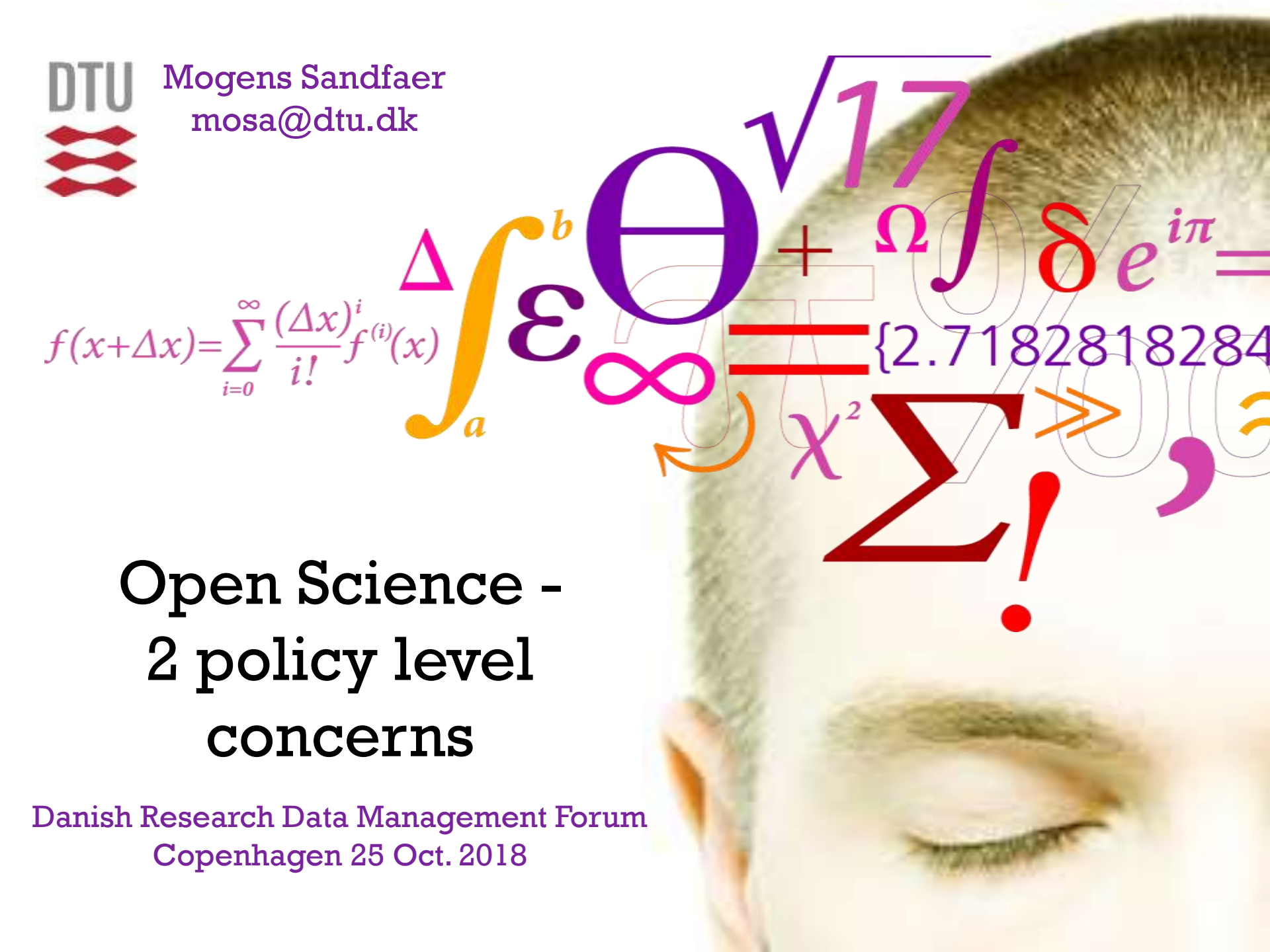
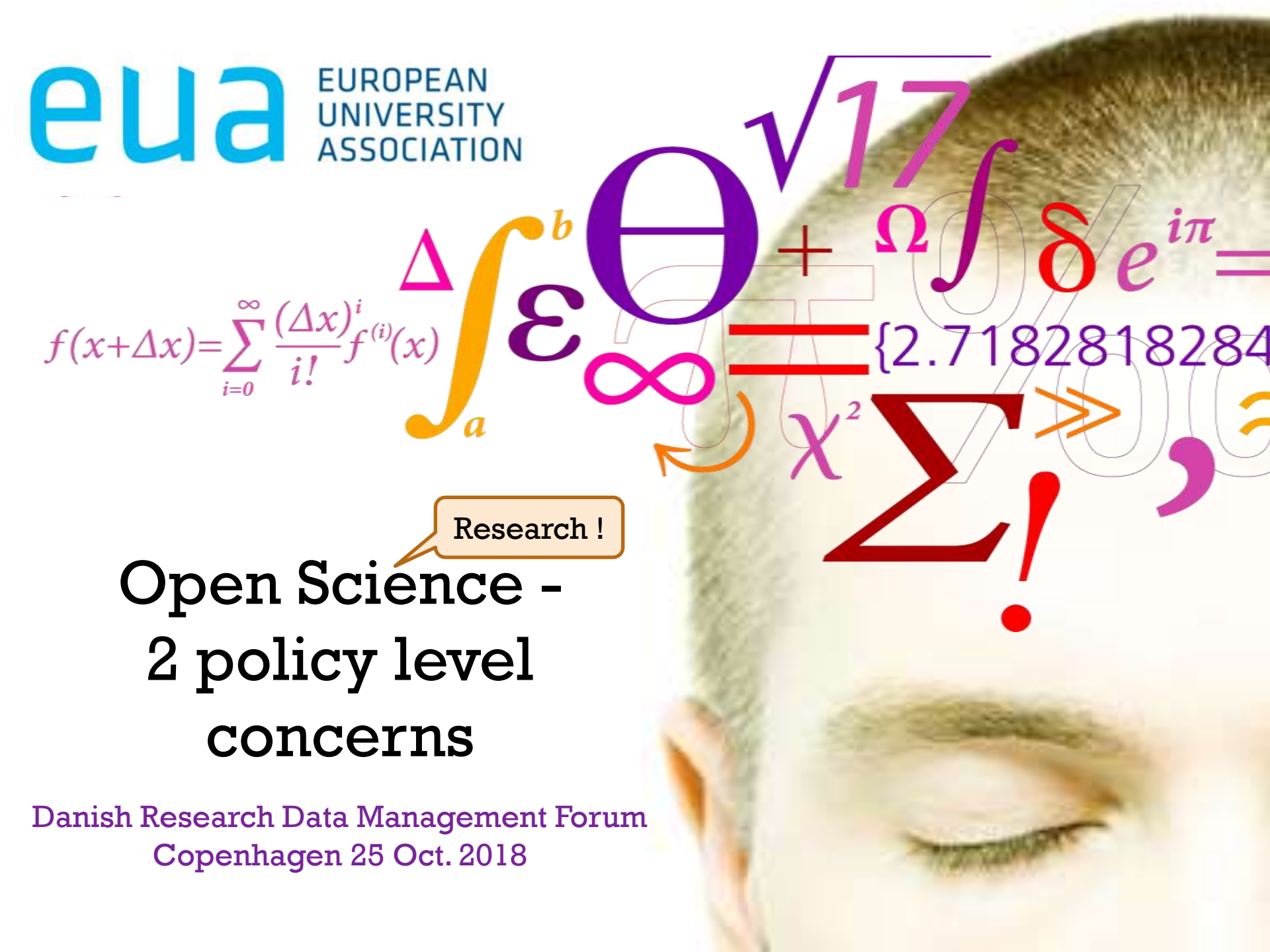
Mogens Sandfaer
mosa@dtu.dk



Open Science - 2 policy level concerns

Danish Research Data Management Forum
Copenhagen 25 Oct. 2018

EUROPEAN UNIVERSITY ASSOCIATION



Open Science - 2 policy level concerns

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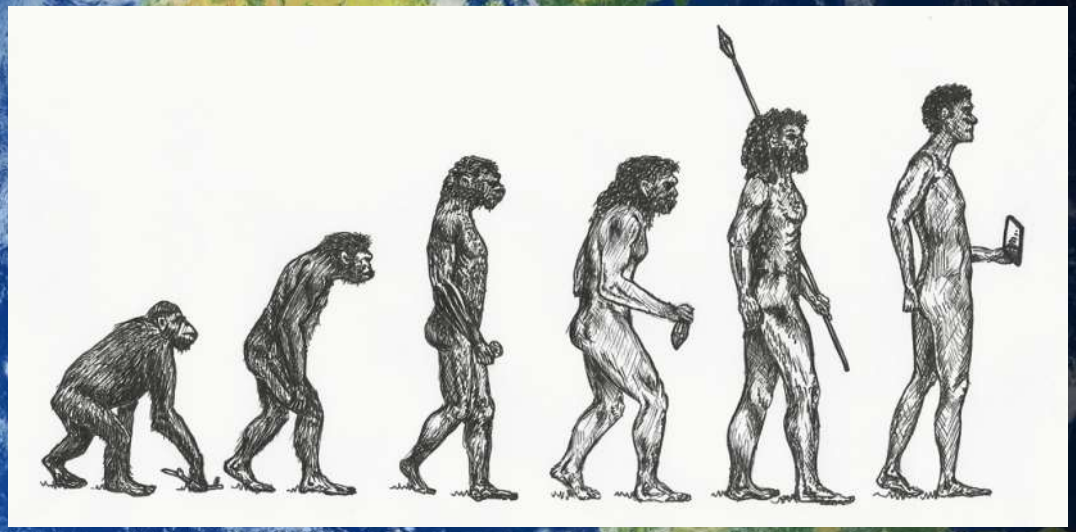


POLICY & ETHICS

Can Humans Live Well without Pillaging the Planet?

June 1, 2018

Mark Fischetti, Federica Fragapane


We need Science
(Science = Research)

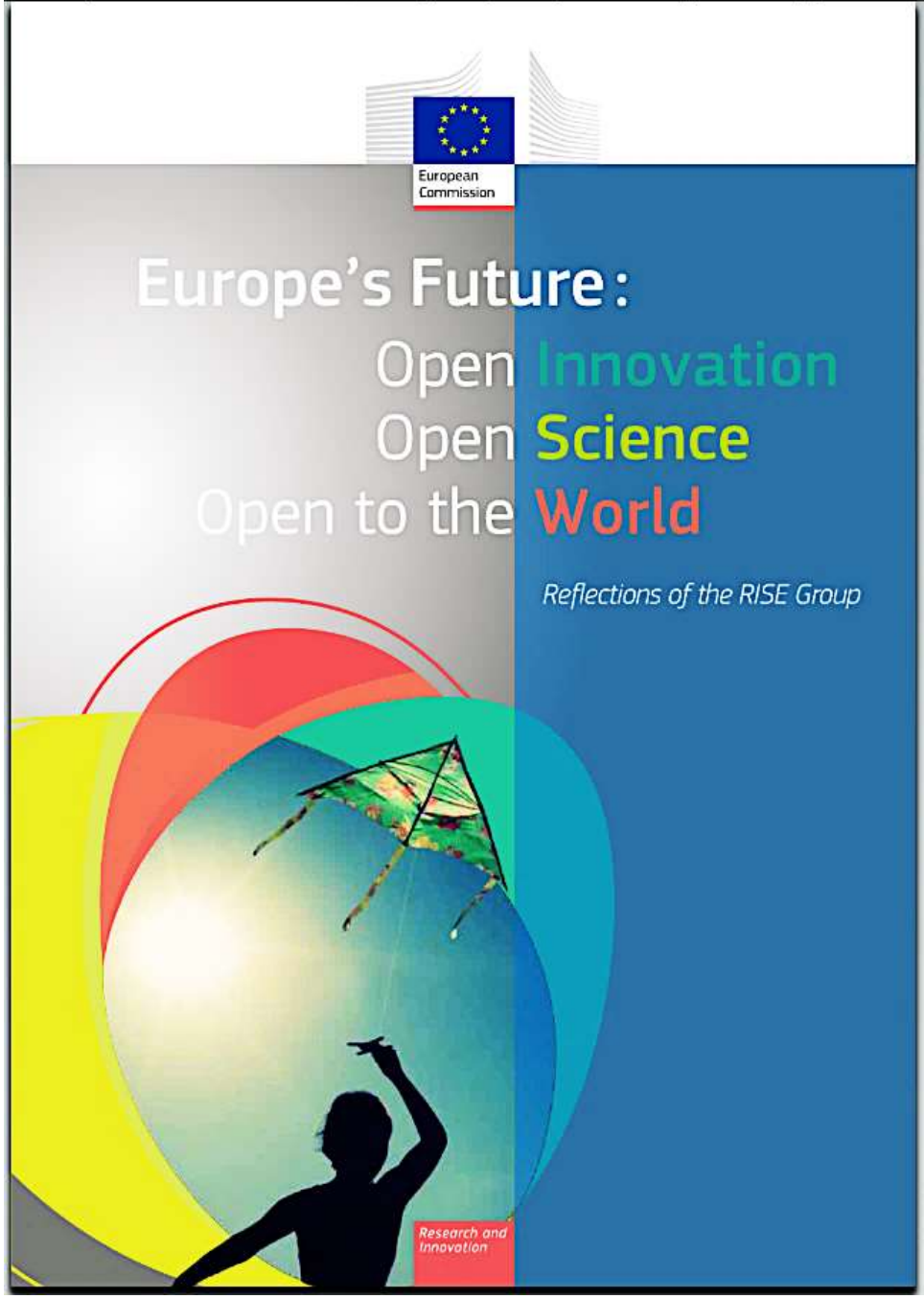

We need Science
Good Science


We need Science
Good Science
Open Science =
Science done right

Carlos Moedas, EU:

"Making our science and innovation more open and international will help Europe respond to the challenges of globalisation and social sustainability that the Commission has recently highlighted.

We should stand up in science and innovation to shape a truly inclusive globalisation."



https://ec.europa.eu/research/openvision/

EU Open Science Agenda

1. FAIR and open data
2. European Open Science Cloud
3. Next Generation Metrics
4. Open Access & Future of Scholarly Communication
5. Open Science Skills
6. Open Science Rewards
7. Research Integrity
8. Citizen Science

Yes, it is about
Open Access & Open Data.
But **much more**
than that!

As presented by JC Burgelman, DG RTD, at EARMA Leadership Event, April 18-20, 2018

The 2 policy level concerns

1. Measuring and rewarding Open Science efforts
2. Vendor lock-in of the research workflow/ecosystem

EU Open Science Agenda

1. FAIR and open data
2. European Open Science Cloud
3. Next Generation Metrics
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As presented by JC Burgelman, DG RTD, at EARMA Leadership Event, April 18-20, 2018

EU Open Science Agenda

1. FAIR a
2. Europ
3. Next G
4. Open
5. Open
6. Open
7. Resea
8. Citize

➔ Open/FAIR research data

➔ Facilitate reproducibility

➔ Open Access to publications

➔ Measuring and rewarding Open Science efforts & impacts (Incentives & Career implications)

As presented by JC Burgelman, DG RTD, at EARMA Leadership Event, April 18-20, 2018

Open Access to publications

- Clearly the simplest requirement to fulfill
- Publications are relatively well understood objects
- We have decades of experience in documenting and analyzing publications and their contexts
- But the concept of Open Access needs a bit clearing-up
  - Any form of electronic access without payment?
    - Even transient forms, lasting only for weeks, months?
  - Only sustainable/permanent forms of Open Access?
    - Trusted repositories
  - Any post peer-review version, or only (a) certain version(s)

FAIR Data & Reproducibility

A substantial challenge

- **F**indable - Documented with rich metadata and unique identifier
- **A**ccessible – Data and metadata must be easily retrieved
- **I**nteroperable – Understandable language & common vocabularies
- **R**eusable – Clear license to reuse & even richer metadata to enable this

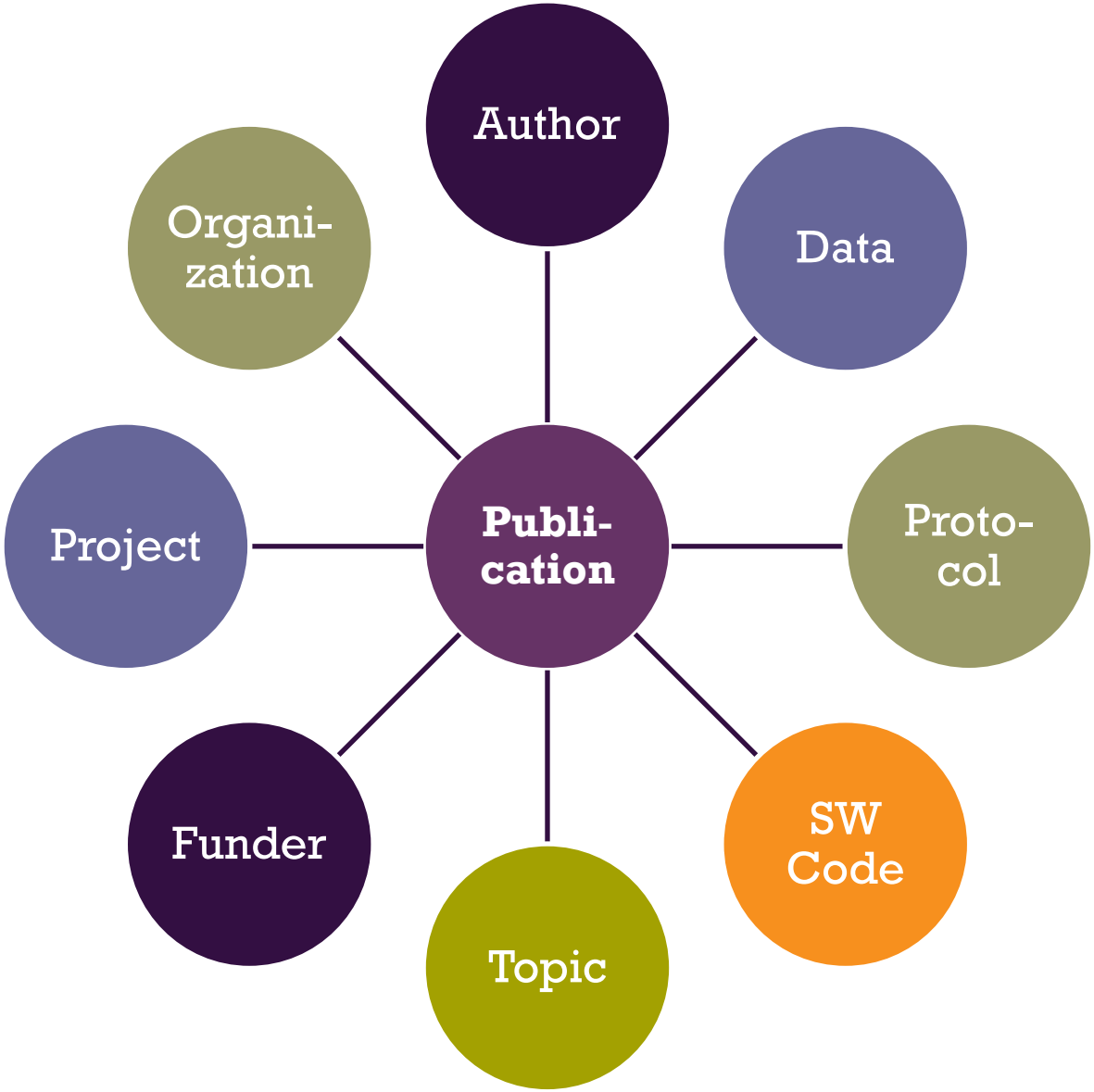
Adding the challenge of reproducibility:

- + FAIR Software code
- + FAIR Research protocols

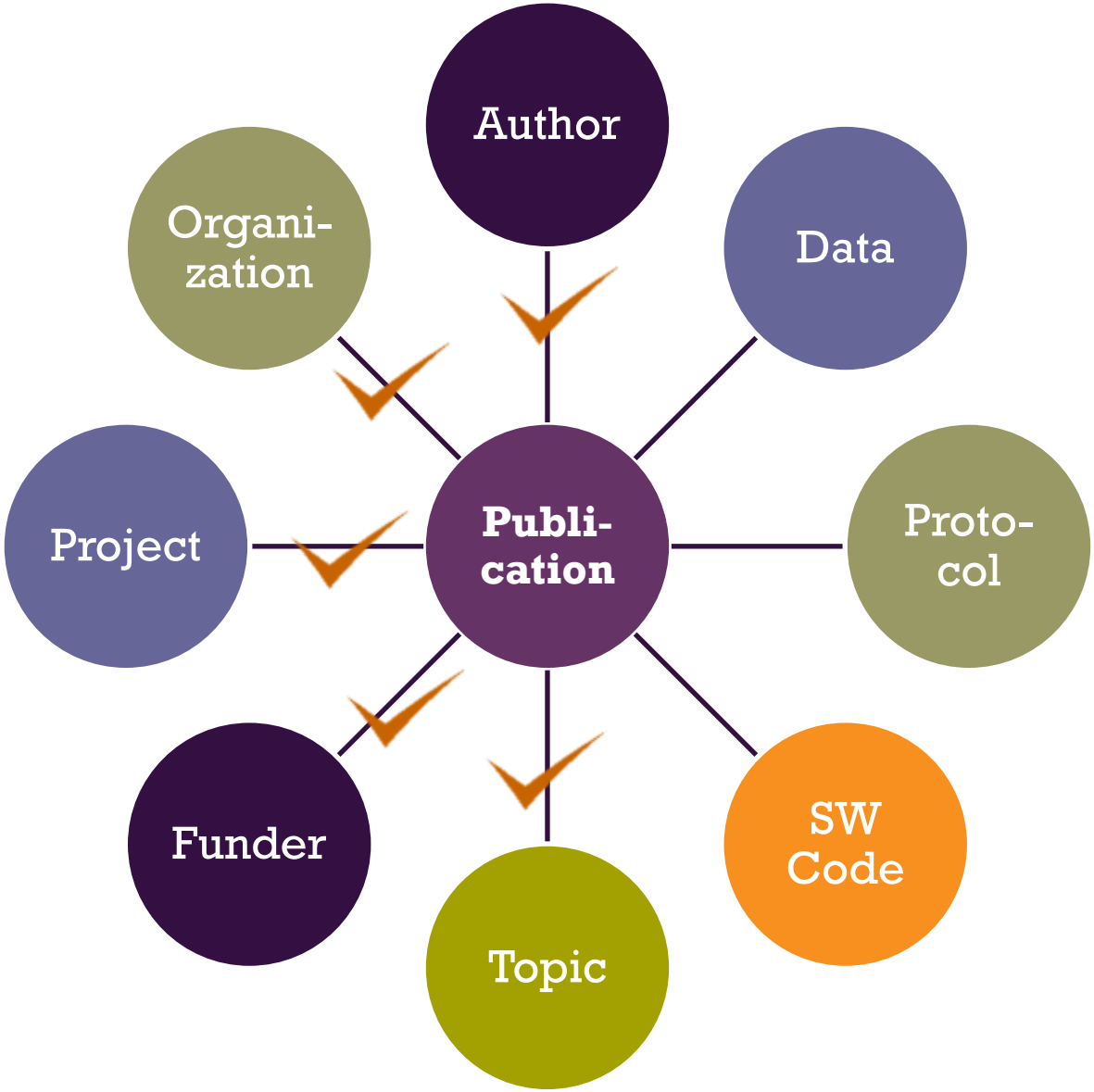
Substantial effort.
Involving many actors.
Requiring standards, collaboration, resources, and incentives

How to measure all this?

Publication centric approach ?



Publication centric approach ?



But for rewarding researchers (affecting careers) a **very high level of precision is needed**

- An AUTHOR is **not** an AUTHOR is **not** an AUTHOR
  - At least not in many cases
- And some are not credited as AUTHORS at all
- There is quite some
  - Fog – Inflation – Omission – in authorship attribution
- To reward Open Science efforts correctly
  - We need to understand **where credit is due**

Fog, Inflation, Omission

Fog

nature International weekly journal of science

Physics paper sets record with more than 5,000 authors

Detector teams at the Large Hadron Collider collaborated for a more precise estimate of the size of the Higgs boson.

Davide Castelvecchi

15 May 2015

CERN

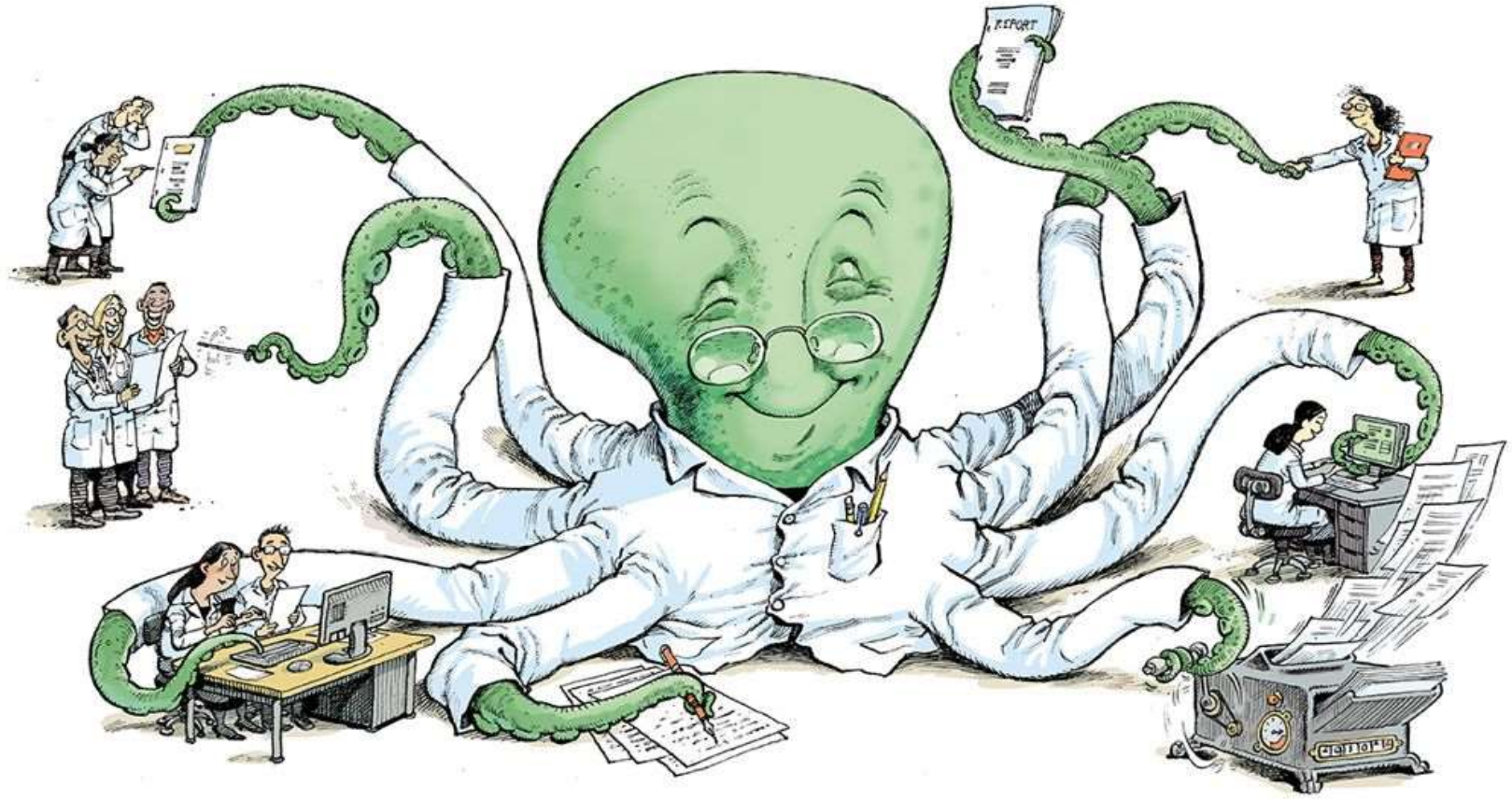
Thousands of scientists and engineers have worked on the Large Hadron Collider at CERN.

Fog, Inflation, Omission

A Fermilab approach described by Biagoli
in Scientific Authorship, 2003

- Standard author list, updated twice a year:
  1. **Researchers** with a PhD are included if they devote 50% of their time to an experiment
  2. **Graduate students** are included if they work full time on an experiment
  3. **Technicians** are included if they make major contributions to the experiment.
- Those who leave an experiment remain authors of resulting papers for a year after they leave.
- Authorship = "credits for accumulated labor"

Fog, Inflation, Omission



nature 12 SEPTEMBER 2018

Thousands of scientists publish a paper every five days

Fog, Inflation, Omission

Fog

UNIVERSITY OF CAMBRIDGE

Unlocking Research

University of Cambridge Office of Scholarly Communication

The case for Open Research: the authorship problem

July 12, 2016 Uncategorized academia, authorship, contributions, esteeem, experiment, fraud, hyperauthorship, reward Office of Scholarly Communication

This is the second in a blog series about why we need to move towards Open Research. The first post about the mis-measurement problem considered issues with assessment. We now turn our attention to problems with authorship. Note that as before this is a topic of research in itself – and there is a rich vein of literature to be mined here for the interested observer.

Sugimoto asked: What does 'authorship' mean when there are more authors than words in a document? This type of mass authorship raises concerns about fraud and attribution. Who is responsible if something goes wrong?

The authorship 'proxy for credit' problem

Of course not all of those 5,000 people actually contributed to the *writing* of the article – the activity we would normally associate with the word 'authorship'. **Scientific authorship does not follow the logic of literary authorship because of the nature of what is being written about.**

Time for open science skills to count in academic careers!

EOSC pilot
The European Open Science Cloud for Research Pilot Project
www.eoscpilot.eu

4TU. CENTRE FOR RESEARCH DATA

26.09.2018 - 09:30, Delft ,Netherlands

How can academic rewards systems better recognise the work to make science open, and encourage researchers to develop the right skills?

- Nature 508, 312–313 (17 April 2014) doi:10.1038/508312a

CRediT

CRediT is high-level taxonomy, including 14 roles, that can be used to represent the roles typically played by contributors to scientific scholarly output. The roles describe each contributor's specific contribution to the scholarly output.

Background

CRediT grew from a practical realization that bibliographic conventions for describing and listing authors on scholarly outputs are increasingly outdated and fail to represent the range of contributions that researchers make to published output. Furthermore, there is growing interest among researchers, funding agencies, academic institutions, editors, and publishers in increasing both the transparency and accessibility of research contributions.

- https://casrai.org/credit/

CRediT roles

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

Clip from the mailing list of:

- **Danish Forum for Research Data Managers**

CASRAI

Home Our Work Our Community Subscribe

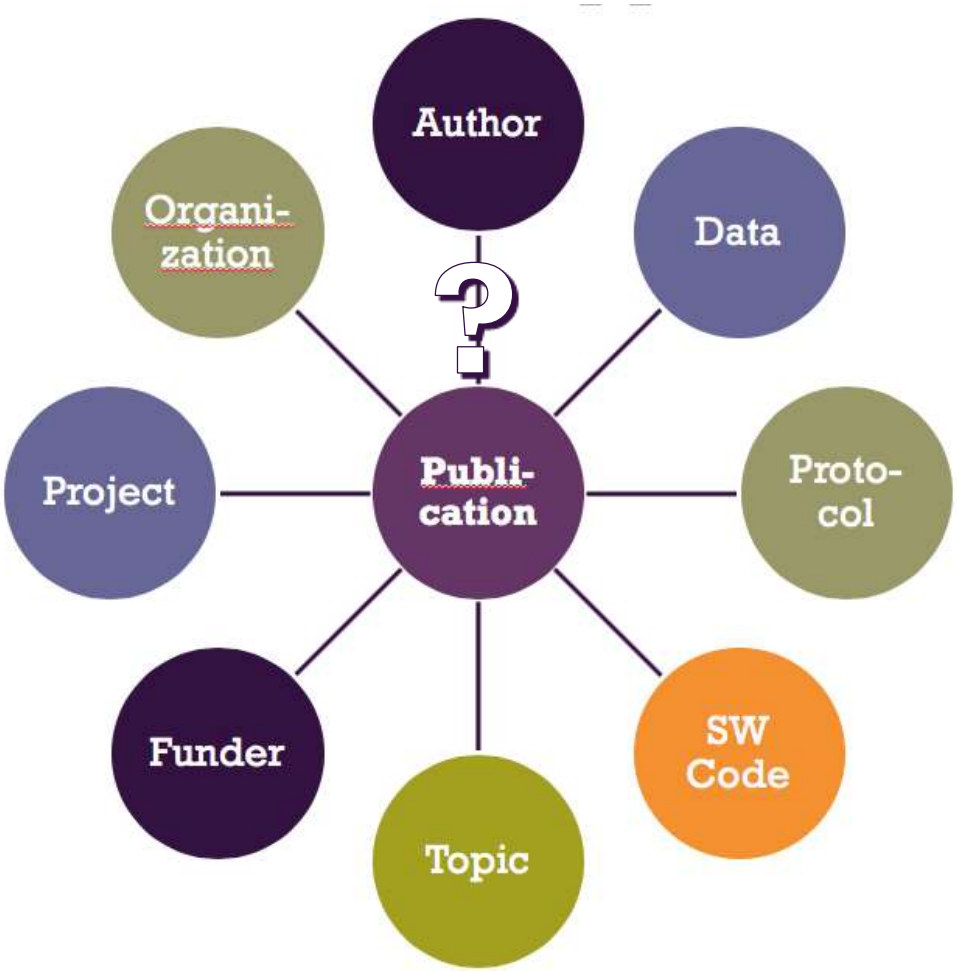
CRT

CRediT

CRediT is high-level taxonomy, including 14 roles, that can be used to represent the roles typically played by contributors to scientific scholarly output. The roles describe each contributor's specific contribution to the scholarly output.

#	ROLE	DEFINITION
1	***Conceptualization***	Ideas; formulation or evolution of overarching research goals and aims.
2	***Data curation***	Management activities to annotate (produce metadata), scrub data and maintain research data (including software code, where it is necessary for interpreting the data itself) for initial use and later re-use.
3	***Formal analysis***	Application of statistical, mathematical nal, or other formal techniques to analyse or synthesiz ta.
4	***Funding acquisition***	Acquisition of the financial support for t ding to this publication.
5	***Investigation***	Conducting a research and investigation p the exp lection.
6	***Methodology***	Development or design of methodology; crea
7	***Project administration***	Management and coordination responsibility for the rch ac
8	***Resources***	Provision of study materials, reagents, materials, pa resources, or other analysis tools.
9	***Software***	Programming, software development; designing supporting algorithms; testing of existing code
10	***Supervision***	Oversight and leadership responsibility for the ng men rnal to the core team.
11	***Validation***	Verification, whether as a part of the activity or separate, of the ucibility xperiments and other research outputs.
12	***Visualization***	Preparation, creation and/or presentation of the published work, sualization/dat entation.
13	***Writing – original draft***	Preparation, creation and/or presentation of the published w ly writing the initial draft (including substantive translation).
14	***Writing – review & editing***	Preparation, creation and/or presentation of the pu work by those from the original research group, specifically critical review, commentary or revision – including r post-publication stages.

So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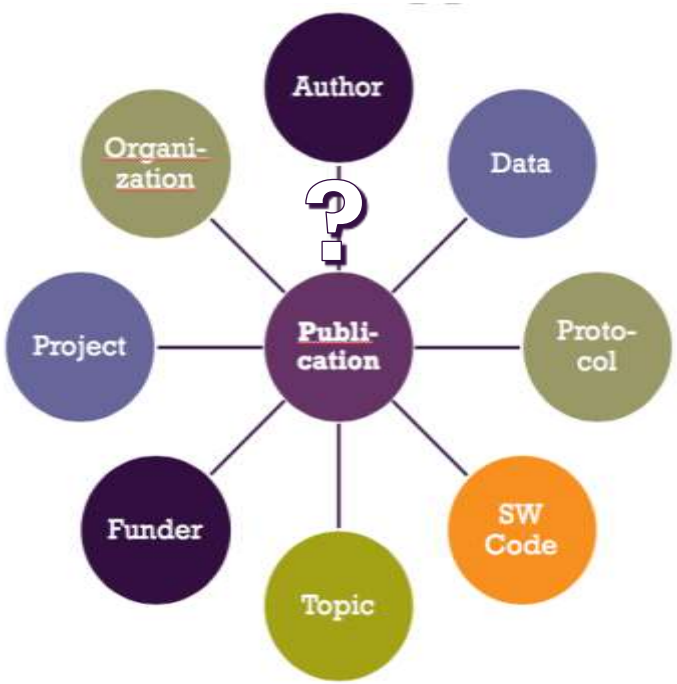
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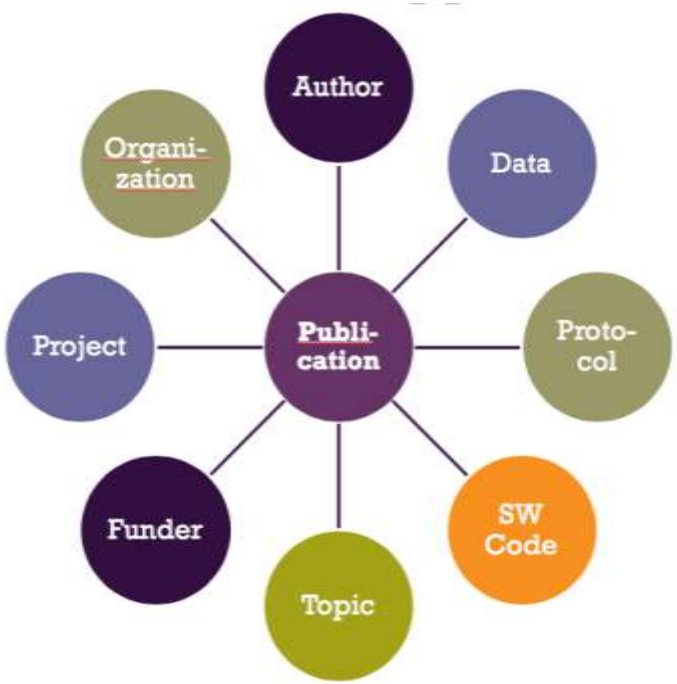
Conceptualization
Data Curation
Data Visualization
Writing - Review
Formal Analysis
Methodology
Project Administration
Resources
Supervision
Testing

So



Findable

Accessible

Interoperable

Reusable

So – When is this ready?

- A systemic and a cultural change
- But Open Science **is** just science done right
- A bit of a journey
  - Challenging, doable and rewarding
  - The sooner we start ….
- **Report from the EU expert group on Open Science indicators expected end of 2018**

So – When is this ready?

- **But other reports are already published**

https://ec.europa.eu/research/openscience/pdf/os_rewards_wgreport_final.pdf

So – When is this ready?

Open Science Career Assessment Matrix

- **Research output**
  - Research activity
  - Publications
  - Datasets and research results
  - Open Source
  - Funding
- **Research process**
  - Stakeholder engagement / citizen scíence
  - Collaboration and interdisciplinarity
  - Research integrity
  - Risk management
- **Service and leadership**
  - Leadership
  - Academic standing
  - Peer review
  - Networking
- **Research impact**
  - Communication and dissemniation
  - IP (patents, licenses)
  - Societal impact
  - Knowledge exchange
- **+ Teaching and supervision**
  + Professional experience

So – When is this ready?

- **But other reports are already published**

https://ec.europa.eu/research/openscience/pdf/integrated_advice_ospp_recommendations.pdf

Research & E-Infrastructures

Research Libraries

Universities & Research Performing Organisations

Policy Making Organisations

Research Funding Organisations

Publishers

Researchers

Scientific Societies & Academies

Citizen Science & Public Engagement Organisations

Rewards and Incentives

Funders, research institutions and other evaluators of researchers should actively develop/adjust evaluation practices and routines to give extra credit to individuals, groups and projects who integrate Open Science within their research practice.

Studies must be commissioned and funded to propose guidelines for best practice and tools for research assessment by 2019, together with an active delivery plan and associated timeline for their implementation. These guidelines must take into account career stage and discipline, and be appropriately tailored to their target such as individual, institution and so forth. Exemplars of innovation and good open science practice must be collated, taking into account the DORA Declaration, the Leiden Manifesto, the OS-CAM and other relevant initiatives.

Public research performing and funding organisations (RPOs/RFOs) should provide public and easily accessible information about the approaches and measures being used to evaluate researchers, research and research proposals.

The traditional academic career structure disincentivises Open Science because of the current focus on tenured positions based solely or largely on publication output. Institutions need to have a career and reward structure for all researchers, and particularly for Early Career Researchers (ECRs), that values and promotes a diverse range of outputs, activities and career directions. This should include facilitating a means by which researchers can, for example, move between academia and industry or between national jurisdictions.

Research & E-Infrastructures

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Extra credit to individuals, groups and projects who integrate Open Science within their research practice

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Guidelines for best practice and tools for research assessment by 2019

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Guidelines practice an research as by 2019

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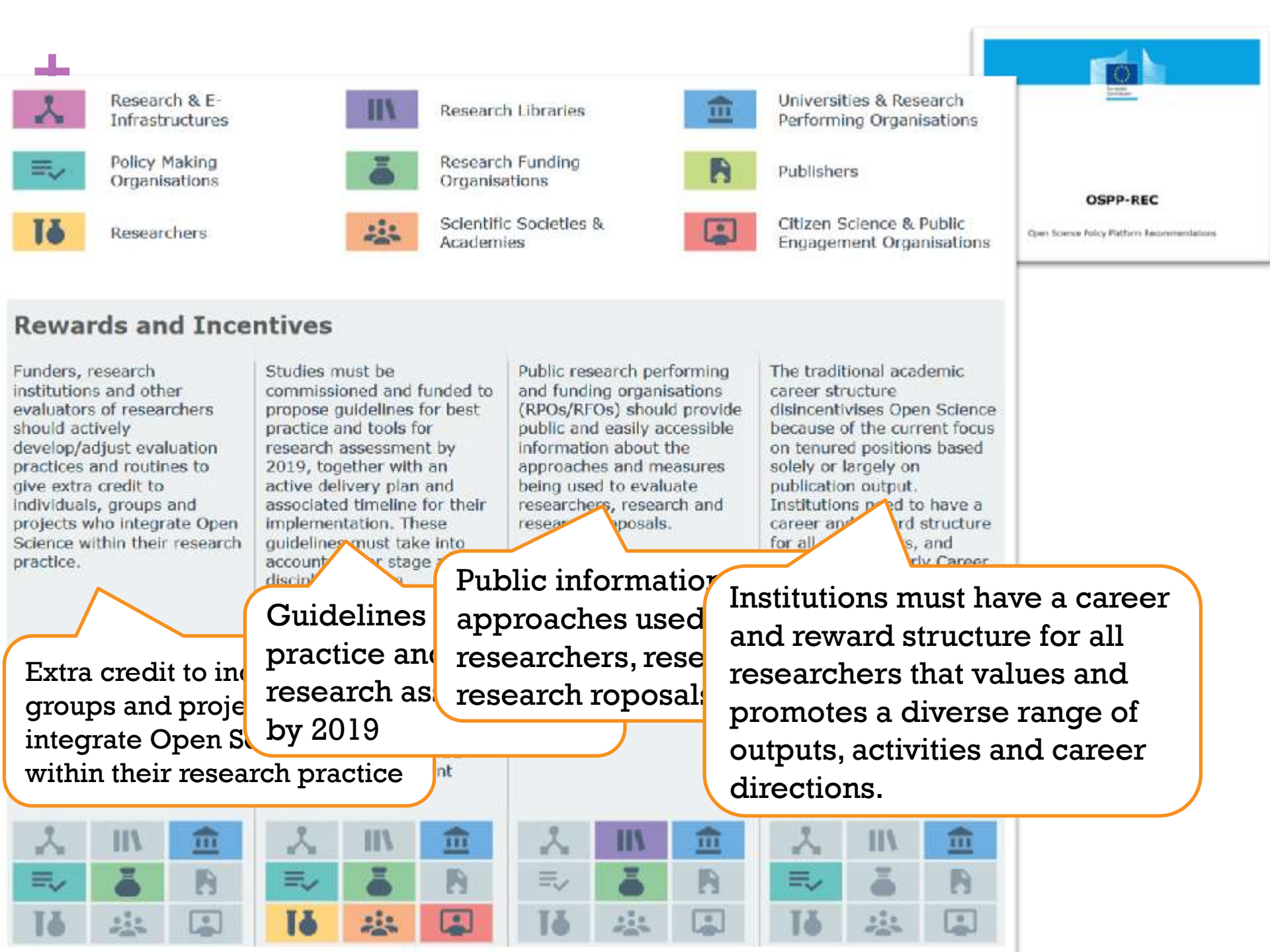
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Risk of Workflow Lock-in

Growing concern, addressed recently and repeatedly by

- Roger C. Schonfeld, Director Libraries and Scholarly Communication Program of Ithaka S+R
- "a not-for-profit service that helps the academic and cultural communities serve the public good and navigate economic, technological, and demographic change"

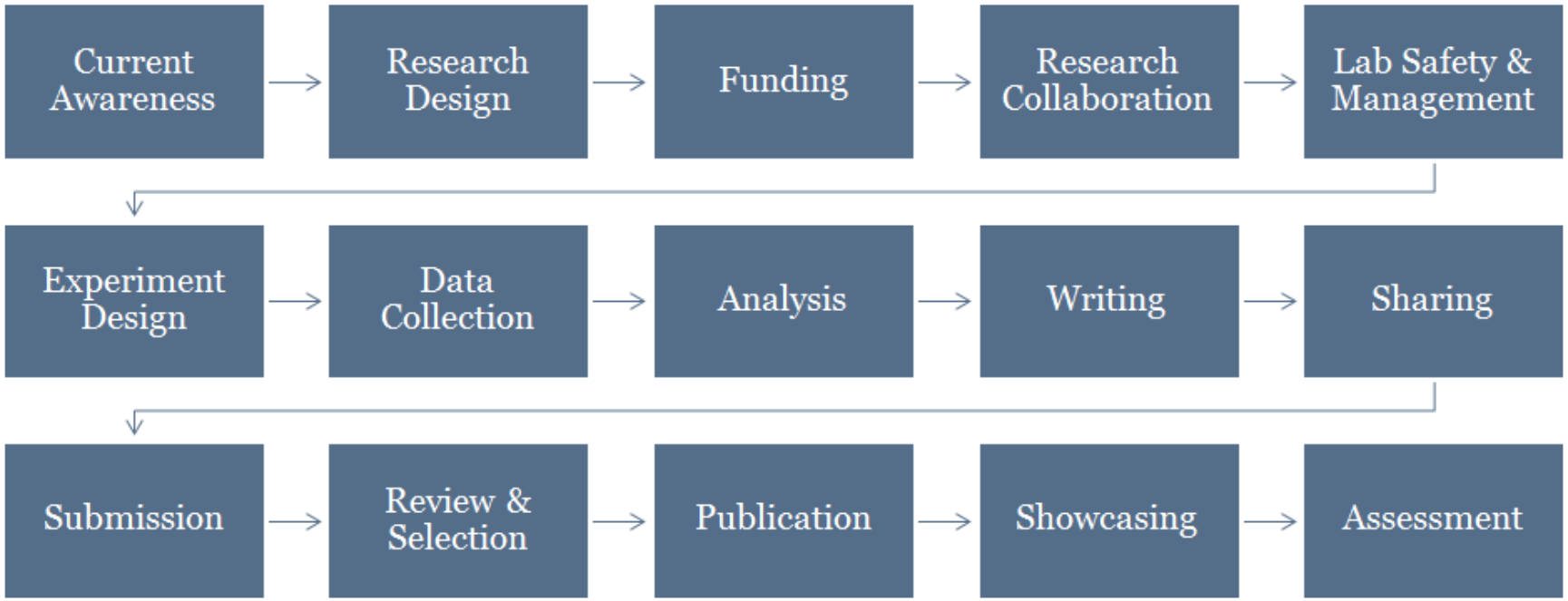
Ithaka white paper

http://www.sr.ithaka.org/publications/big-deal-research-infrastructure/

Based on a series of blog posts at *Scholarly Kitchen*

https://scholarlykitchen.sspnet.org/author/rschon/

Research workflow



Seamless system integration across the full research lifecycle

- Offers **great comfort** and time saving to researchers
- Presents a **great risk** of vendor **lock-in**, if we end up with closed solutions with **very high switching costs** and **very few switching options**, due to lack of vendors/lack of competition

Risk of Workflow Lock-in

- **Actually we only have 1½ vendor !**
- 1 - **Elsevier**
  - Having acquired and integrated a large number of companies and their systems – besides primary publishing
    - SSRN and bepress - preprints, Mendeley - research collaboration and research data management, Atira/Pure - funding, project and publication workflows and repository, etc. etc.
  - Having developed Scopus and Scival databases and research assessment (intelligence) systems
- >¼ - **Digital Science** (Holtzbrink)
  - Suite of (so far) individual companies offering their own products such as FigShare, Symplectic, LabGuru, Altmetric, Peerwith etc. etc.
- <¼ - **Center for Open Science** / Open Science Framework
  - A workflow backbone (non-profit) open for plugging in products from various vendors and contributors

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Schonfeld: An emerging **duopoly** ... could marginalize other publishers large and small and lead to the Big Two moving ahead of their increasingly distant rivals. Elsevier and Digital Science are in a race to build out a complete set of these research workflow tools …

Simplified research workflow

My tentative simplification into 5 main phases

1. **Preparing** – Reading, staying up to date, designing, writing applications, getting funding, networking
2. **Carrying out** - Planning in detail, acquiring resources, experimenting, running labs, collecting data, analysing, networking
3. **Writing** – documenting, sharing ideas and data, conference presenting, preprinting, submitting, resubmitting, networking
4. **Peer-review** – Dialogue with reviewers, optimising writing, achieving certification, getting formally ”published”, networking
5. **Evaluation** – Assessment metrics, impact, bibliometrics, altmetrics, career building, networking

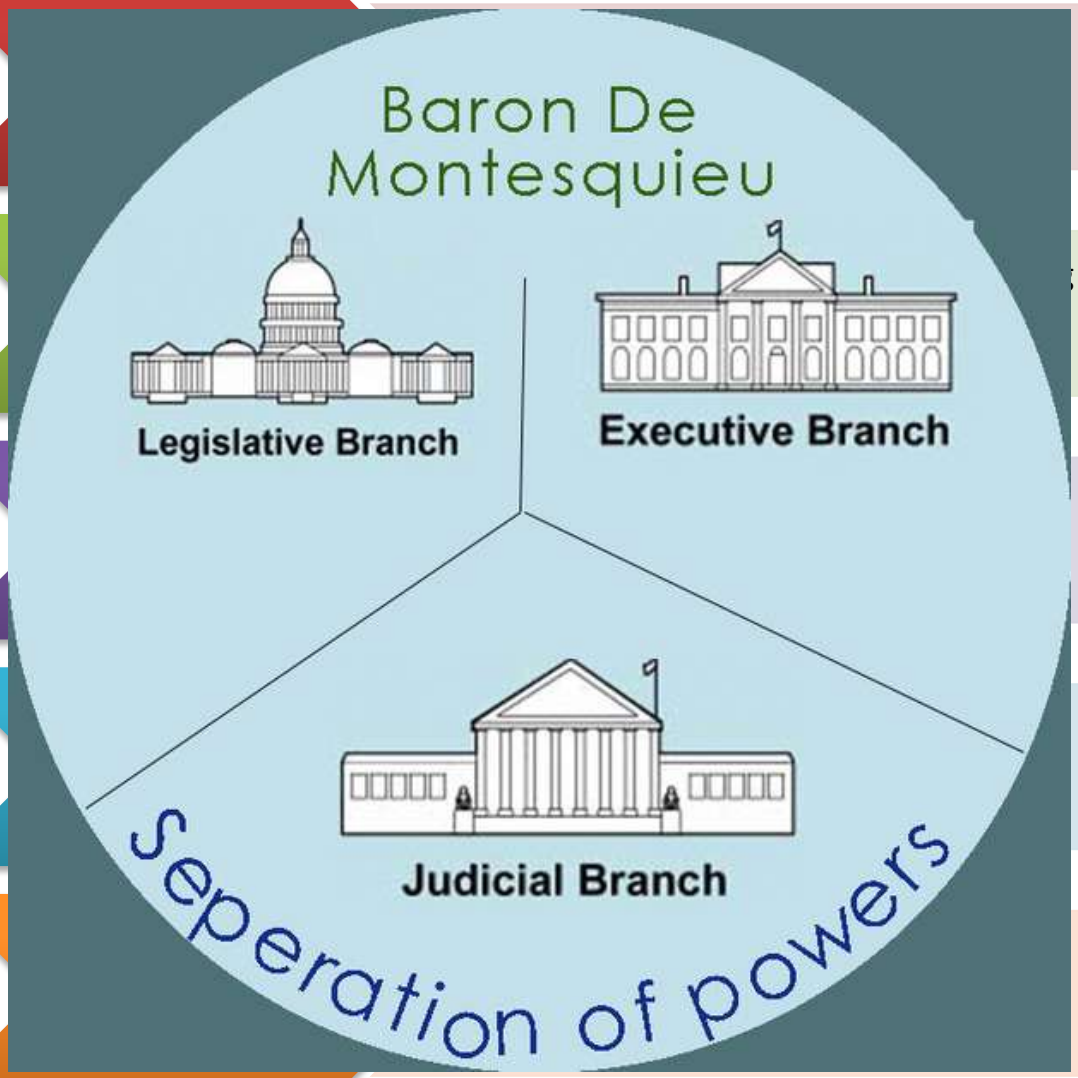
Simplified research workflow

How to avoid lock-in and lack of competition ?

Simplified research workflow

Simplified research workflow

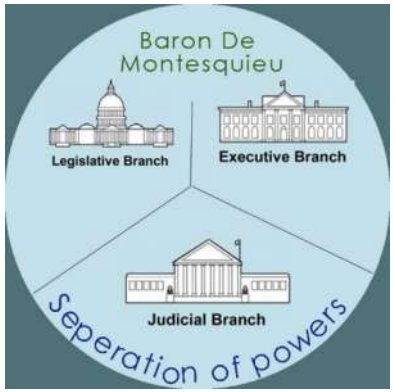
Is it about separation of powers ?



Simplified research workflow

Avoiding closed vertical integration?

Is it about separation of powers ?



1

Preparing – Reading, staying up to date, designing, writing applications, getting funding, networking

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Carrying out - Planning in detail, acquiring resources, experimenting, running labs, collecting data, analysing, networking

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Simplified research workflow

Companies should not integrate/ work across phases ?

Companies may work across phases - if all data of each phase is made openly available to competitors?

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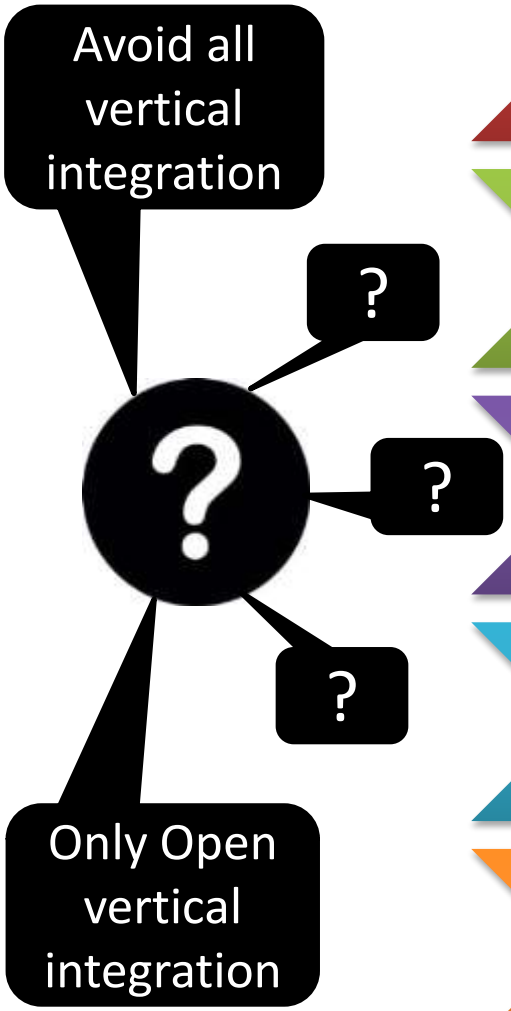

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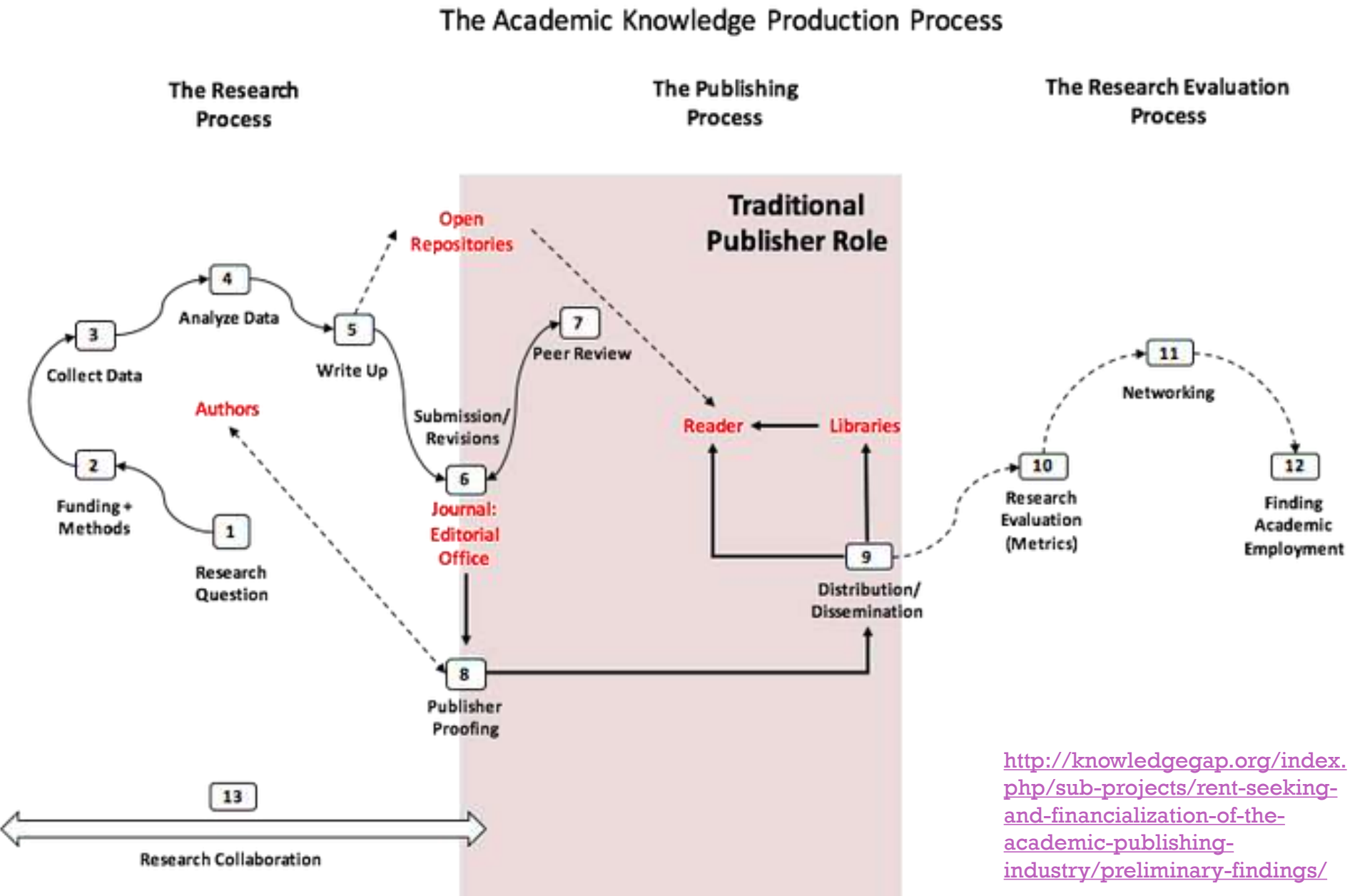
Risk of Workflow Lock-in

Schonfeld quotes:

- *Today almost no university is positioned to address its core interests here in any truly coherent way. The reason is essentially structural.*
- *If individual researchers determine that seamlessness is valuable to them, will they in turn license access to a complete end-to-end service for themselves or on behalf of their lab?*
- ***Fragmented decision-making cannot address issues of collective strategy.***
- *If academia can organize its work and develop a strategic vision for research workflow, there is yet an opportunity to avoid the negative consequences of outsourcing core scholarly infrastructure.*

+ Workflow lock-in – another take



http://knowledgegap.org/index.php/sub-projects/rent-seeking-and-financialization-of-the-academic-publishing-industry/preliminary-findings/

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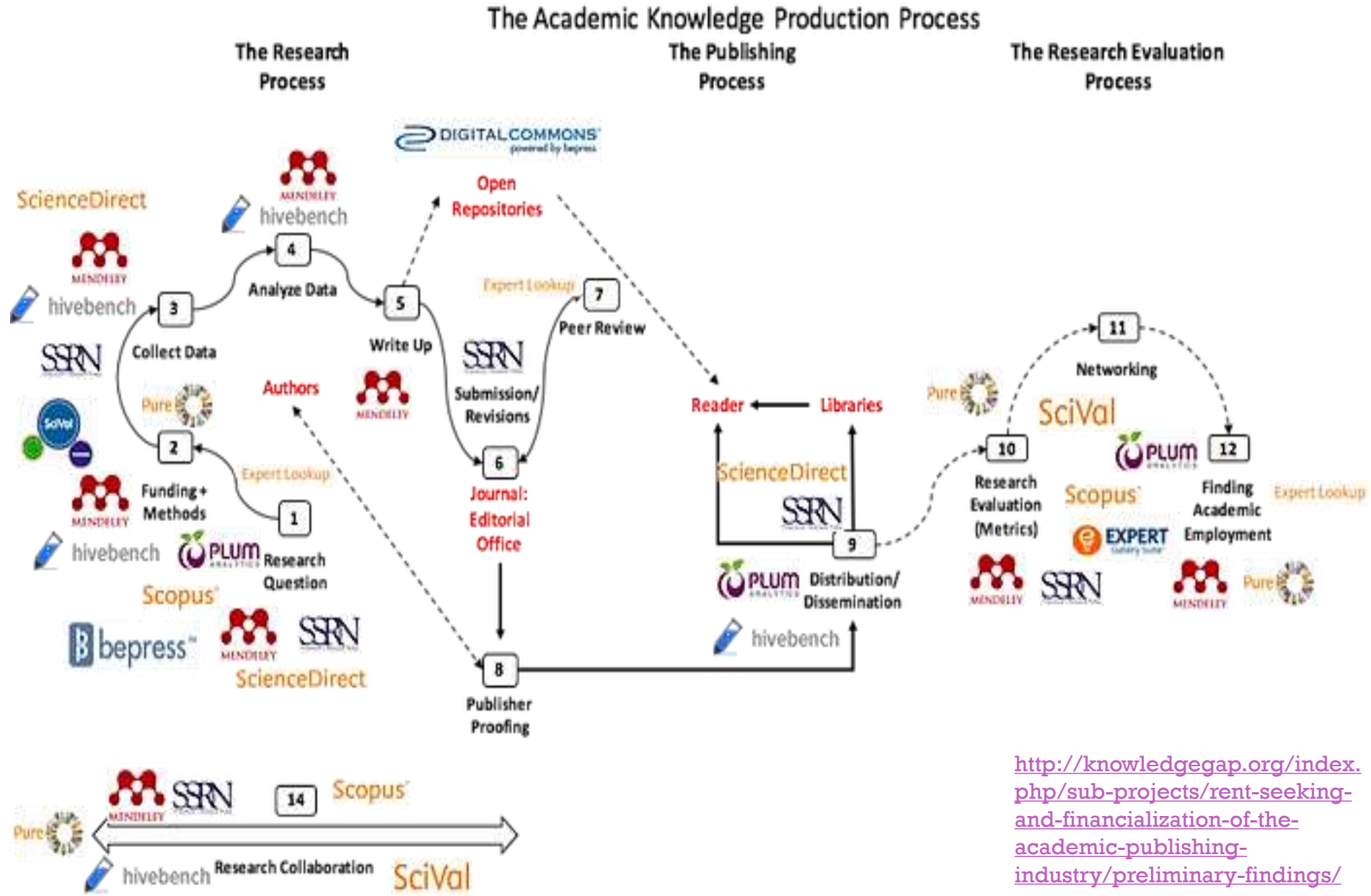

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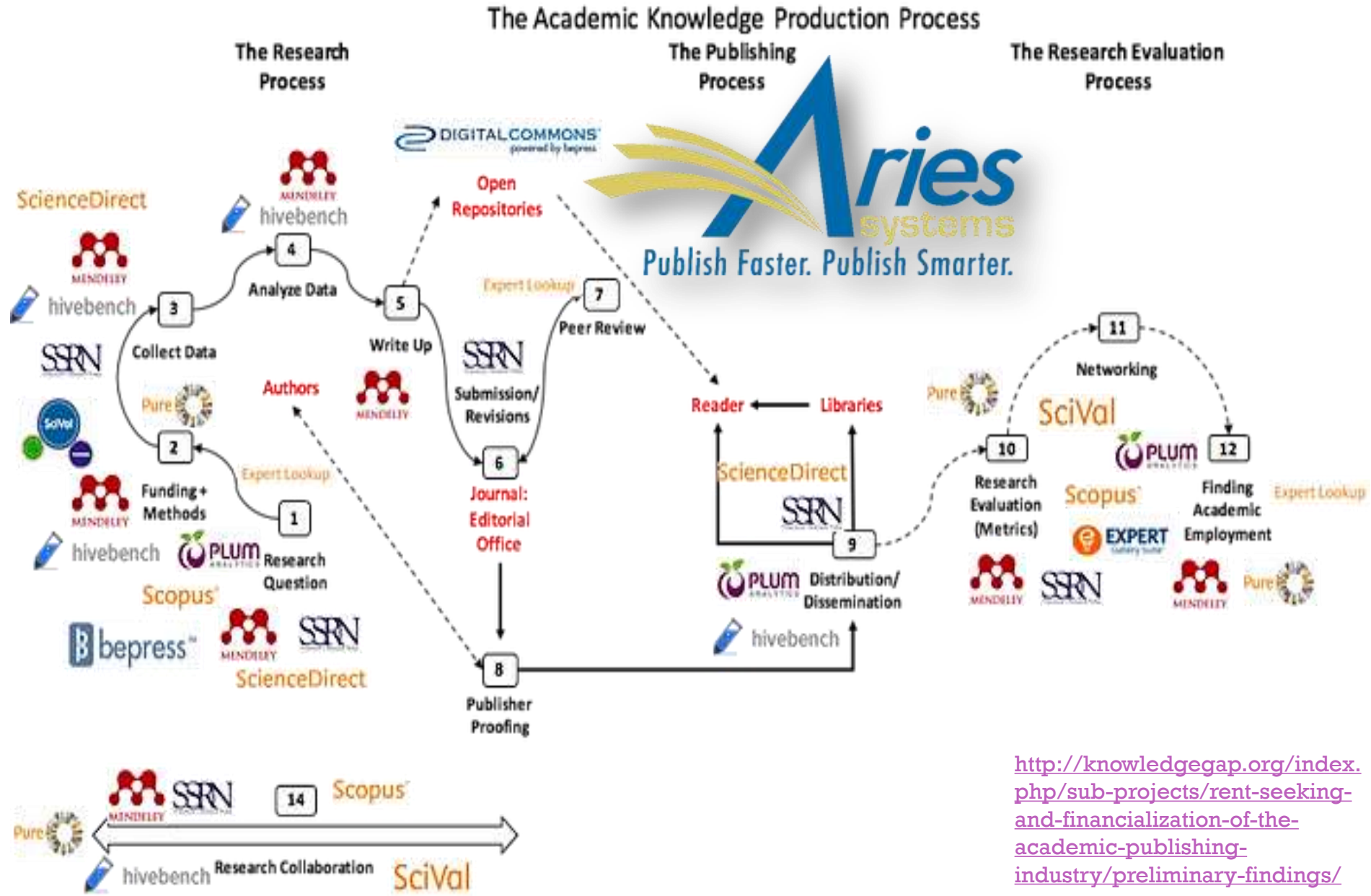

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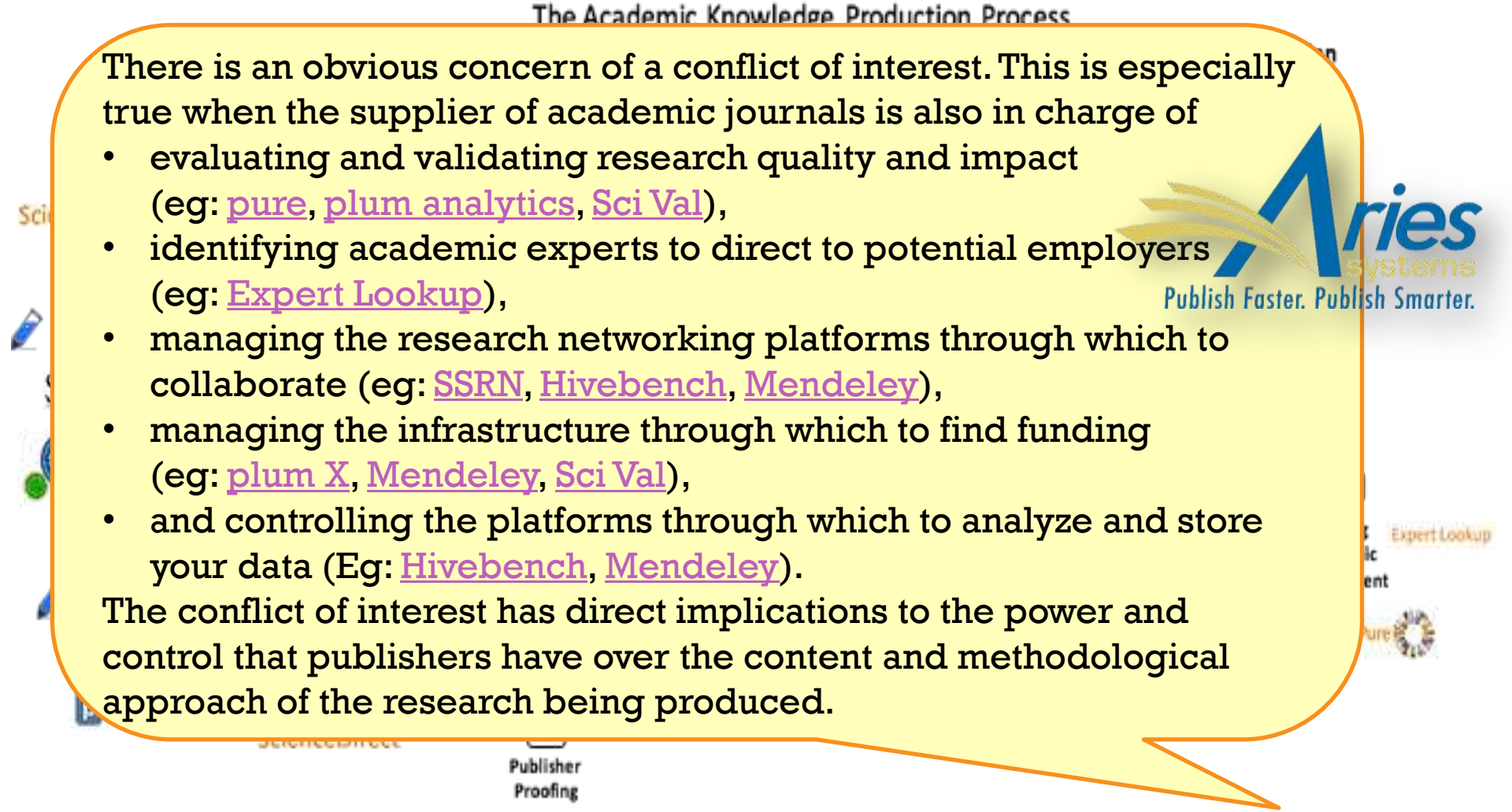


There is an obvious concern of a conflict of interest. This is especially true when the supplier of academic journals is also in charge of

- evaluating and validating research quality and impact (eg: pure, plum analytics, Sci Val),
- identifying academic experts to direct to potential employers (eg: Expert Lookup),
- managing the research networking platforms through which to collaborate (eg: SSRN, Hivebench, Mendeley),
- managing the infrastructure through which to find funding (eg: plum X, Mendeley, Sci Val),
- and controlling the platforms through which to analyze and store your data (Eg: Hivebench, Mendeley).

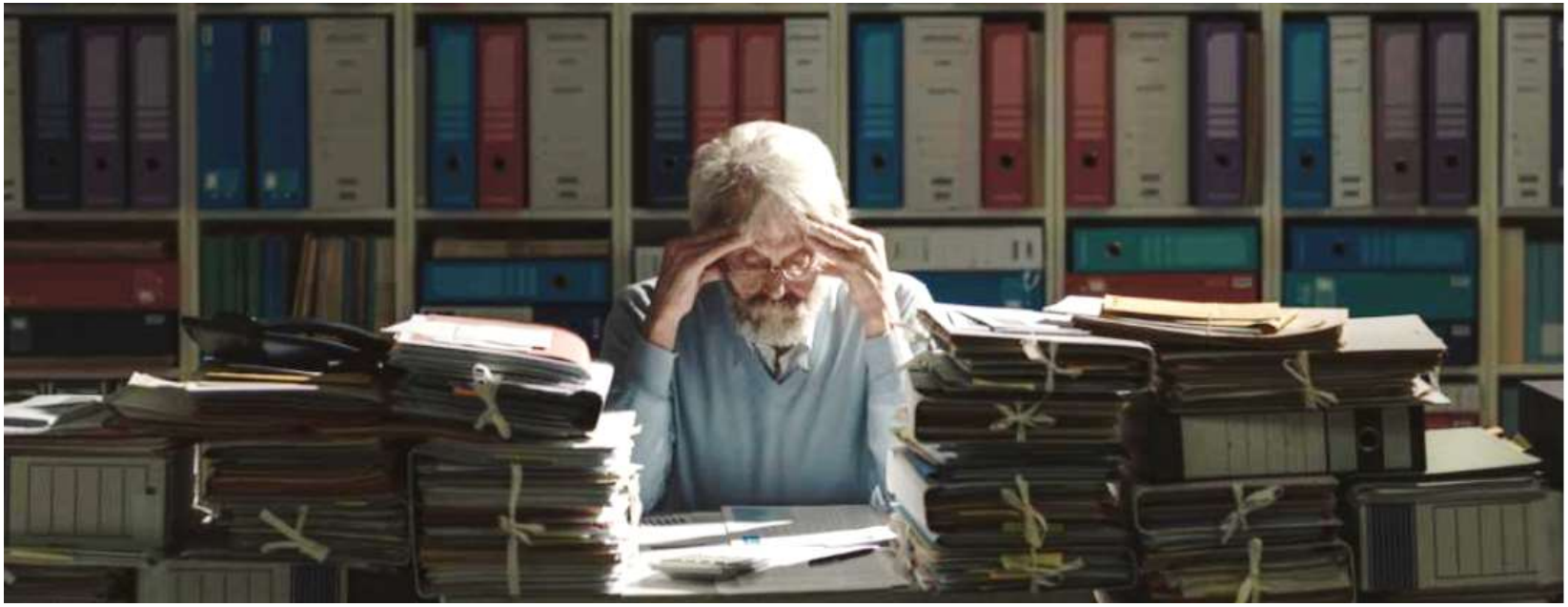
The conflict of interest has direct implications to the power and control that publishers have over the content and methodological approach of the research being produced.

http://knowledgegap.org/index.php/sub-projects/rent-seeking-and-financialization-of-the-academic-publishing-industry/preliminary-findings/

Forskere og universiteter bløder, mens forlagene skummer fløden

Videnskab.dk den 22. september 2018

- Universiteterne betaler store forlag uhyrlige summer for at få adgang til artikler, som universitetsansatte forskere har skrevet, rettet og kommenteret. Den model har universiteter i vore nabolande nu sagt stop til – hvornår følger Danmark trop?



The Guardian
Tue 27 Jun 2017

The long read

Is the staggeringly profitable business of scientific publishing bad for science?

It is an industry like no other, with profit margins to rival Google – and it was created

The Guardian

Political science Open access scientific publishing

Elsevier are corrupting open science in Europe

Elsevier - one of the largest and most notorious scholarly publishers - are monitoring Open Science in the EU on behalf of the European Commission. **Jon Tennant** argues that they cannot be trusted.

Jon Tennant

Fri 29 Jun 2018 16.00 BST

To the rescue ???

EUROPEAN UNIVERSITY ASSOCIATION

C-3 2018 (Brussels, 26 October)
Item 6

TOWARDS A MORE TRANSPARENT AND COMPETITIVE ACADEMIC PUBLISHING MARKET IN EUROPE AND BEYOND

The European University Association (EUA), representing 800 universities over Europe and 33 National Rectors Conferences, is very concerned about possible irregularities concerning pricing and market conditions in the research publishing sector. We find that the current lack of transparency and competition is harmful to knowledge dissemination and the progress towards a European science system based on Open Science.

➔ More info soon


OPEN SCIENCE:
JUST SCIENCE DONE RIGHT