)**

2013

The £92m **National Automotive Innovation Campus** commences, jointly funded by the UK Government, Jaguar Land Rover and TATA Motors.

2014

University ranks 7th overall in the **UK Research Excellence Framework (REF)**

2015

Long established as one of the UK top ten research intensive universities with **major global alliances** and corporate relationships. Campus of 400 hectares hosting over 23,000 students and 5000 staff drawn from 120 countries across the globe. January 2015 advances plans for a campus in California.



THOMSON REUTERS

The University of Warwick Partnerships and Alliances



National Automotive Innovation Campus (NAIC)

£100m joint enterprise between:

- Jaguar Land Rover
- TATA European Technical Centre
- Warwick Manufacturing Group/ The University of Warwick
- UK Government
- Growing network of supplier companies

Due for completion in 2016



The University of Warwick Partnerships and Alliances



MONASH
University

Warwick – Monash alliance launched to collaborate on research, education and enhancing the experience of its students.



2011

Strategic partnership with the Liverpool School of Tropical Medicine (LSTM) announced to support joined up long –term research, focusing on improving quality of health and social care and influencing policy and practice.



CENTER FOR URBAN
SCIENCE+PROGRESS

University of Warwick is selected as CUSP's sole European partner for the New York based initiative involving NYU, Carnegie Mellon, CUNY, Indian Institute of Technology in Bombay, University of Toronto and a number of industrial partners including IBM, Microsoft, Cisco and Siemens.



2012

2014

Warwick signs memoranda of understanding with Sun Yat-Sen University strengthening its relationships with Chinese institutions and providing new study opportunities for students.



THOMSON REUTERS

The University of Warwick Sacramento, California, USA



- Placer County, near Sacramento.
- Funded by the University Development Trust.
- 600 of the 1,159 acres it received as a donation in December 2012 from Angelo K. and Sofia Tsakopoulos, William and Claudia Cummings and the Wayne L. Prim Family.
- Small but comprehensive university in 10 years.

The University of Warwick Vision 2015 Strategy

July 2006

Professor Nigel Thrift appointed Vice-Chancellor & President with an ambitious drive to improve research performance launching the overarching strategy Vision 2015 in 2007.



Vision 2015 Goal 1:

To make Warwick an undisputed world leader in research and scholarship.

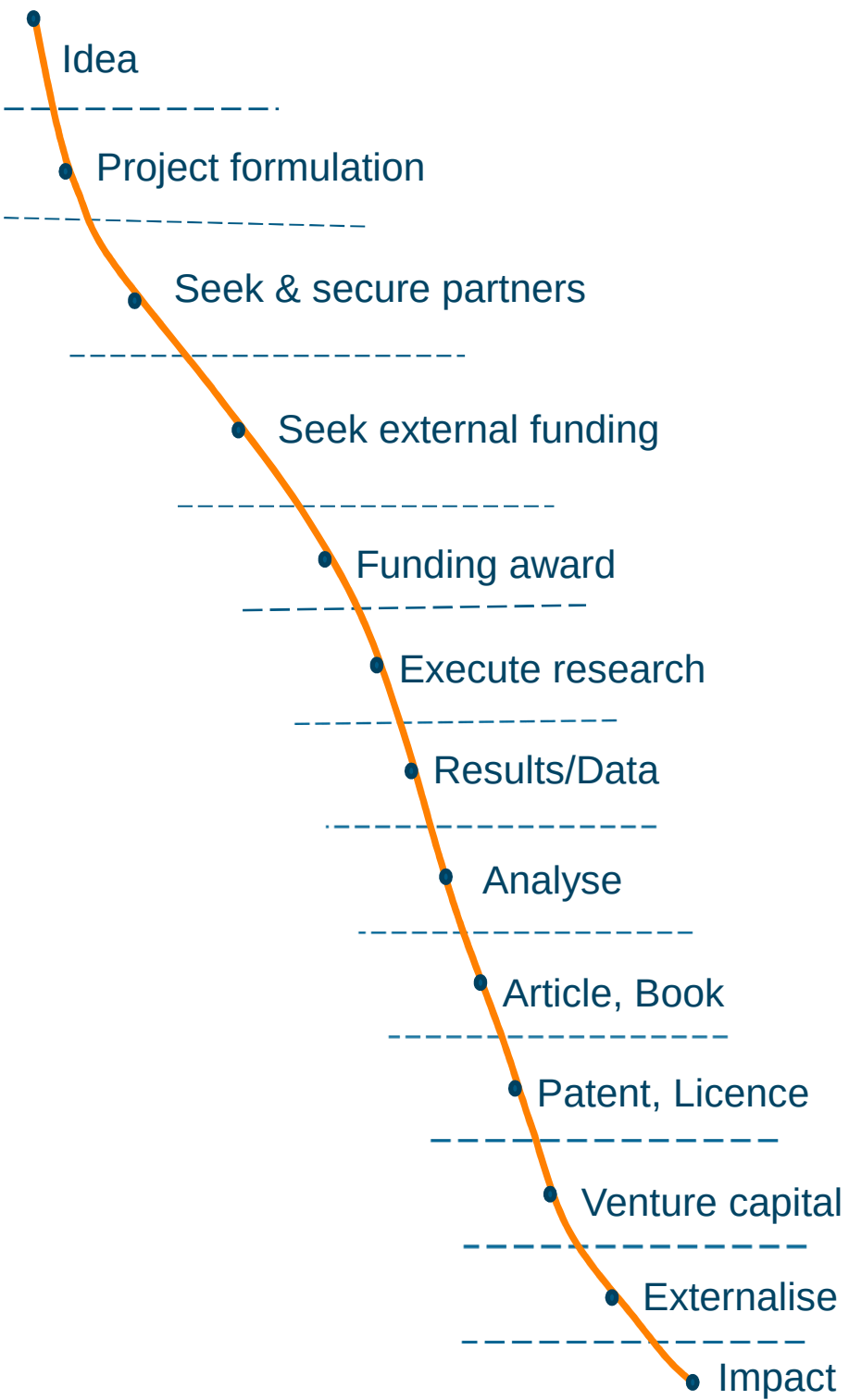
Our commitment to be demonstrably a centre of world class research and innovation across all of our academic disciplines remains as strong as it always has been. This means that we must maintain our focus on the quality and impact of research and ensure that we are embedding our quality expectations in our internal processes, in particular those to support and develop existing staff and in the appointment processes when we seek to recruit new talent.

Research Performance

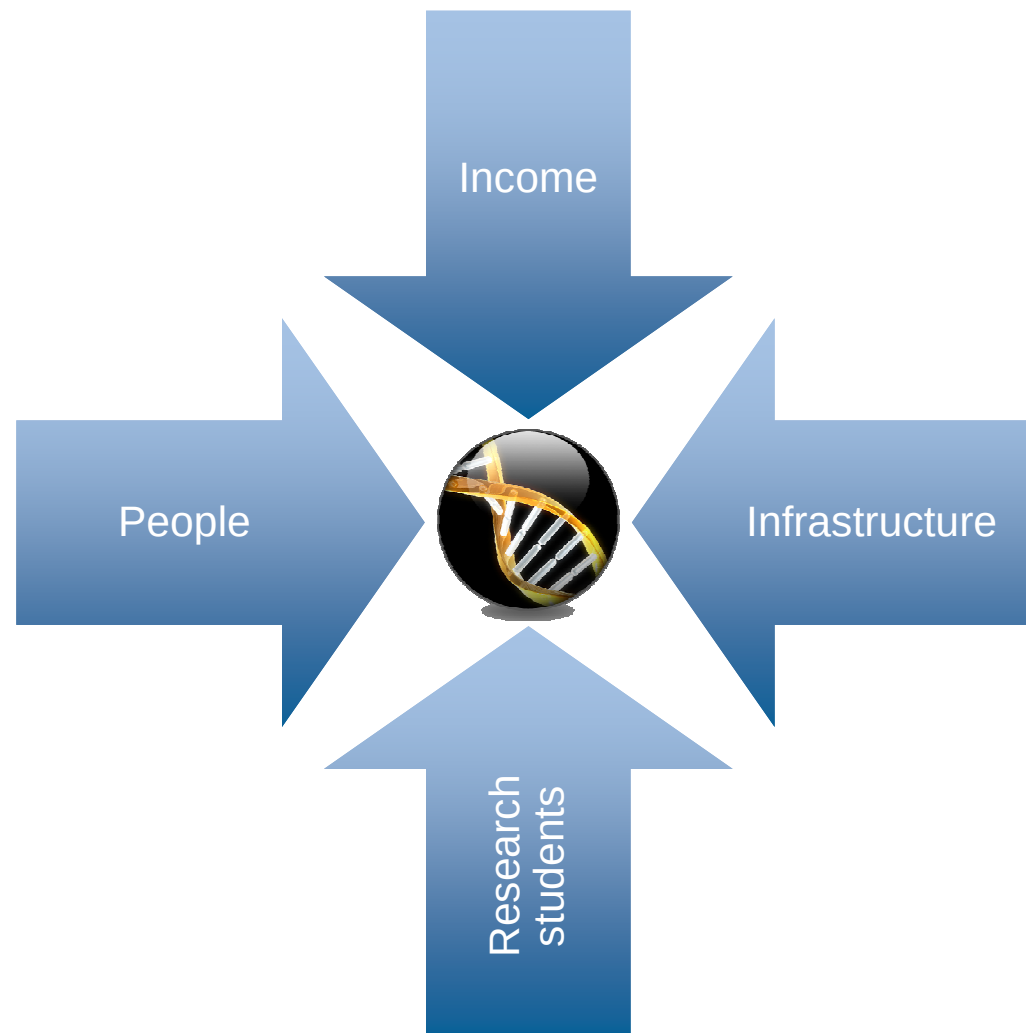
The Research Lifecycle



THOMSON REUTERS



Research Performance Inputs

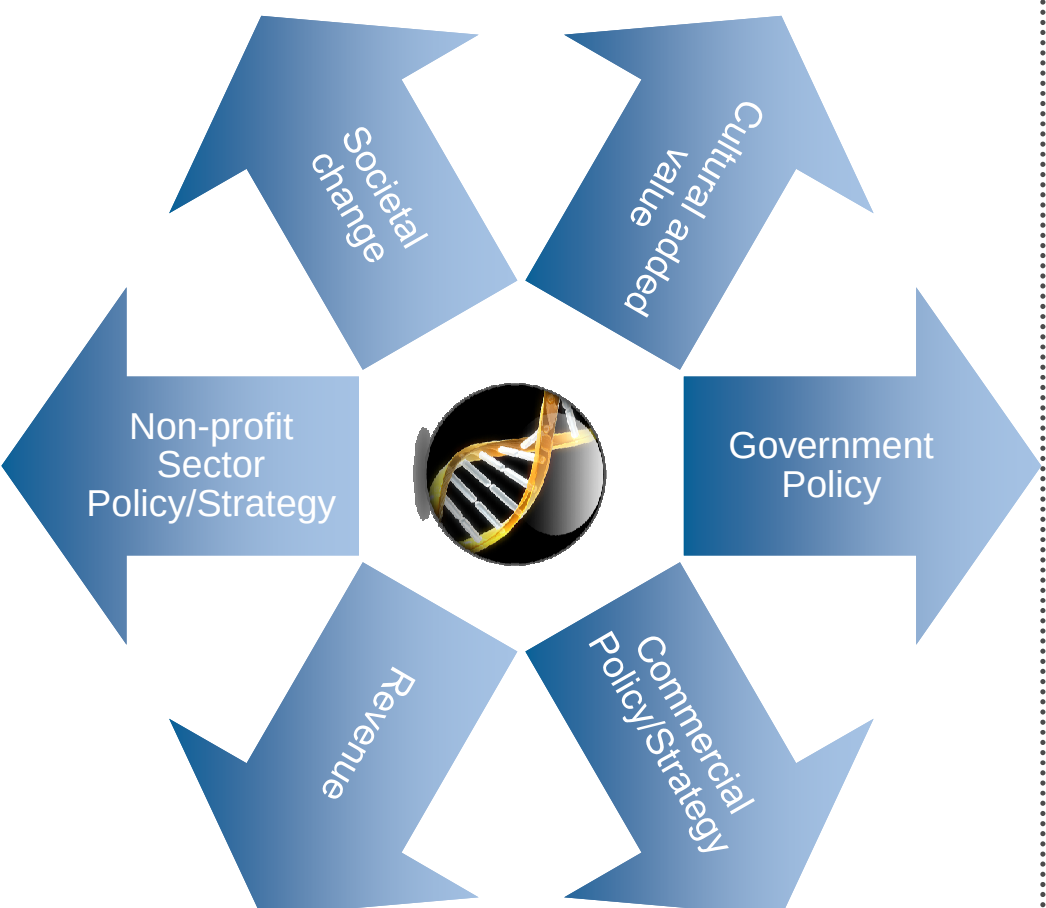


Research Performance Outputs



THOMSON REUTERS

Research Performance Impacts



Research Analytics and Strategy

Research Analytics and Strategy

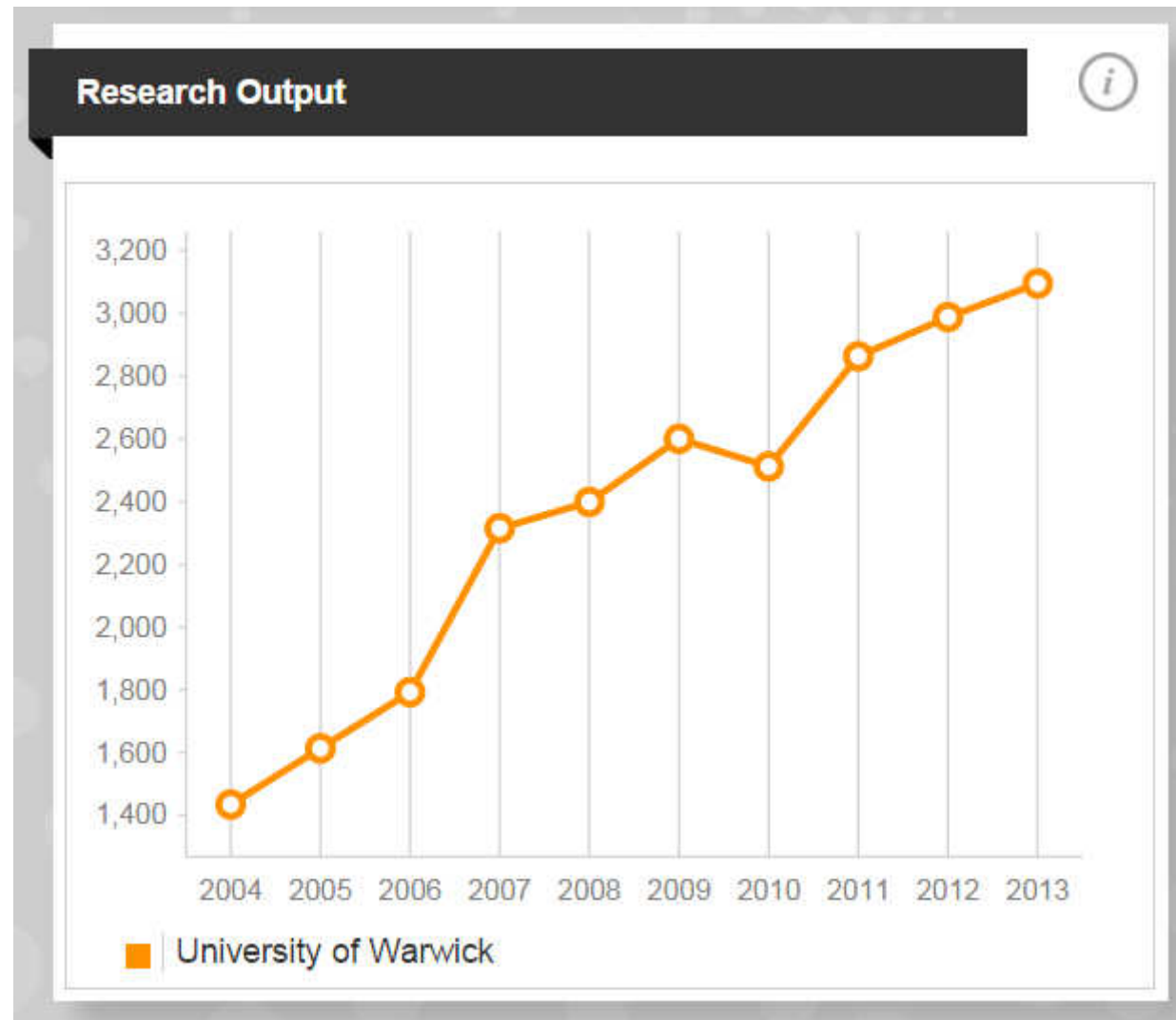
- Bibliometrics - most comprehensive way of benchmarking and measuring the principal outputs of research.
- Measure and benchmark across 251 subject fields in WoS core data set or at higher levels.
- Assess the influence of your research outputs.
- Use journal impact factors (JIFs) to establish most influential journals in subject fields.
- Inform strategies to optimise citations' count and reputation.

Research Analytics and Strategy

- Competitor analysis.
- Benchmark and baseline your research to world standards.
- Understand the global reach of your research.
- Analyse collaboration networks.
- Develop publications strategies.
- Help inform hiring strategies.
- Help inform reward and remuneration strategies.
- Impact world rankings.

Research Analytics and Strategy

University of Warwick
productivity between
2004 and 2013



Research Analytics and Strategy

	Name	Rank	▼ Web of Science Documents	Normalized Citation Impact	% Documents in Top 10%	% Industry Collaborations
☐	ASTRONOMY & ASTROPHY...	1	1,130	1.59	11.86%	0.71%
☐	ECONOMICS	2	999	1.77	11.71%	0.4%
☐	MANAGEMENT	3	826	1.3	9.69%	0.73%
☐	...	4	781	2.44	10.63%	0%
☐	BIOCHEMISTRY & MOLECU...	5	716	1.29	11.45%	1.26%
☐	CHEMISTRY, MULTIDISCIPL...	6	708	1.29	13.14%	2.26%
☐	CHEMISTRY, PHYSICAL	7	696	1.27	11.78%	0.72%
☐	PHYSICS, MULTIDISCIPLIN...	8	639	2.81	25.67%	0.16%
☐	MATERIALS SCIENCE, MUL...	9	631	1.26	14.26%	0.16%
☐	ENGINEERING, ELECTRICA...	10	621	0.86	7.89%	1.77%

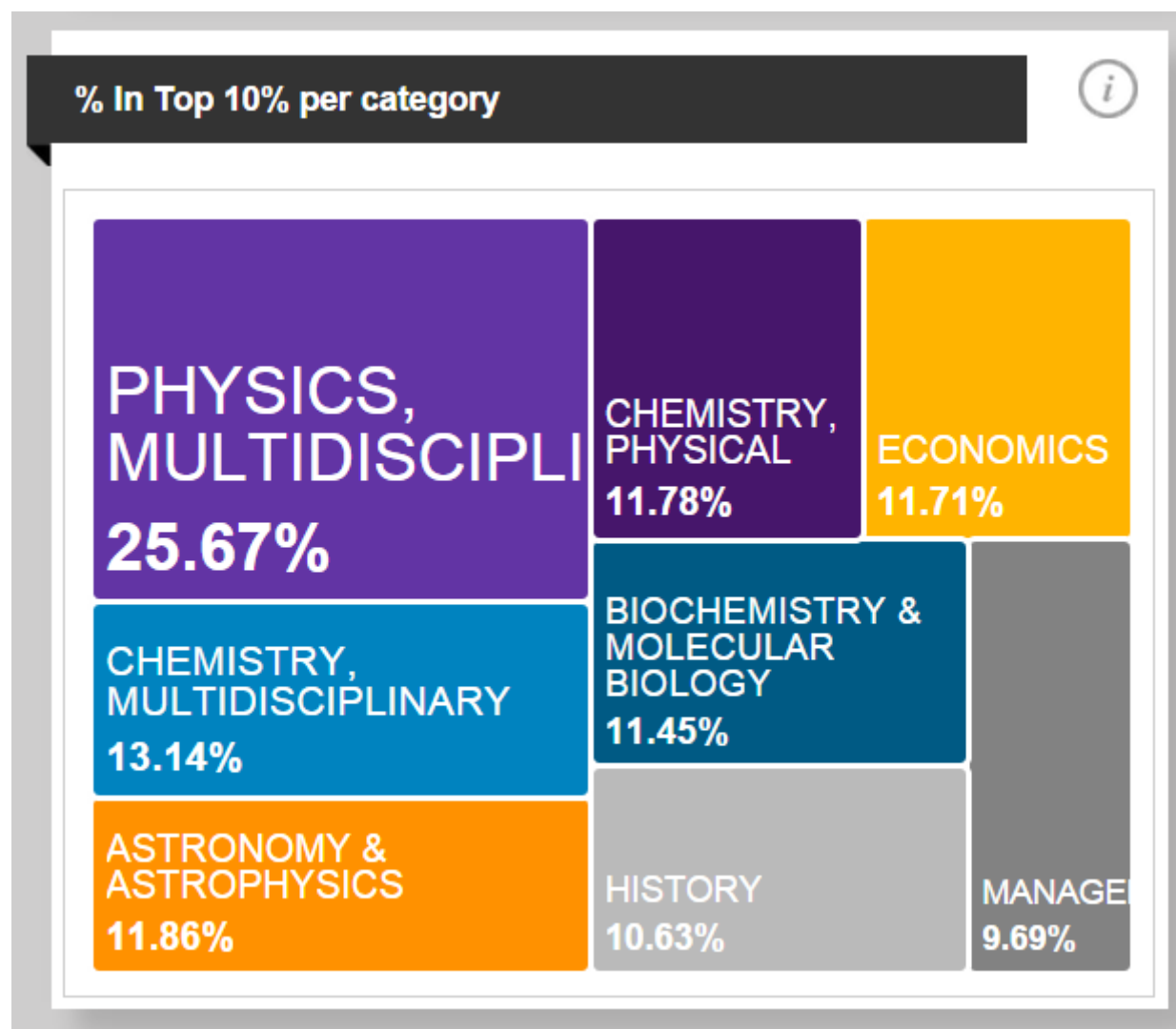
Disciplinary strengths



THOMSON REUTERS

Research Analytics and Strategy

Assess influence:
% of Top 10% articles
in Specific disciplines



Research Analytics and Strategy

Compare Selected Journals	Add Journals to New or Existing List		Customize Indicators	
Full Journal Title	Journal Impact Factor ▼	Impact Factor without Journal Self Cites	Cited Half-Life	Eigenfactor Score
ALDRICHIMICA ACTA	16.333	16.333	6.5	0.00243
NATURAL PRODUCT REPORTS	10.715	10.234	6.1	0.01728
	6.324	5.580	5.2	0.17842
	5.788	5.271	5.8	0.05213
ADVANCED SYNTHESIS & CATALYSIS	5.542	5.161	4.6	0.04346
Topics in Organometallic Chemistry	5.293	4.793	3.8	0.00318
BIOCONJUGATE CHEMISTRY	4.821	4.601	5.9	0.03021
JOURNAL OF ORGANIC CHEMISTRY	4.638	4.143	>10.0	0.11241

Journal Impact Factors:
most influential journals



THOMSON REUTERS

Research Analytics and Strategy

Rankings indicators



Gained 54 places in 3 years



THOMSON REUTERS

Evidence Base

Evidence Base Bibliometrics

- Volume of articles / books / monographs
- Count of articles in key high JIF journals e.g. Cell, Nature family, Science, NEJM etc.
- Subject field normalised citations' count per paper, per researcher, groups of researchers

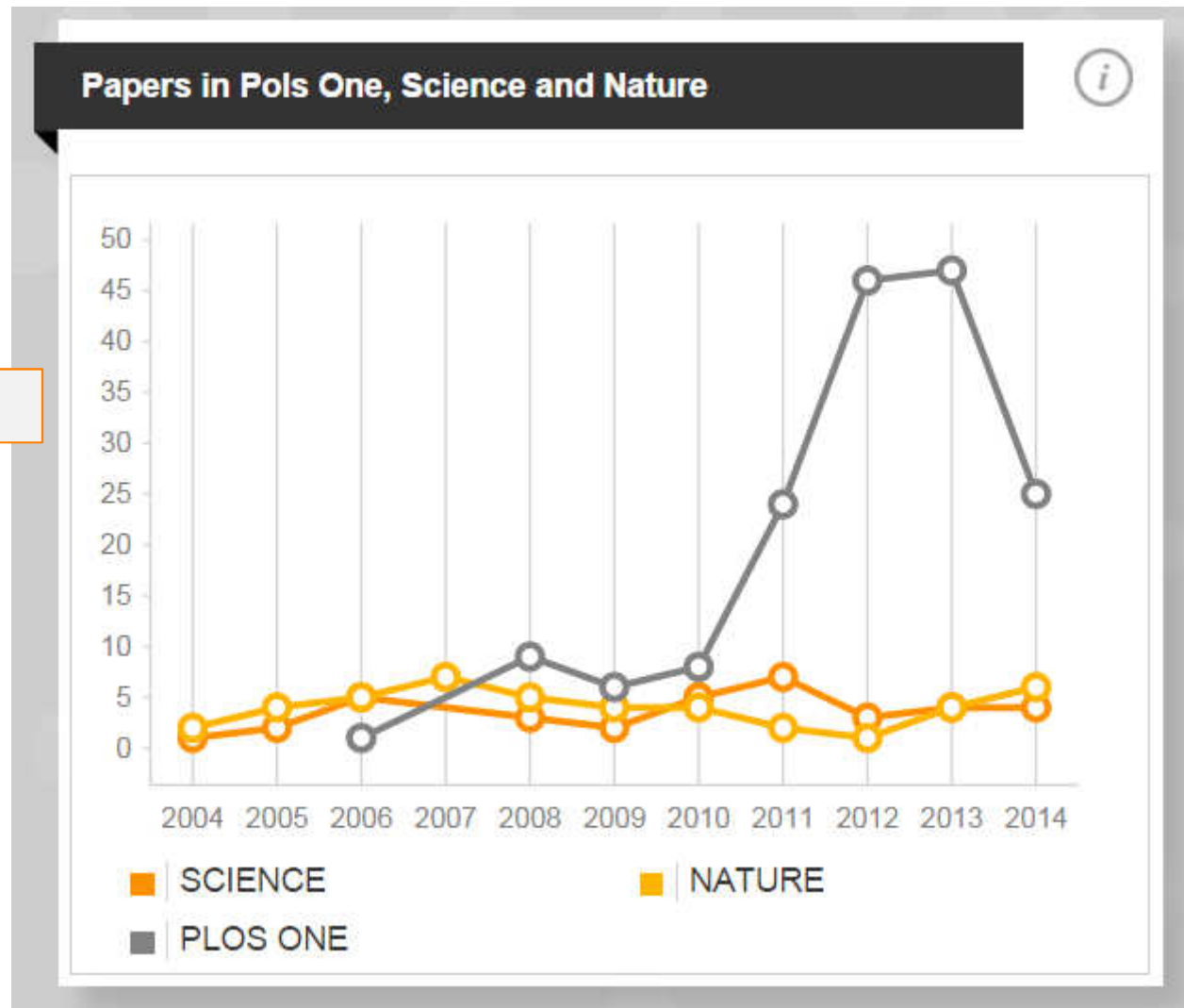
Key performance questions:

- What should our publication strategy be?
- Are we publishing in journals of the highest repute and impact?
- Are we improving in terms of publication strategy?
- Is our research showing citations influence above the world average?

Evidence Base Bibliometrics

- Volume of articles / books / monographs
- Count of articles in key high JIF journals e.g. Cell, Nature family, Science, NEJM etc.

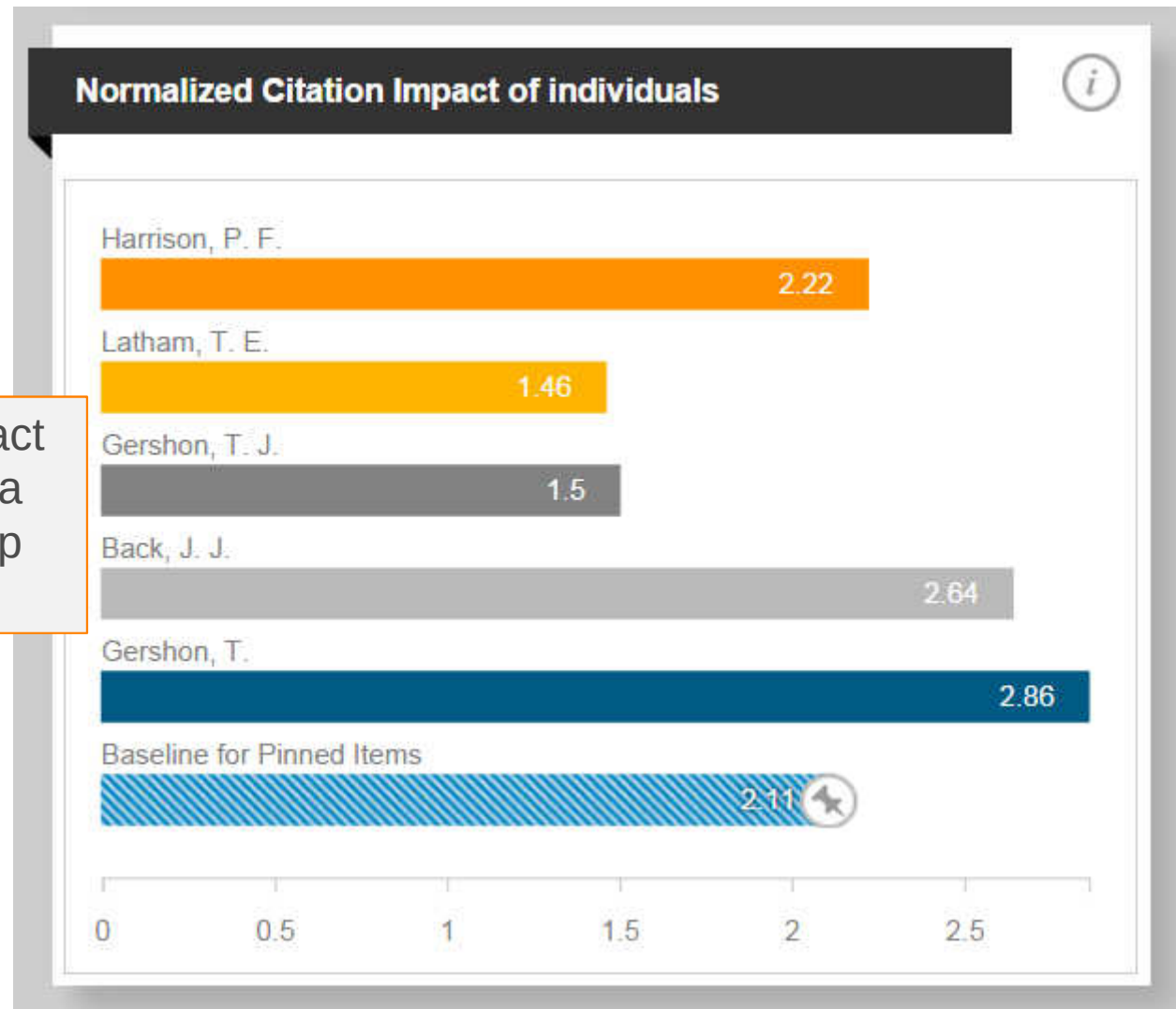
Papers in major Journals



Evidence Base Bibliometrics

- Subject field
normalised citations'
count per paper, per
researcher, groups of
researchers

Normalized Citation Impact
for our researchers, and a
baseline for a given group
of individuals



Evidence Base Bibliometrics

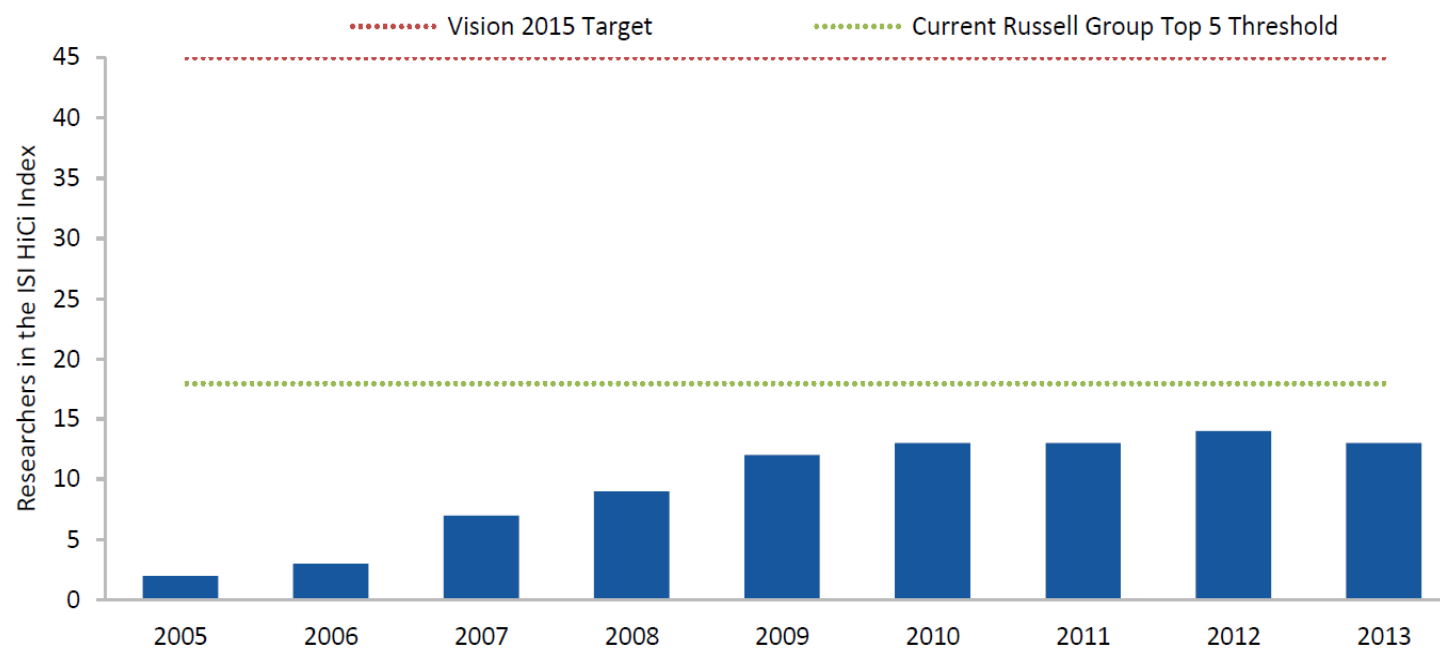
Highly Cited Index

- Lists (some) of the world's most influential researchers by 21 subject fields
- Count of researchers in the index is a considerable measure of esteem
- One useful tool for recruitment
- Impacts on the Shanghai Jiao Tong Academic Ranking of World Universities

Key performance questions:

- Who are the most influential researchers in terms of citations?

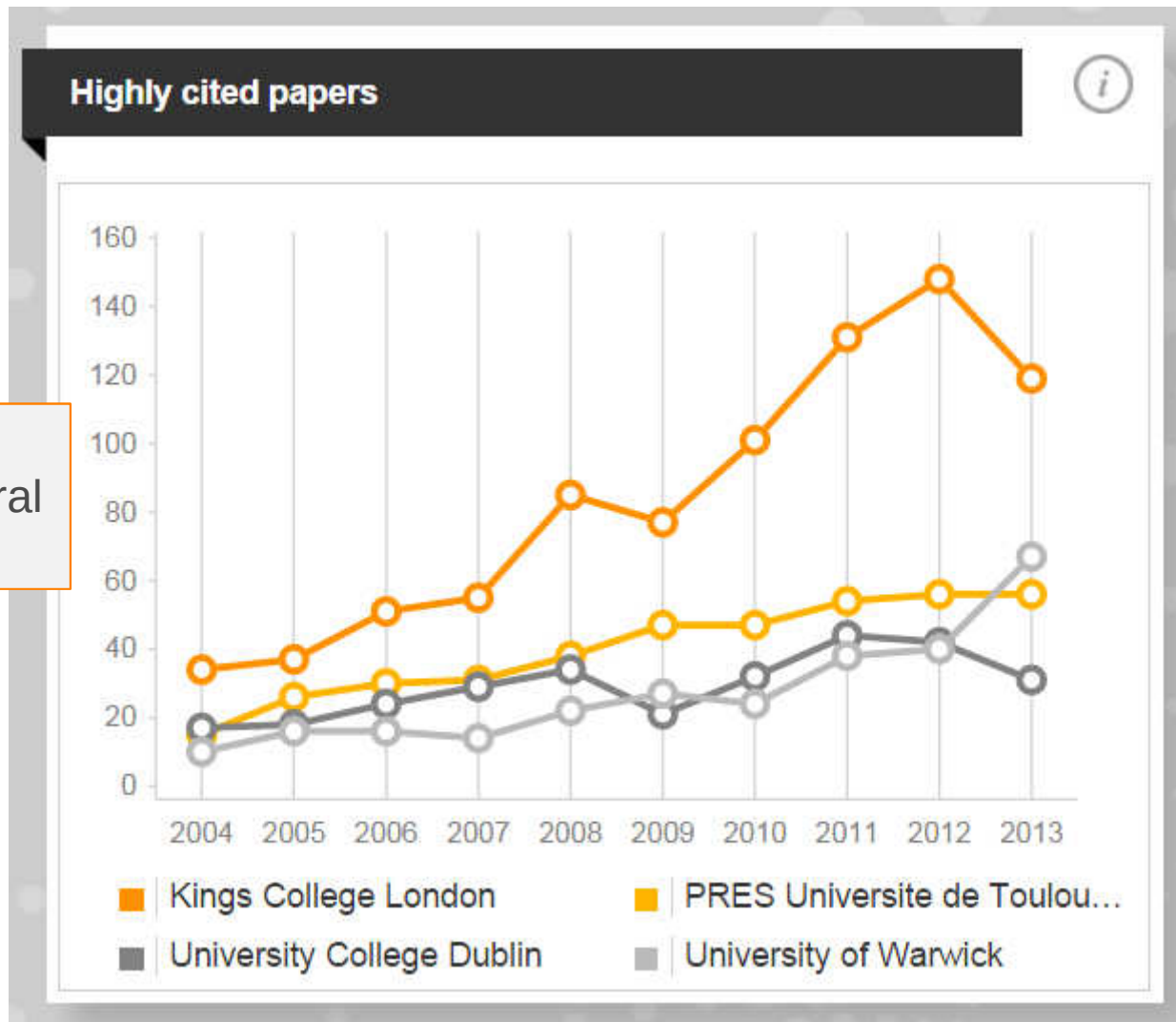
Evidence Base Bibliometrics



Warwick researchers in the ISI Highly Cited index (source: www.isihighlycited.com).

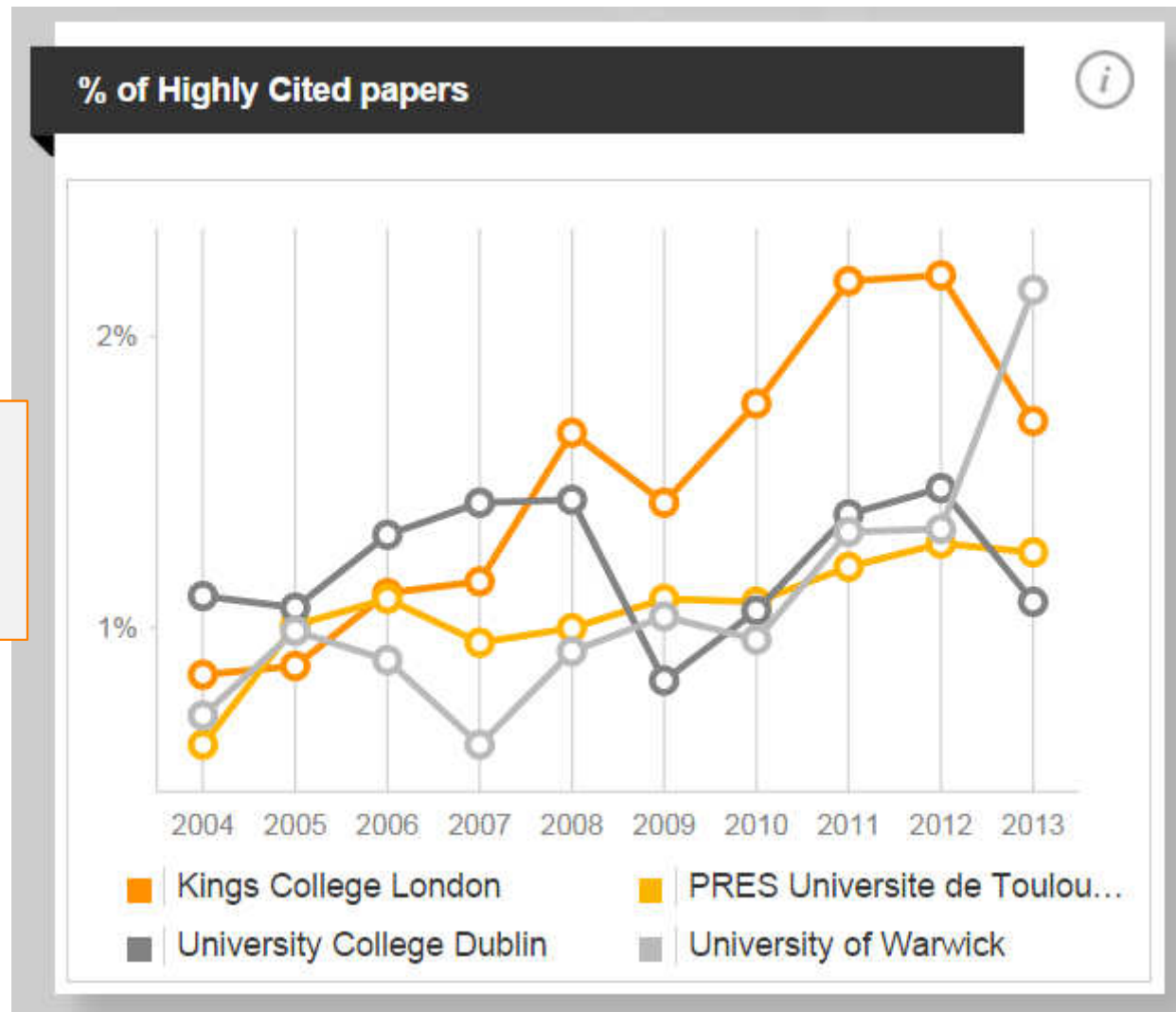
Evidence Base Bibliometrics

Amount of Highly Cited papers produced by several institutions



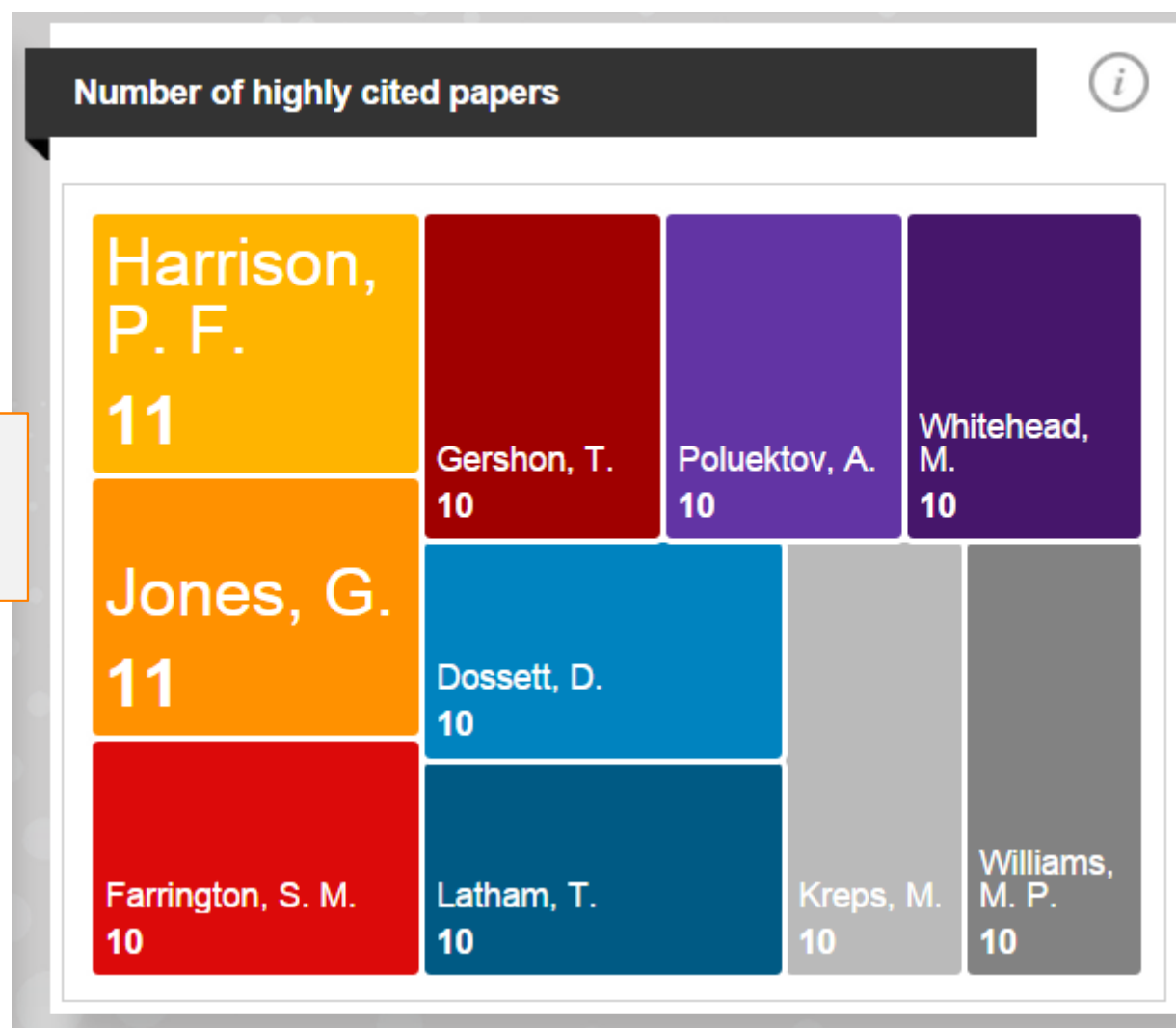
Evidence Base Bibliometrics

Highly Cited papers
produced by several
institutions in proportion of
their overall production



Evidence Base Bibliometrics

Number of Highly Cited
papers produced by a given
group of our researchers



THOMSON REUTERS

Evidence Base Bibliometrics

Collaborations

- The co-authorship details (names, affiliations) enable one to analyse collaborations networks by a paper, researcher, group or researcher or institutions
- Helps to inform internationalisation strategies

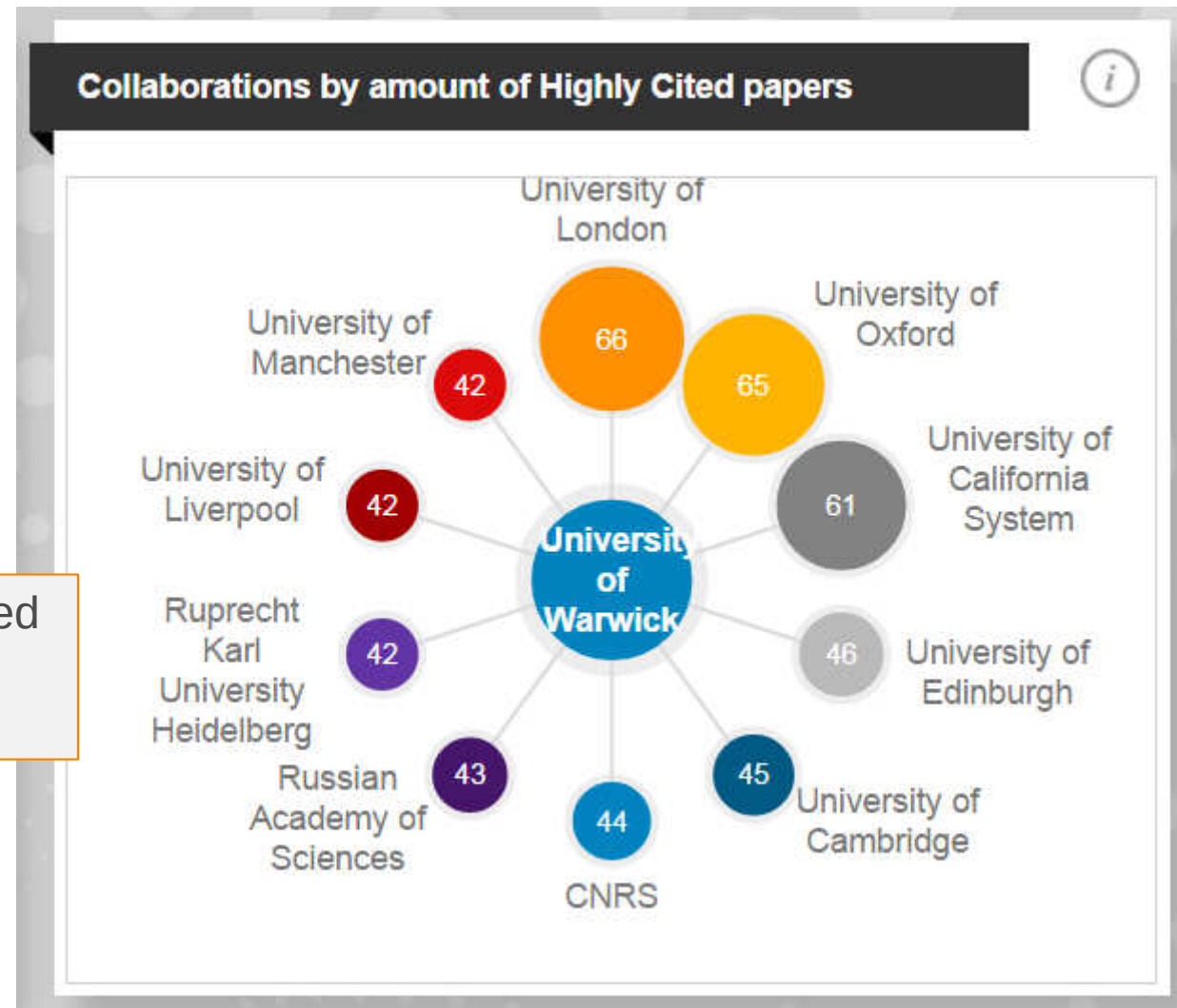
Key performance questions:

- Who are we collaborating with?
- How many prestigious collaborations do we have? e.g. with Harvard, MIT, Oxford, Cambridge, Max Plank Inst. etc.
- How can we better leverage out international collaborations?
- We have the possibility of forging a partnership or strategic alliance, how much are we already collaborating with the institution?

Evidence Base Bibliometrics

- The co-authorship details (names, affiliations) enable one to analyse collaborations networks by a paper, researcher, group or researcher or institutions

Our collaborations, measured by amount of Highly Cited papers published

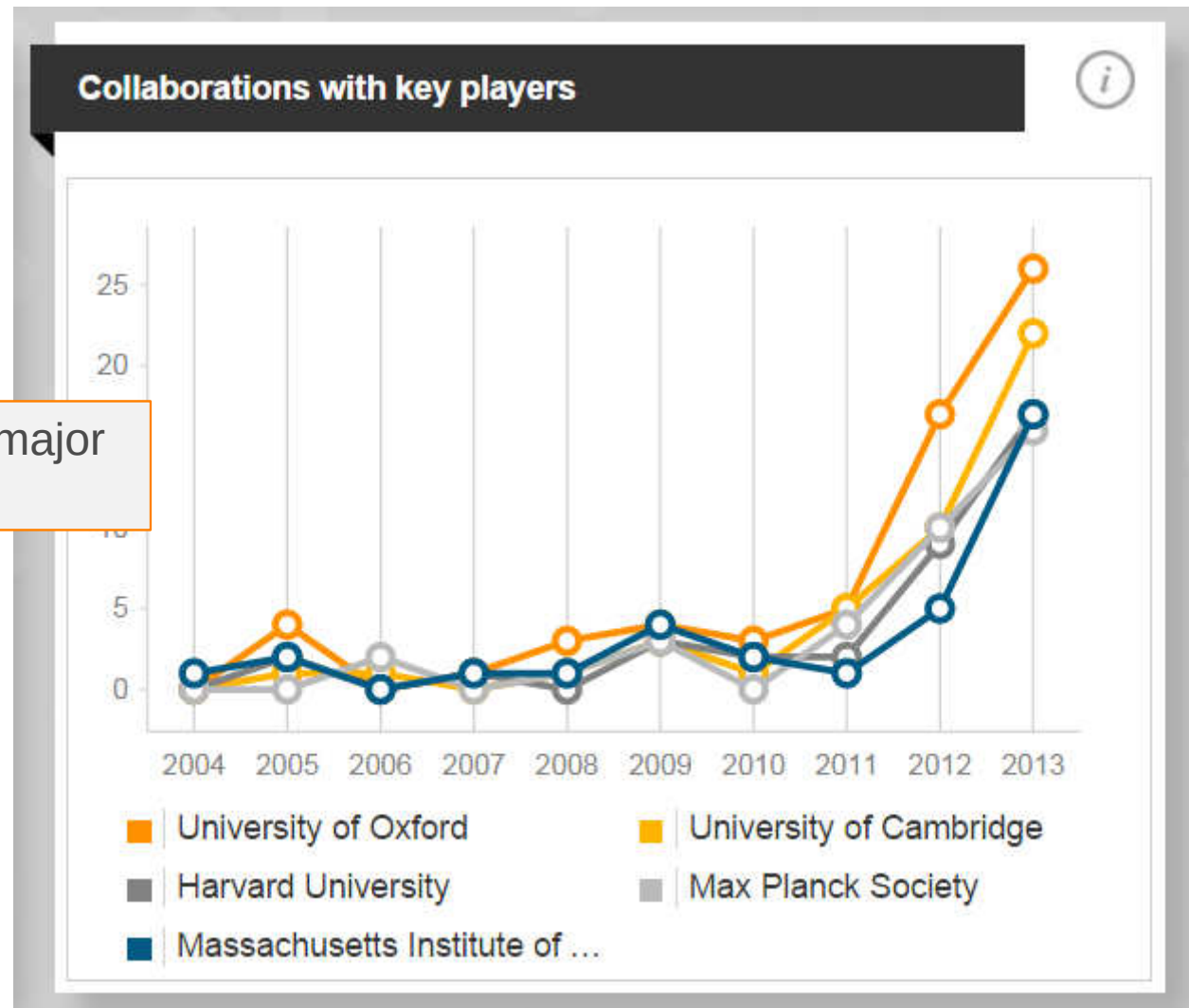


Evidence Base Bibliometrics

Collaborations

- Helps to inform internationalisation strategies

Our collaborations with major institutions is growing



Evidence Base

Grant / Contract Activity and Income

- Grant applications, awards and success rates used as measures of capacity building.
- How much research is funded externally versus internally?
- Contracts with industry (link with publications with industry) measure of success in establishing commercial research relationships. Industrial collaboration can be determined with bibliometrics too.
- What is the margin on specific funding sources?

Evidence Base Research Students

- Research student numbers are measures of vitality of the research environment and the subject's ability to build research capacity.
- Some research studentships are funded from external and / or competitive sources of funding, this can be used as a performance measure.
- Numbers of studentships attracting industrial sponsorship can be a measure achieving successful commercial links.

Evidence Base

Measures of Esteem

- Measures of esteem can be helping understand the recognition the research and researchers are receiving.
- Examples would be: awards, medals, highly selective membership or fellowships, media appearances, advisory board roles, highly regarded editorial roles etc...

Evidence Base Impact

- Testimonials, corroborating statement from CEOs, politicians, policy makers and other key stakeholders.
- Patent applications.
- Licence income.
- Start-up companies' revenue.
- Measured savings or efficiencies.
- Media features.
- Citations.
- Key statistics e.g. from health agencies, exhibitions.
- Digital analytics on web content access.
- Reference in Acts, policy documents, national or international standards.

Concluding Thoughts

What Did We Achieve?

- Improved academic staff accountability and performance
 - Research planning meets annually to review departments' performance
 - Generated an environment where performance is more proactively reviewed
 - Help to address underperformance
 - Metrics are used, in part, to inform the Vice-Chancellor's Advisory Group on reward and remuneration.
- Increase citations count
 - Citations analysis has raised the profiles of these metrics and helped researchers to develop their publications' strategy, this in turn has led to an increase in citations count.
- Publications in higher impact journals, books with high reputation publishers
 - Bibliometrics' analysis has helped challenge and inform departmental publications' strategy and fostered a culture of publishing in the very best journals.

What Did We Achieve?

- Significant growth in research income
 - As the University's research performance has improved, it in turn has led to an increase in success in winning research grants and, in turn, has helped the University's ability to attract leading researchers from across the globe. The research review process includes research income data and there are active process for challenging research income generation through the planning cycle.
- Significant growth in research student numbers
 - The University strategy had a goal to double PhD numbers by 2015. This motivated change and the University increased number significantly partly due to success in winning UK government funding and also from internal investment.
- Used analytics in remuneration reviews, as “one tool in the kit”
 - Citations and research income analytics have been used **CG1**elp inform the University's professorial pay and reward process.

CG1

Need to update this figure at start of October 2014 when rankings released. Rumour has it Warwick will rank higher than 124.

Carden, Giles; 2014-09-25

What Did We Achieve?

- A significant rise in THE World University Rankings
 - The University has risen in recent years from **220** to **103** in the THE World University Rankings at 2014.
 - The University ranks in the 81-90 range in the World Reputation Rankings



Other key University achievements

- A Fields Medal in Mathematics
 - Professor Martin Hairer won a Fields Medal in 2014
- UK Times / Sunday Times University of the Year 2014
 - Awarded University of the year award for a string of achievements and for consistently featuring in the UK top 10 rankings.



CG2

- Cultural change
 - Warwick has experienced a significant cultural shift accepting the need to positively and progressively manage performance and analytics have become a normal part of professional life.

Skaidrè 41

CG2

Need to update this figure at start of October 2014 when rankings released. Rumour has it Warwick will rank higher than 124.

Carden, Giles; 2014-09-25

The Future

- There is significant potential to use a range of new data sources including 'big data' to better understand the reach, significance and impact of research.
- Thomson Reuters, the largest information provider in the World, is exploring the potential to use a range of data sources to better understand the reach and impact of research.
- An example is the use of Recorded Futures web intelligence software in InCites2 which scan public web sources such as news publications, blogs, social media, financial databases, government websites etc.
- The next challenge is how to assess and measure the social, economic and cultural impact of research and, where possible, present it in an analytical context.

CG4

CG4

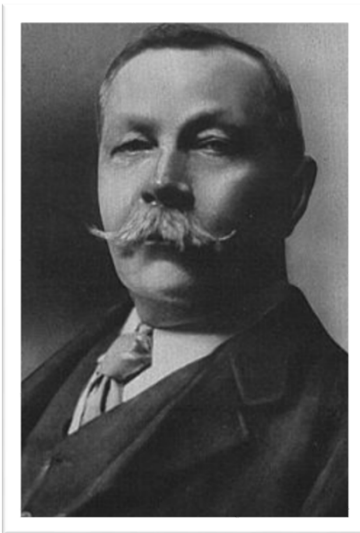
Need to update this figure at start of October 2014 when rankings released. Rumour has it Warwick will rank higher than 124.

Carden, Giles; 2014-09-25

Two different perspectives....

“Experts often possess more data than judgement.”

Colin Powell



“It is a capital mistake to theorize before one has data.”

Sir Arthur Conan Doyle



THOMSON REUTERS

Thank You For Your Attention

Email: giles.carden@thomsonreuters.com



<http://uk.linkedin.com/in/gcarden>

