Open Science
in a European Perspective

Ron Dekker
Director CESSDA (from 1 March) Consortium of European Social Science Data Archives
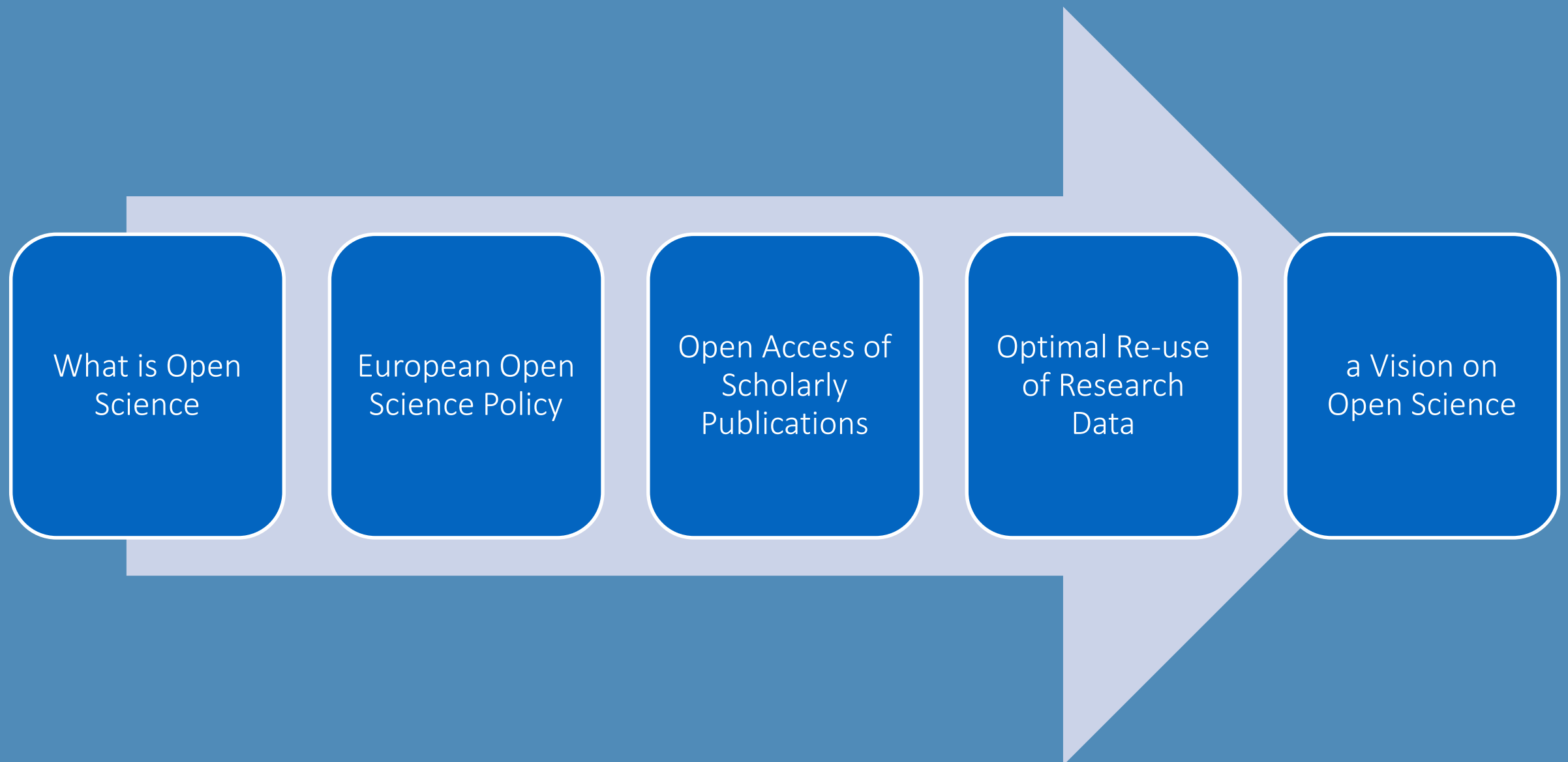Seconded National Expert on Open Science at the European Commission – DG Research & Innovation
[opinions are my own]

before that
- Project leader Open Science at the Ministry for Education, Culture and Science – for the EU Presidency
- Director for Institutes at NWO (NL Research Council) – for setting up Open Science Policy

SPARC® Japan
SPARC : Scholarly Publishing and Academic Resources Coalition

Outline

What is Open Science

European Open Science Policy

Open Access of Scholarly Publications

Optimal Re-use of Research Data

a Vision on Open Science

Ron Dekker

Open Science

Science is an integral part of our economic and social systems. As such it fuels new knowledge into innovation and society at large, creating novel ideas and perspectives.

Especially in the digital information-based economy where information is becoming a salient input factor for improved products and services, the connection between science and society at large becomes more and more important.

Open science is about a systemic change in the way science is performed. This encompasses the entire research cycle: from first ideas and concepts until its publication and dissemination.

Open Science – irrevocable

The way we do science will change, because of

- Digitization
  Data availability (exponential growth)
- Need for transparency and reproducibility
  Accountability, responsiveness and transparency
- Need to better connect with society at large
  Including involvement of citizens; Digital Natives
- Need to tackle grand challenges
  Complex societal problems

Open Science – concept
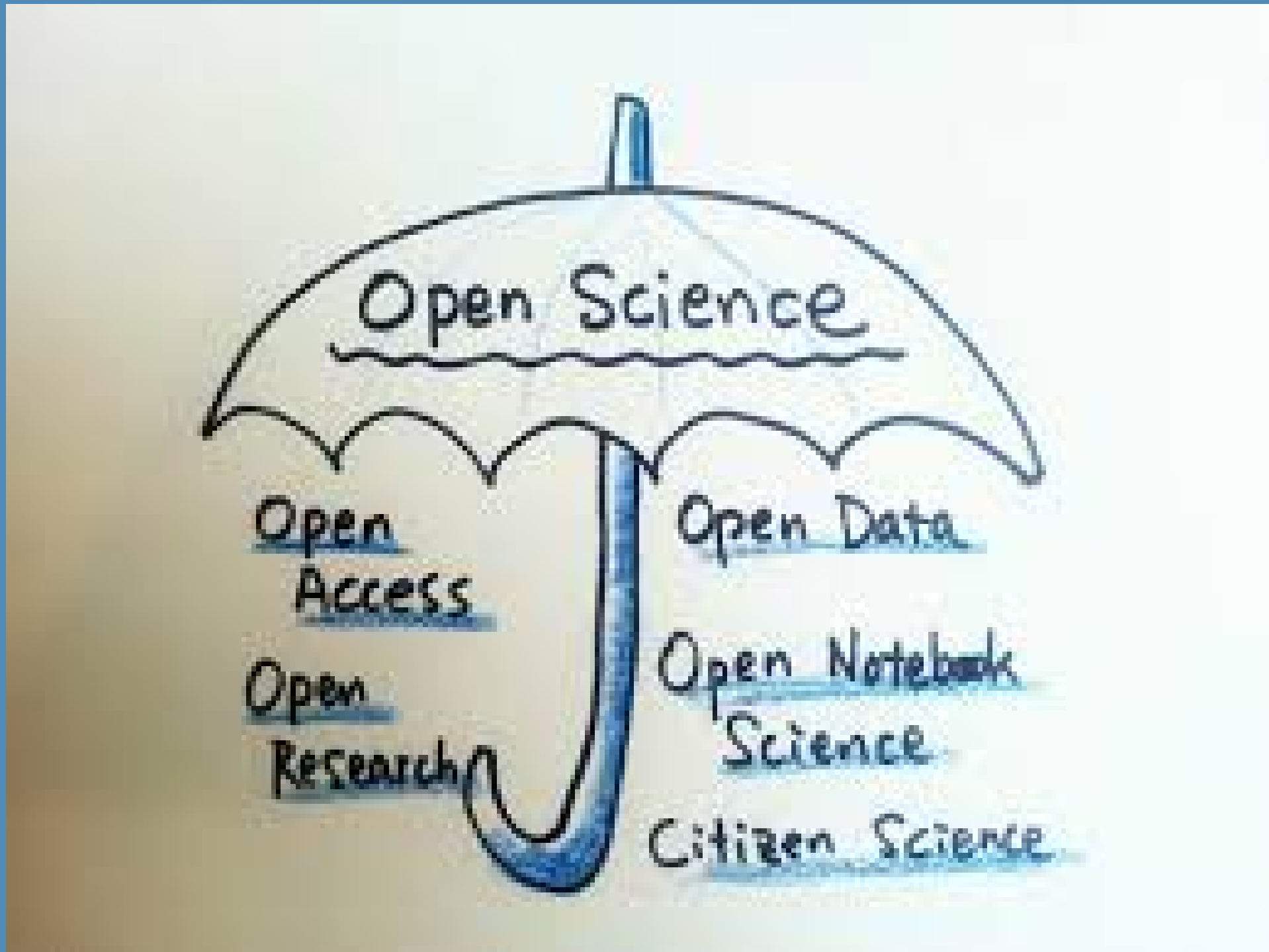
Open Science – definition

Michael Nielsen (quantum physicist):

"Open science is the idea that scientific knowledge of all kinds should **be openly shared** as early as is practical in the discovery process."

scientific knowledge of all kinds: includes journal articles, data, code, online software tools, questions, ideas, and speculations; anything which can be considered knowledge.

as is practical: very often there are other factors (legal, ethical, social, etc) that must be considered.

6

Ron Dekker

Open Science – it's real
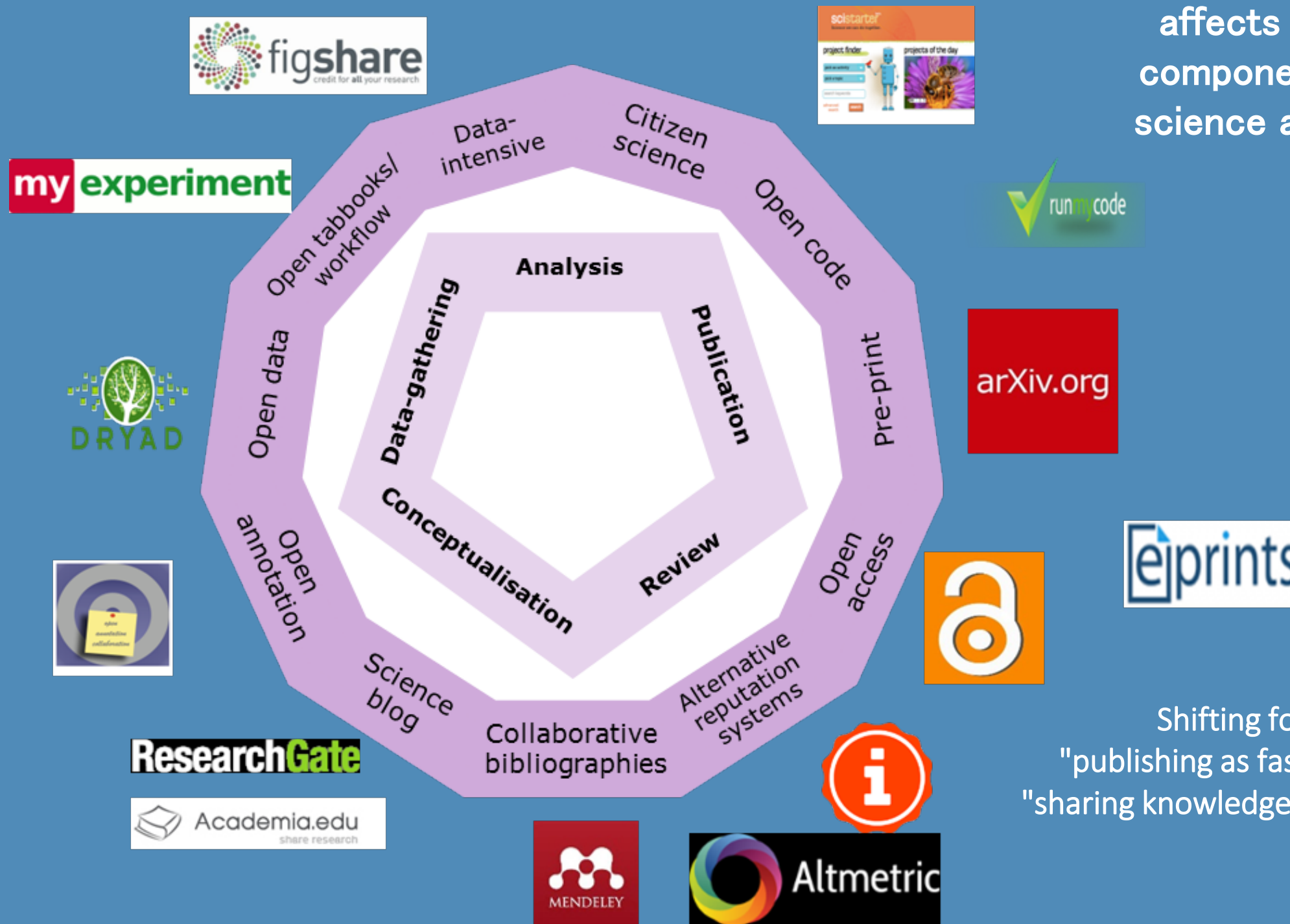
affects virtually all components of doing science and research

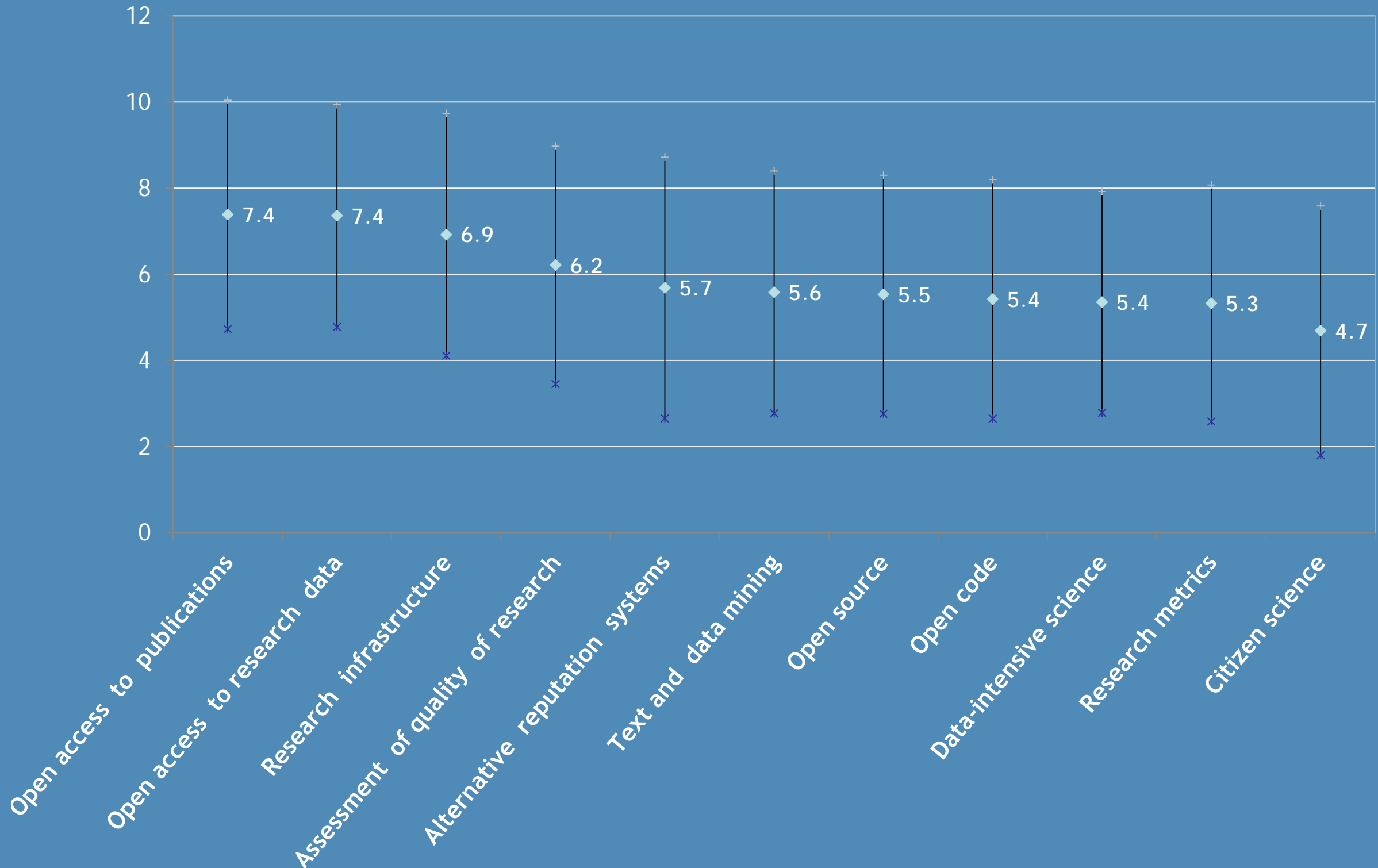Shifting focus from "publishing as fast as possible" to "sharing knowledge as early as possible

7

Ron Dekker

European Open Science Policy

EC Consultation – key drivers

On what issues a need for policy intervention?

Chart showing values with error bars for each category:

- Open access to publications: 7.4
- Open access to research data: 7.4
- Research infrastructure: 6.9
- Assessment of qualitaion of research: 6.2
- Alternative reputation systems: 5.7
- Text and data mining: 5.6
- Open source: 5.5
- Open code: 5.4
- Data-intensive science: 5.4
- Research metrics: 5.3
- Citizen science: 4.7

Ron Dekker

EC Consultation – key barriers

Over 80% agree/totally agree
    Quality assurance
    Lack of credits
    Lack of infrastructures
    Limited awareness of benefits

Less than 70% agree/totally agree
    Concerns about ethical and privacy issues

Ron Dekker

Open Science – priorities

Extensive stakeholder consultation

- ✓ Public consultation (July–September 2014)
- ✓ Validation workshops (October–December 2014)
- ✓ Final report (February 2015): http://ec.europa.eu/research/consultations/science-2.0/science_2_0_final_report.pdf

Broad consensus on key policy action lines

Strong support by Member States and Council

- ✓ Policy debate & Council conclusions 'data-driven economy' May 2015
- ✓ Presidency conference Open Science & Council Conclusions 'open science') May 2016

Reflected in EC's top priorities

- ✓ Included in the Digital Single Market strategy May 2015
- ✓ European Open Science Agenda May 2015
- ✓ High Level Expert Groups
- ✓ Open Science Policy Platform

Sander Dekker – NL

Carlos Moedas – EC

Ron Dekker

Dutch EU Presidency 2016-I

Focus on Publications and Data

Results (deliverables):

- **European Research Area Committee (member states)**
  ERAC Taskforce Report on Open Data

- **Open Science Conference Amsterdam**
  Amsterdam Call for Action on Open Science
  www.openaccess.nl/en/events/amsterdam-call-for-action-on-open-science

- **Competitiveness Council**
  Conclusions on Transition to Open Science System
  www.data.consilium.europa.eu/doc/document/ST-9526-2016-INIT/en/pdf

Ron Dekker

ERAC Task Force on Optimal Reuse of Research Data

TRAINING OF STAKEHOLDERS AND AWARENESS RAISING

1. Promote a better understanding of open research data

2. Establish training and education programs on Open Science

3. Establish a reward system for data sharing activities

4. Ensure sound monitoring

DATA QUALITY AND MANAGEMENT

5. Make data identifiable and citable

6. Promote metadata standardisation and production of metadata

7. Promote innovative models for peer-review and quality assurance

8. Strongly promote the use of data management plans

SUSTAINABILITY AND FUNDING

9. Ensure the existence of FAIR open research data infrastructures

10. Ensure funding for open research data and for data sharing activities

LEGAL ISSUES

11. Make IPR issues insightful

13

Ron Dekker

Amsterdam Call for Action

Two important pan-European goals for 2020:

1. Full open access for all scientific publications
2. A fundamentally new approach towards optimal reuse of research data

Flanking policies

3. New assessment, reward and evaluation systems

4. Alignment of policies and exchange of best practices

Amsterdam Call for Action on Open Science

nlEU 2016

Amsterdam Call for Action

Removing barriers to open science

1. Change assessment, evaluation and reward systems in science
2. Facilitate text and data mining of content
3. Improve insight into IPR and issues such as privacy
4. Create transparency on the costs and conditions of academic communication

Developing research infrastructures

5. Introduce FAIR and secure data principles
6. Set up common e-infrastructures

Fostering and creating incentives for open science

7. Adopt open access principles
8. Stimulate new publishing models for knowledge transfer
9. Stimulate evidence-based research on innovations in open science

Mainstreaming and further promoting open science policies

10. Develop, implement, monitor and refine open access plans

Stimulating and embedding open science in science and society

11. Involve researchers and new users in open science
12. Encourage stakeholders to share expertise and information on open science

Ron Dekker

5. Introduce FAIR and secure data principles

The problem

Research outputs generated with public funding should be accessible for reuse. In the scientific process, many different kinds of output are generated, depending on the scientific discipline, the sources of data and the type of analyses that researchers perform. For sharing and reusing data in the open science environment, it is important to provide clarity about the quality of the data offered and to have effective agreements in place for better reuse of data. If data is to be archived and made suitable for reuse, it must be clear to third parties how the data is structured and what information it contains.

The solution

- Develop Principles & Guidelines for Data Management Plans and data stewardship.
- Create optimal conditions for sharing research output by introducing a quality hallmark for the FAIR principles, data, and data management requirements: research output should be Findable, Accessible, Interoperable and Reusable.

Concrete actions

- **National authorities and the European Commission:** state that research output produced with public funding should, in principle, be accessible for reuse. Promote the FAIR principles. Provide for a bottom-up and discipline-based approach and elaboration.

- **National authorities and Research Performing Organisations:** put in place an institutional data policy which clarifies institutional roles and responsibilities for research data management and data stewardship.

- **Research funders:** implement Data Management Plans (DMPs) as an integral part of the research process, make them a precondition for funding, standardise them and make the costs incurred eligible for funding.

- **Research funders:** introduce positive incentives for FAIR data sharing by valuing data stewardship and efforts to make data available and by acknowledging and rewarding those who compile the data. Require data to be cited according to international standards. Encourage the sharing of expertise that enables disciplines/regions to learn from each other.

- **Research funders:** set the default in data sharing to open access, but allow a choice of access regimes: from open and free downloads to application and registration-based access. Conditions can be dependent on the nature of the data, common practice within a specific academic discipline, legal (privacy) frameworks, and legitimate interests of the parties involved.

- **National authorities and research funders:** educate data stewardship experts, recognise their profession and provide them with career opportunities. They will act as a bridge between IT and science.

Expected positive effects

- Increased quality of research;
- Better adherence to the principles of good scientific research and conduct to foster research integrity;
- Increased impact of publicly funded research;
- Secure sharing and reuse of research outputs, which will foster science and innovation.

Ron Dekker

Competitiveness Council Conclusions

Council Conclusions aligned with

- *A'dam Call for Action*
- *EC Open Science Agenda*

- Stress the importance of Open Science

- Open Science Policy Platform and European Open Science Agenda

- Removing barriers and fostering incentives

- Open access to scientific publications

- Optimal reuse of research data

Council of the European Union

Brussels, 27 May 2016
(OR. en)

9526/16

RECH 208
TELECOM 100

OUTCOME OF PROCEEDINGS

From:	General Secretariat of the Council
To:	Delegations
No. prev. doc.:	8791/16 RECH 133 TELECOM 74
Subject:	The transition towards an Open Science system
	- Council conclusions (adopted on 27/05/2016)

Delegations will find in the annex the Council conclusions on the transition towards an Open Science system, adopted by the Council at its 3470th meeting held on 27 May 2016.

17

- Stress the importance of Open Science
    1. Open Science as an ongoing transformation
    2. Potential to increase benefits of science
    3. Focus on Publications & Data

- Open Science Policy Platform and Open Science Agenda
    4. Open Science Policy Platform; Start initiatives; Inform each other
    5. Further develop the European Open Science Agenda

- Removing barriers and fostering incentives
    6. Results open ASAP; Remove legal barriers
    7. Impact to Science and Society; QA; Reward Systems; Data Citation
    8. TDM for All
    9. Retain Copyright, use Licensing Models

Ron Dekker

- Open access to scientific publications
    - 10. Open Access as point of departure; common principles
    - 11. Compliance on Open Access
    - 12. Open Access in 2020; Funding of new Models; Common Principles
    - 13. Set Milestones; Monitoring; Facilitate Information Sharing

- Optimal reuse of research data
    - 14. Optimal reuse as point of departure; data as public good
    - 15. Open by default; promote data stewardship; implement Data Mgmnt Plans
    - 16. FAIR & Safe Data
    - 17. European Open Science Cloud

- Follow-up
    - 18. Advocate Open Science; Coordinate Activities & Information

Ron Dekker

From Vision to Action

- **Open Science Agenda**

- **High Level Expert Groups**

- **Open Science Policy Platform**

- **EC Programmes H2020/FP9**

Ron Dekker

EC Open Science Agenda

Fostering and creating incentives for Open Science
Open Science in education programmes and best practices
Extending the input of knowledge producers in an open environment
It is also about the quality, impact and research integrity of science

Removing barriers for Open Science
includes a review of researchers' careers with a view on creating incentives and awarding researchers for engagement with Open Science

Developing research infrastructures for Open Science
Improve data hosting, access and governance

Mainstreaming and further promoting
Open Access policies to research data and publications

Embedding Open Science in society as a socio-economic driver
Open Science becomes instrumental in making science more responsive to societal and economic expectations.

Ron Dekker

EC Open Science Agenda – 8 key issues

1. Reward systems

2. Measuring quality and impact (altmetrics)

3. Future of publishing models

4. FAIR open data

5. European Open Science Cloud

6. Research integrity

7. Citizen Science

8. Open education and skills

Ron Dekker

EC Open Science Agenda – 8 key issues

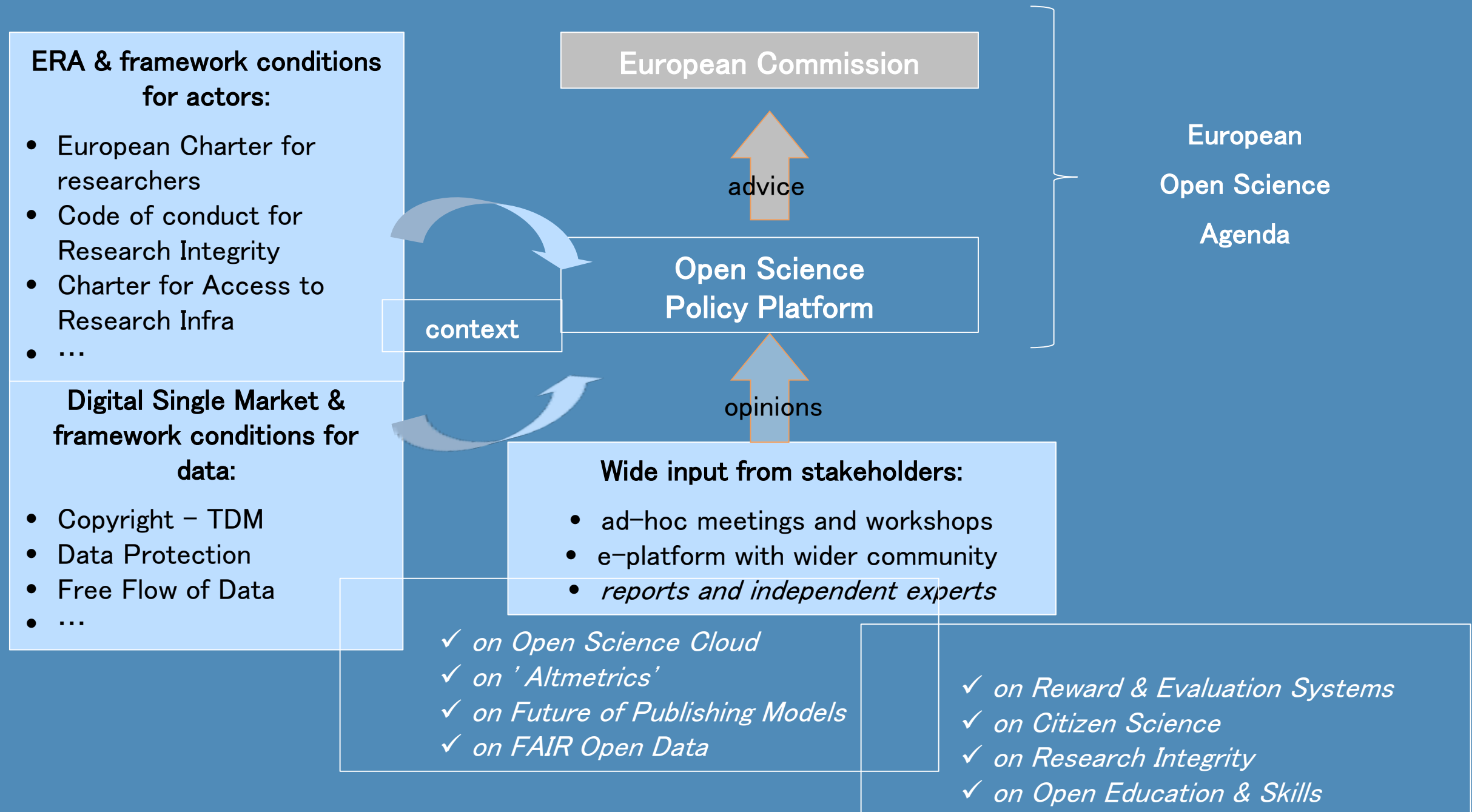1. Reward systems

2. Measuring quality and impact (al

3. Future of publishing

4. FAIR o

5. **EC installed/will install 8 High Level Expert Groups**
   EC installed Open Science Policy Platform science Cloud

6. ...arch integrity

7. Citizen Science

8. Open education and skills

Ron Dekker

Open Science Policy Platform

- **Catalyse the transition towards Open Science**
  - Advance Open Science in order to radically increase the quality and impact of European science

- **Identify the issues**
  - Work along the 8 priorities of the Open Science Agenda
  - Harvest & connect what's happening ' outside' (RDA, MS)
  - Make use of the expert groups, outside expertise, best practices, …
  - Set up/work on new ideas (Right of initiative)

- **Connect the issues**
  - Have an overarching view

Ron Dekker

Open Science Policy Platform

ERA & framework conditions for actors:

- European Charter for researchers
- Code of conduct for Research Integrity
- Charter for Access to Research Infra
- …

Digital Single Market & framework conditions for data:

- Copyright – TDM
- Data Protection
- Free Flow of Data
- …

European Commission

advice

Open Science Policy Platform

context

opinions

European

Open Science

Agenda

Wide input from stakeholders:

- ad-hoc meetings and workshops
- e-platform with wider community
- *reports and independent experts*

✓ *on Open Science Cloud*
✓ *on 'Altmetrics'*
✓ *on Future of Publishing Models*
✓ *on FAIR Open Data*

✓ *on Reward & Evaluation Systems*
✓ *on Citizen Science*
✓ *on Research Integrity*
✓ *on Open Education & Skills*

25

EC Programmes –
research publications open access

- Obligation to provide OA
  - either through the Green or Gold way
    in all areas; deposition mandatory either way

- As soon as possible, with max. embargoes:
  - 6 to 12 months (depending on discipline)

- Gold open access costs eligible for reimbursement
  - as part of the project budget while the project runs &
  - post-grant support being piloted through OpenAIRE

- Authors encouraged to retain copyright
  - grant licences instead

Ron Dekker

EC Programmes –
research data open by default

· **Horizon 2020 grantees are required to**

   · deposit underlying research data in a repository

   · take measures to grant access to the research data

· **Horizon 2020 grantees are encouraged to share datasets beyond publication**

· **FAIR data**

   · Findable + Accessible + Interoperable + Re-usable

Ron Dekker

Data Management Plan for projects

The Open Research Data Pilot has been extended
to cover all thematic areas of Horizon 2020
as of the Work Programme 2017

A Data Management Plan provides information on:
- The data the research will generate
- How to ensure its curation, preservation and sustainability
- What parts of that data will be open (and how)

International Dimension

Robust open access policies around the world

· US OA mandate for federally funded research
  agencies with budget of over 100 million $ (NIH, NSF, ···)

· Green OA mandate in Latin America (SCIELO)

· OA policies also in Canada, Australia, Japan...

· Developing policies in other countries,
  e.g. China, Russia, India, South Africa, Kenya

· Key non-state funders also have robust mandates
  Wellcome Trust, Gates Foundation (and ORFG), ...

Open Science and the G7

G7 Science and Technology Ministers' Meeting in Tsukuba, Ibaraki, May 2016

- **6: Open Science - Entering into a New Era for Science:**
- Putting into Practice New Framework of Research and Knowledge Discovery, Sharing, and Utilization through Openness
- We support taking the following actions:

i.   i. **Establish a working group** on open science with the aims of sharing open science policies, exploring supportive incentive structures, and identifying good practices for promoting increasing access to the results of publicly funded research, including scientific data and publications, coordinating as appropriate with the Organisation for Economic Co-operation and Development (OECD) and Research Data Alliance (RDA), and other relevant groups; and

ii.   ii. **Promote international coordination and collaboration** to develop the appropriate technology, infrastructure, including digital networks, and human resources for the effective utilization of open science for the benefit of all.

Open Science with the G20

- The G20 Science, Technology and Innovation Ministers Meeting of 4 November 2016 stated:

- 'We encourage discussion on open science and access to publicly-funded research results on findable, accessible, interoperable and re-usable (FAIR) principles in order to increase collaboration on science and research activities'.

Open Science and the G7 & OECD

G7-Autumn 2017, Italy

G7 scheduled to adopt statement on Open Science with special reference to global dimension of Open Science Cloud and Rewards for Researchers to engage with Open Science

Global Science Forum under the OECD is developing a framework for open and inclusive collaboration in Science in order to define future work priorities on Open Science
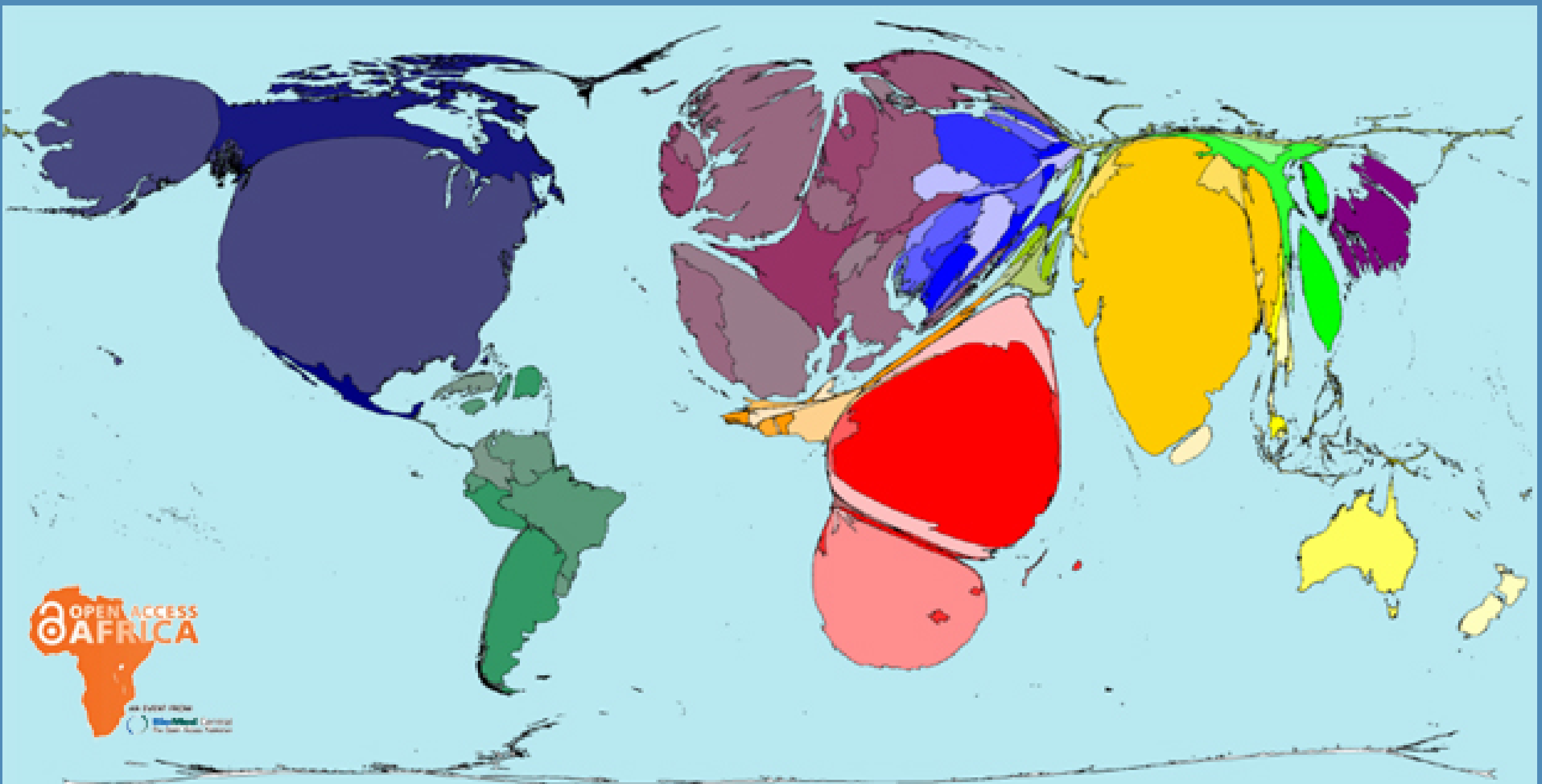
Open Access to Scholarly Publications
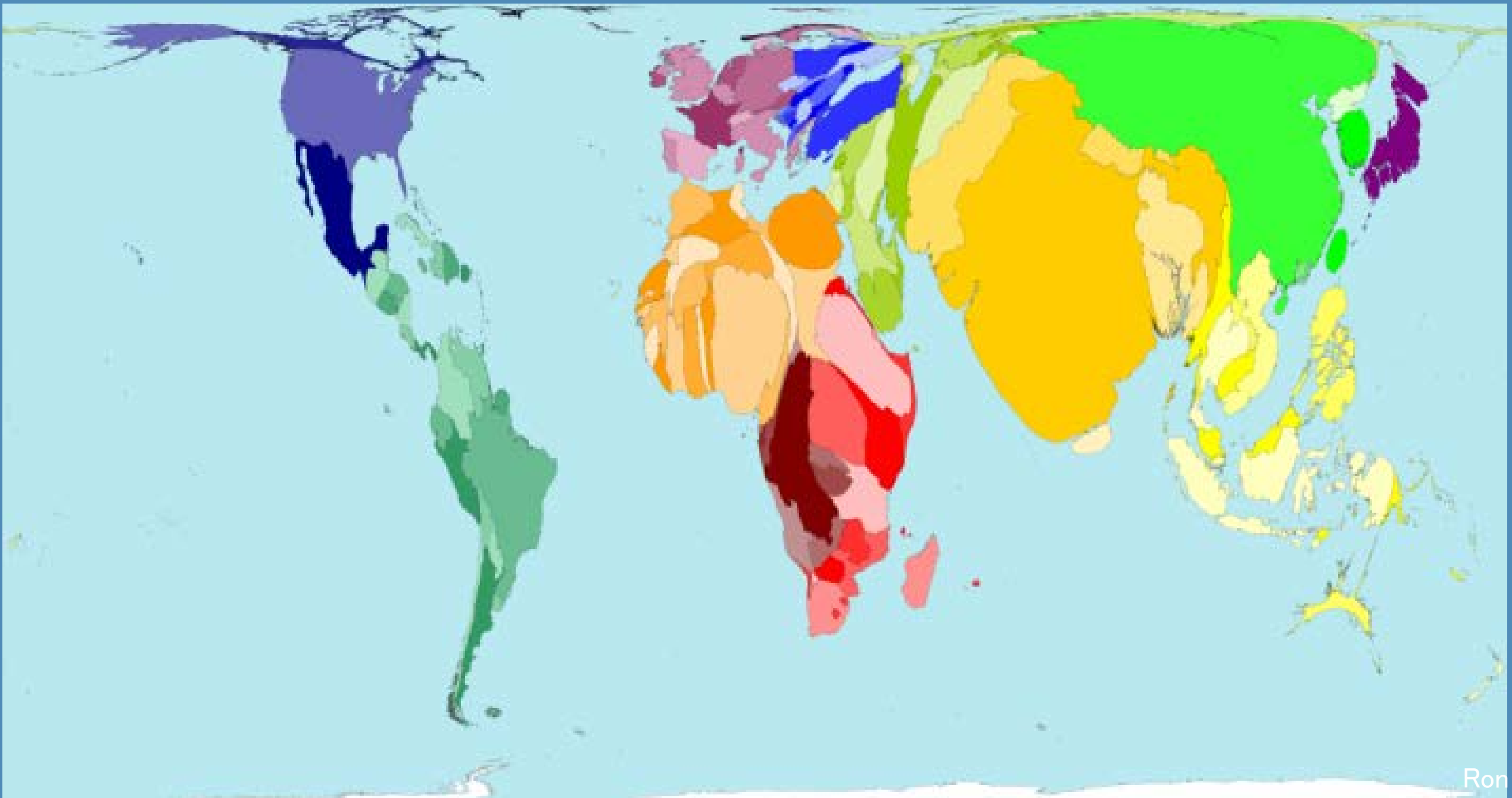
Ron Dekker

Open Access Activities

Map showing the number of activities by country along the SPARC-organised 4th edition of the Open Access Week 2010

Ron Dekker

Other countries will develop too

- closer to the markets ; better connect science to innovation

Population by 2050 (prof.Hans Rosling)

Ron Dekker

Publishing

Continent	Documents	Citable documents	% Cit. Docs	Citations	Self-citations	Net-citations	% Net Citations
AFRICA	109.941	100.925	4%	55.167	12.867	42.300	4%
ASIA	838.393	792.866	29%	337.914	162.511	175.403	18%
AUS/NZ	95.619	83.186	3%	62.288	18.214	44.074	4%
EUROPE	1.104.455	985.197	36%	682.043	198.312	483.731	48%
NORTH AMERICA	677.876	586.003	22%	412.225	205.436	206.789	21%
SOUTH AMERICA	170.129	159.226	6%	69.099	19.472	49.627	5%
TOTAL	2.996.413	2.707.403	100%	1.618.736	616.812	1.001.924	100%

Publishing

Country	Documents	Citable documents	% Cit. Docs	Citations	Self-citations	Net-citations	% Net Citations
US (1)	567.007	487.064	18%	346.567	188.398	158.169	16%
CHINA (2)	416.409	401.495	15%	168.552	105.917	62.635	6%
JAPAN (6)	109.305	100.143	4%	47.654	15.993	31.661	3%
NETHERLANDS (15)	51.434	45.227	2%	41.441	10.074	31.367	3%
TOTAL	2.996.413	2.707.403	100%	1.618.736	616.812	1.001.924	100%

Find your journal

- Ca. 35,000 active scholarly peer-reviewed journals in late 2014
  28,100 English + 6,450 non-English
  Collectively publishing about 2.5 million articles a year
  (source: STM 2015 report).

- Journal impact factors (JIF):
  JIF [10+]   75   journals
  JIF [5-9]   202   journals
  JIF [3-4]   364   journals
  JIF [2]   746   journals
  JIF [1]   2857 journals
  JIF [-0.99]   other   journals

http://www.scimagojr.com/journalrank.php

Nr. Title	JIF	#art '15
4. CA - A Cancer Journal for Clinicians	32.242	43
6. Ann Rev Astronomy and Astrophysics	27.065	16

What's wrong with current system?

- IP-address controlled access creates multiple markets
- JIF helps in creating a lock-in and have multiple monopolies
- Big Deals imply very high marginal costs of quitting a journal
→ High prices

- Lock-in by JIF:

   Stakeholders (mis)use JIF as a proxy for quality

   institutionalized in research assessment methods

   → only citation counts and journal names to assess impact
- Incentive: publish in high prestige journals instead of doing high-risk research
   →perverse incentive system

What's wrong with current system?

But it pays off, as it gives mutual benefits to researchers and publishers:

Researchers give to Publishers
- Copyright/ownership
  → abiltiy to collect value added via subscriptions
- Excellent articles that contribute to the value/ of the Journal

Publishers give to Researchers
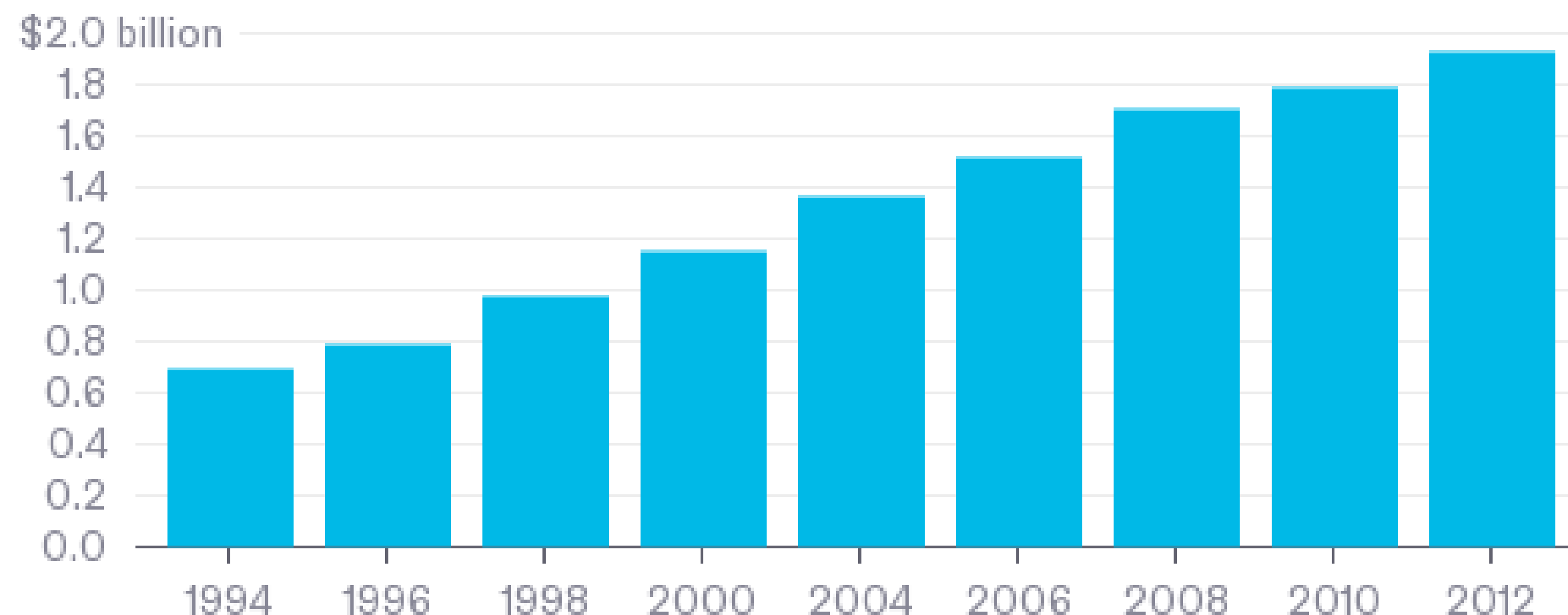- Reputation:
   Via Journal Impact Factor
      based on past performance of the journal
   Helps in getting/maintaining an academic career
      universities and funders use it for evaluations/granting
         →perverse incentive system

The Bill for Academic Journals Keeps Rising

Spending by U.S. university libraries on current serial subscriptions

BloombergView

Open Access – Why ?

Feasible

- Make full use of IT technology (copying & distributing at 0 cost)

Efficiency

- Universities face difficulties to pay the bill on subscriptions
- Funders want more return on their grants

   Impact becomes broader – it's about Transfer of Knowledge

      Scientific – Societal – Innovation

Principle

- Results of publicly financed research should be publicly available

We need it !

   Science and innovation are foundations for economic recovery, sustainable growth and jobs

   Open science is a means to improve connectivity and

   to be able to exchange knowledge more rapidly

- For the benefit of Science
- Better interaction with Society & Economy
- Improve on Integrity and Trust (and reproduciblity)

Open Access – What ?

Open Access instead of subscription-based models

- **Costs** of publishing are covered upfront
- Research articles are **immediately** available for everyone, free of financial and legal barriers

Different variants

- Gold OA: authors (often via funding bodies or institutions) pay
  - SCIELO/OpenLibHums/LingOA/SciPost: institutions pay
- Hybrid OA: journals offer both subscriptions and open access publishing
- Green: a copy of the article is deposited in a repository and becomes openly available, mostly after an embargo period

What OA is NOT

- Not an obligation to publish
- Not at odds with patenting
- No difference w.r.t. peer review process

Open Access – Policies

Bottom Line:
Most countries have an open access plan, and have set up a strategy

UK: gold and green; finance gold/hybrid to speed up the transition to OA; transition period still not ended → annual extra costs 20 M€

NL: immediate OA; offsetting agreements – without extra budget; almost 100% OA in very short timeframe; but is offsetting sustainable

EC: European Open Science Agenda; EC Grant Regulations – will get extra compliance

China: Green OA – allowing (12 month) embargoes
Reporting obligation for projects funded by national R&D programmes at the portal of the National S&T Report Service
Open Access Repositories

Gates Foundation: 1 pager with principles – no exceptions; immediate OA in 2017 after 2 years incubation period

Ron Dekker

Optimal Re-use of Research Data

#EUopendata

FAIR DATA

- Findable
- Accessible
- Interoperable
- Re-usable
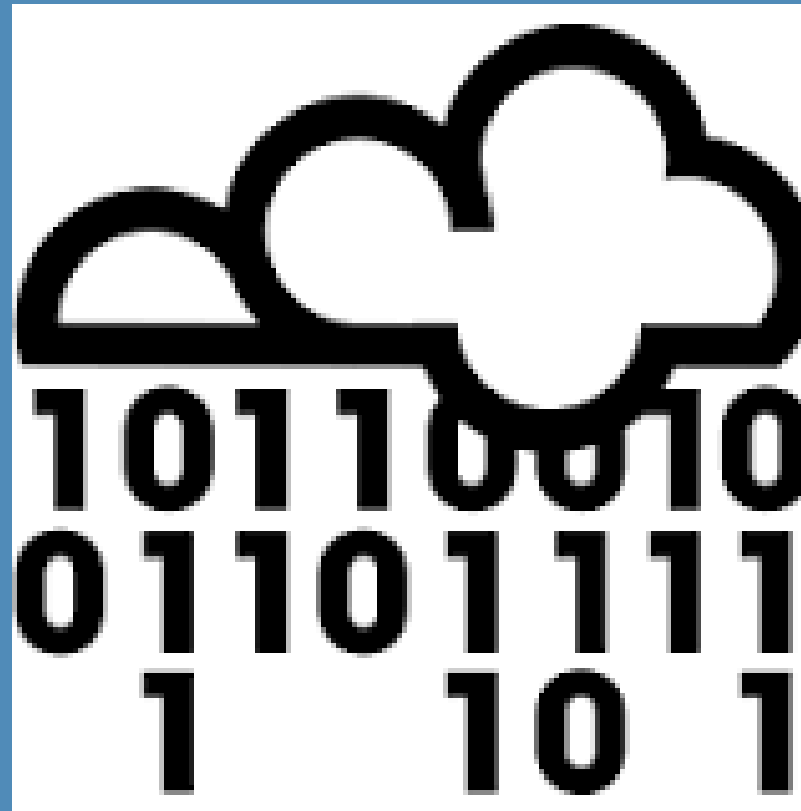
European Cloud Initiative
COM 2016/178/ (19 April 2016)

3 Pillars

European Open Science Cloud (EOSC)
- ✓ Integration and consolidation of e-infrastructures
- ✓ Federation of existing research infrastructures and scientific clouds
- ✓ Development of cloud-based services for Open Science
- ✓ Connection of ESFRIs to the European Open Science Cloud

European Data Infrastructure (EDI)
- ✓ Development and deployment of large-scale European HPC, data and network infrastructures

Widening access
- ✓ SMEs, Industry at large, Government

Ron Dekker

EOSC – What ?

European Open Science Cloud is part of Europe´s ambition to **support the transition to Open Science** and make the most of **data-driven science**.

- Strongly stated need:
    it's cost-effective, and privacy & IPR-conscious
- Virtual environment for all European researchers
    to store, manage, analyse and re-use data
- Federation of existing and emerging data infrastructures
- Added value:
    scale, data-driven science, inter-disciplinary,
    data – to – knowledge – to – innovation

EOSC – Report

Publication of the report of the
High Level Expert Group
on the European Open Science Cloud
(October 2016)

Including recommendations on
Policy, Governance and Implementation

http://ec.europa.eu/research/openscience/index.cfm?pg=open-science-cloud

Governance layer

- Bottom-up governance
- Federation
- Legacy and sustainability
- Leverage of MS investment
- Trust

Data and service layer

- IPR and privacy protection
- Big data analytics
- Data fusion across disciplines
- High performance computing
- Data access and re-use
- Data manipulation and export
- Data discovery and catalogue

Infrastructure layer

- High-speed connectivity
- Super-Computing
- Data storage

Physics

Life sciences

Earth sciences

Applied – engineering

Economics

......

Social sciences

Humanities

Citizen science

Scale of scientific activity (data-driven science)
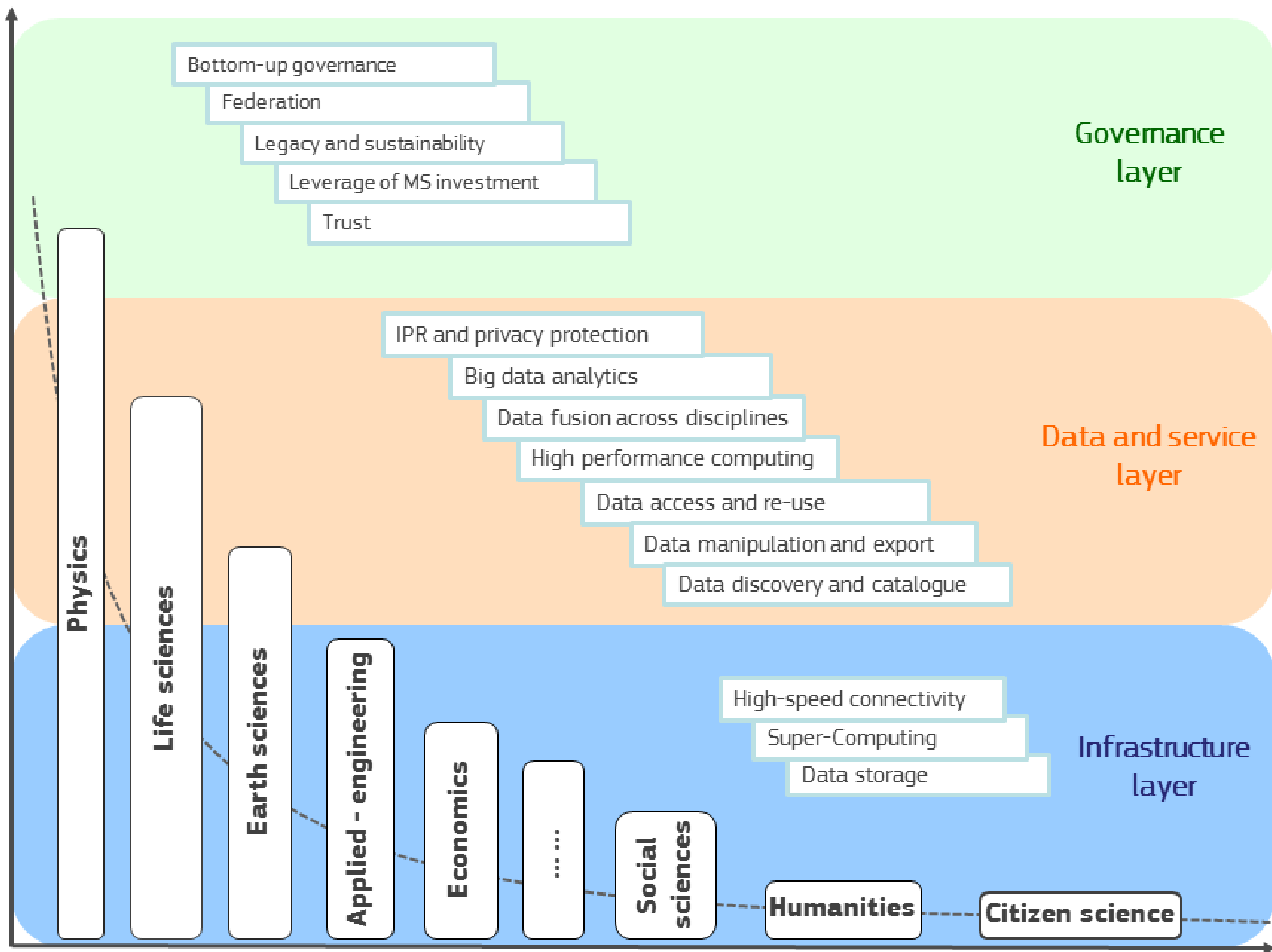
Lead scientific users...   ...long tail of science

FAIR concept

- **Findable**

  Easy to find by both humans and computer systems

  Based on mandatory description of the metadata;

- **Accessible**

  Stored for long term

  Easy access /download well-defined license and access conditions

  At the level of metadata, or at the level of the actual data content

- **Interoperable**

  Ready to be combined with other datasets

  By humans as well as computer systems

- **Reusable**

  Ready to be used for future research

FAIR operationalised – DANS.NL

Consider F, A, I as separate dimensions of data quality

· Score each dimension on a 1-5 scale

· Make scoring as automated as possible

· or data archivists score at the ingest of the data

· Consider Reusability as the **resultant** of F, A, I

· R = (F+A+I)/3

Clouds are already existing

NIH Commons

NSF Open Science Data Cloud

Microsoft Azure

Amazon Web Services

Software: Services & Tools
App store/User Interface
scientific analysis tools/workflows
Services: APIs, Containers, Indexing,

Data
"Reference" Data Sets
User defined data

Compute Platform: Cloud or HPC

Digital Object Compliance
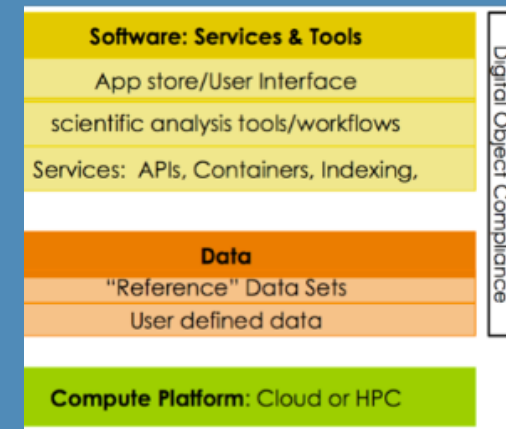
NIH Commons Framework Working Group

OSDC
OPEN SCIENCE DATA CLOUD

PIRE
PARTNERSHIP FOR INTERNATIONAL RESEARCH AND EDUCATION

amazon web services™ | S3

Microsoft Azure

Data Seal of Approval

Data Seal of Approval

Ensure that data:

· Can be found on the Internet

· Are accessible (clear rights and licenses)

· Are in a usable format

· Are reliable

· Are uniquely identified

www.DANS.KNAW.nl

It's a cultural challenge

How to bring trust, create a safe & secure environment

How to stimulate sharing data

How to realise authentication of data producers, of users

How to ensure quality of the data

How to deal with sensitive data

A Vision on Open Science

Open **Innovation**
Open **Science**
Open to the **World**

Ron Dekker

STM
Tech Trends

2015

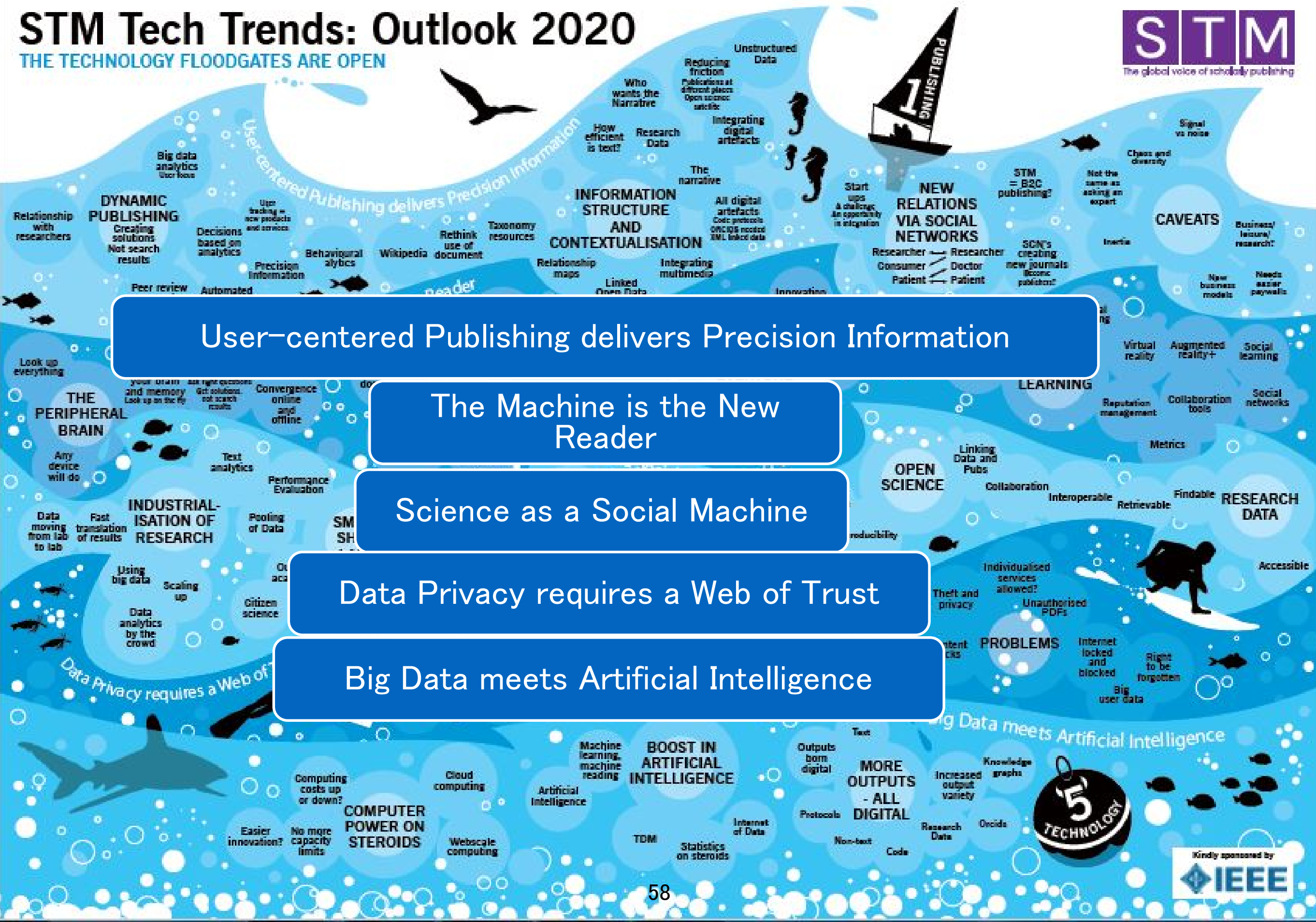# STM Tech Trends: Outlook 2020
THE TECHNOLOGY FLOODGATES ARE OPEN

STM Tech Trends: Outlook 2020
THE TECHNOLOGY FLOODGATES ARE OPEN

User-centered Publishing delivers Precision Information

The Machine is the New Reader

Science as a Social Machine

Data Privacy requires a Web of Trust

Big Data meets Artificial Intelligence

Platform Strategy

Move from Pipelines to Platforms

- From resource control

  to resource orchestration

- From internal optimisation

  to external interaction

- From focus on customer value

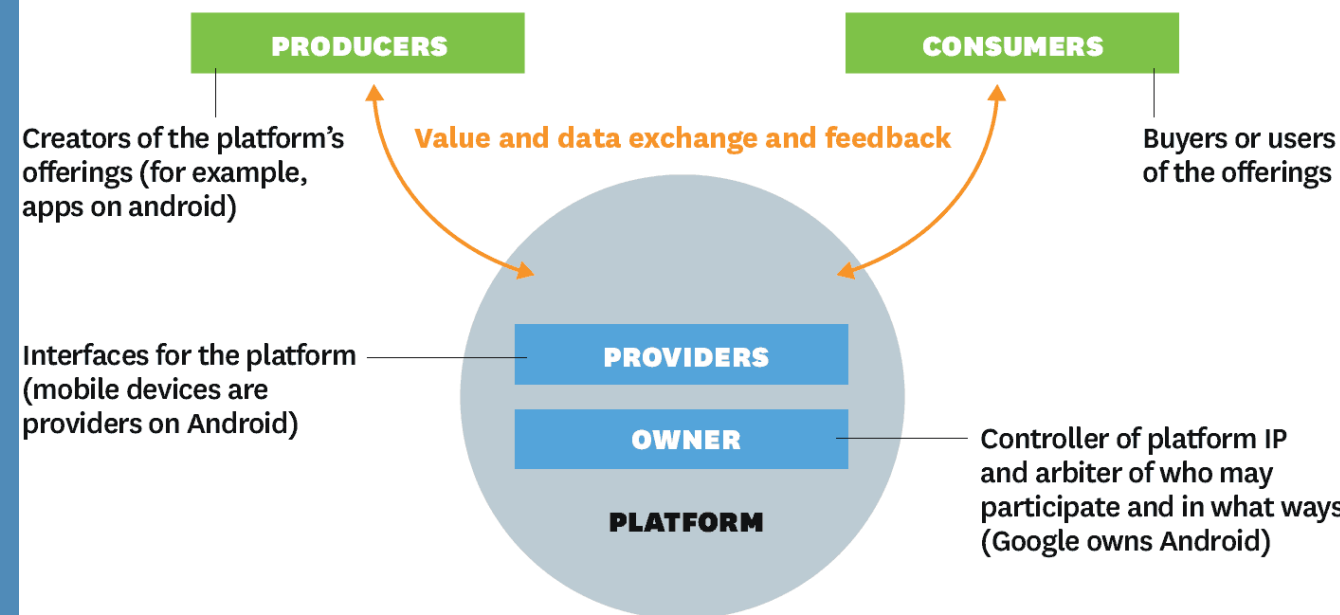 to focus on ecosystem value

4 (main) players

- Owner, Provider(s), Producers, Consumers/Users

The focus shifts to interactions – exchanges of value between producers and consumers on the platform

The Players in a Platform Ecosystem

A platform provides the infrastructure and rules for a marketplace that brings together producers and consumers. The players in the ecosystem fill four main roles but may shift rapidly from one role to another. Understanding the relationships both within and outside the ecosystem is central to platform strategy.

PRODUCERS — Creators of the platform's offerings (for example, apps on android)

CONSUMERS — Buyers or users of the offerings

Value and data exchange and feedback

PROVIDERS — Interfaces for the platform (mobile devices are providers on Android)

OWNER — Controller of platform IP and arbiter of who may participate and in what ways (Google owns Android)

PLATFORM

SOURCE MARSHALL W. VAN ALSTYNE, GEOFFREY G. PARKER, AND SANGEET PAUL CHOUDARY
FROM "PIPELINES, PLATFORMS, AND THE NEW RULES OF STRATEGY," APRIL 2016
© HBR.ORG

101 Innovations

Bianca Kramer & Jeroen Bosman (and you?)

400+ Tools and innovations in scholarly communication

https://docs.google.com/spreadsheets/d/1KUMSeq_Pzp4KveZ7pb5rddcssk1XBTiLHniD0d3nDqo
friendly URLhttp://bit.ly/innoscholcomm-list

Scholarly Publishing Process

Research

Write article

Submit to Journal

waive ©

Peer review

Revision by authors

Article Accepted

Publishing

Publication accessible via subscription (paywall)

New research builds on published results

Ron Dekker

Scholarly Publishing Process – Paywalled

New research builds on published results

Research

Write article

Submit to Journal

waive ©

Peer review

Revision by authors

Article Accepted

Publishing

Publication accessible via subscription (paywall)
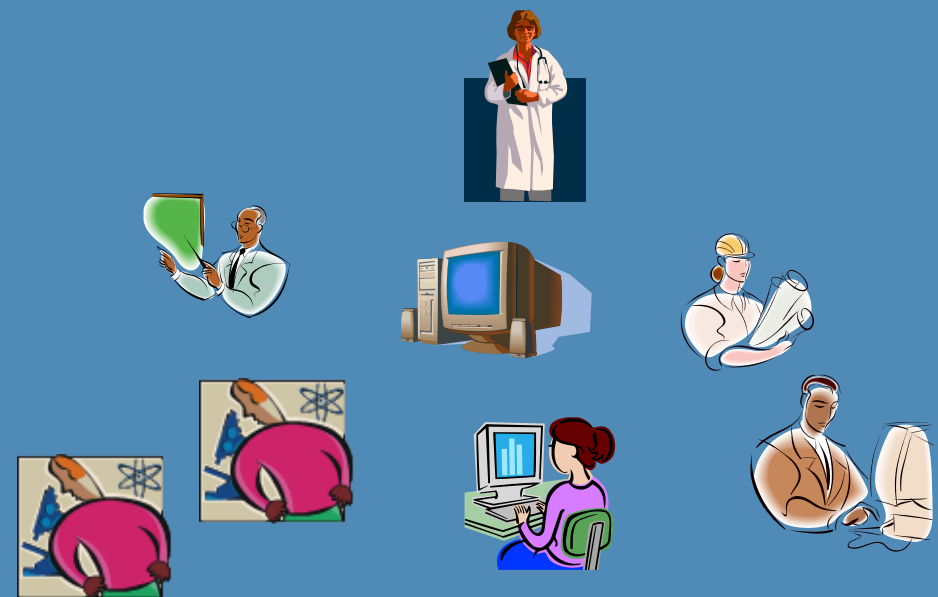
Scholarly Publishing Process – Green OA

New research builds on published results

Research

Write article

Submit to Journal

waive ©

Peer review

Revision by authors

Article Accepted

Publishing

Publication accessible via subscription (paywall)

Repository

Access is maximized, but could be delayed or other version
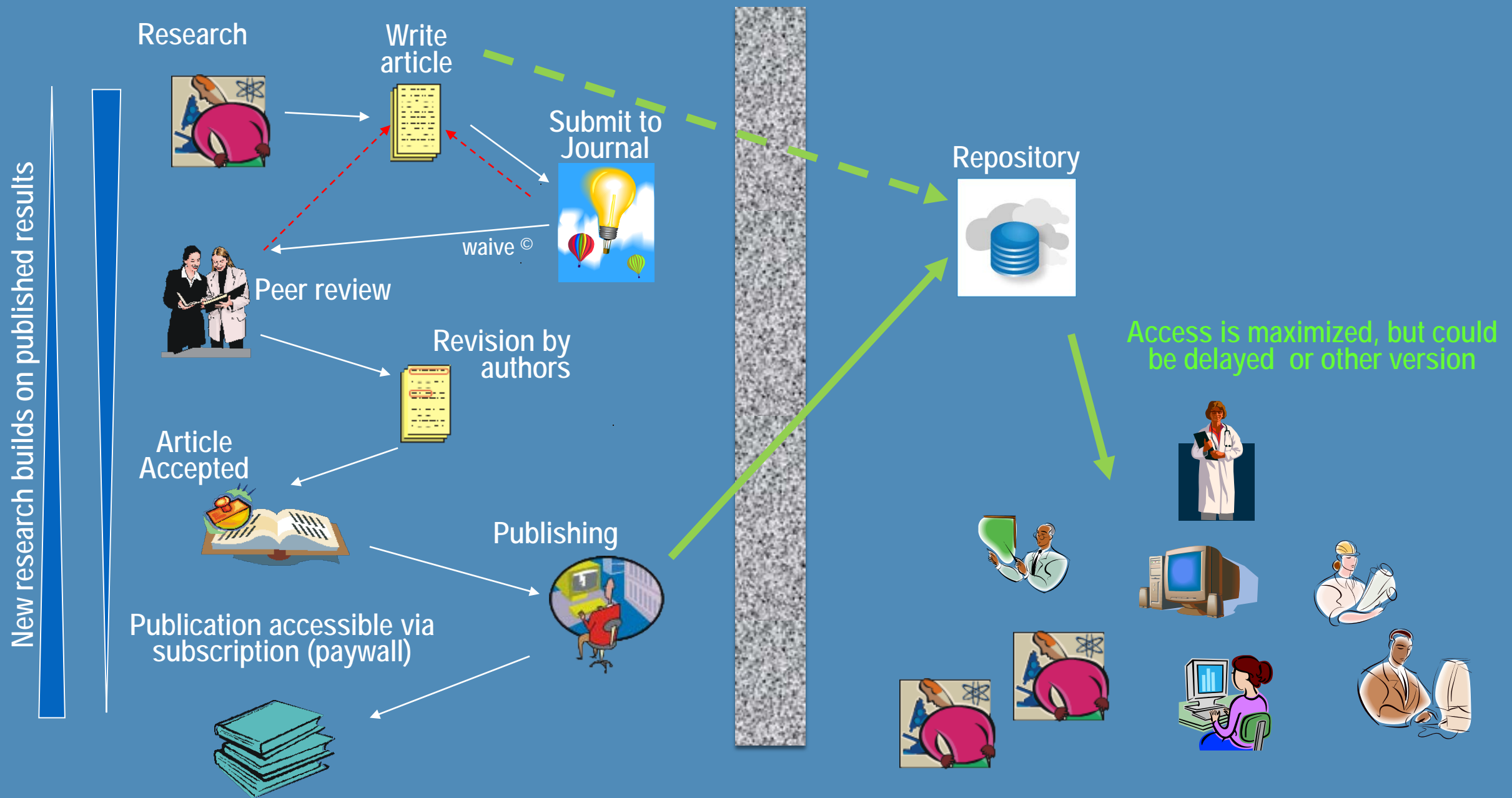
Scholarly Publishing Process – Gold/Hybrid/···

New research builds on published results

Research

Write article

Submit to Journal

Peer review

Revision by authors

Article Accepted

e.g. Pay Article Processing Charges, Funded by Societies

Publishing

retain ©
Publish CC-BY

Publication accessible

64

Scholarly Publishing Process – Open Research

New research builds on published results

Lab results

Data sharing

Research

Write article

Submit to OPEN RESEARCH

Pay Limited APC

waive ©

Open Peer review

< 1 Week

Revision by authors

retain ©
Publish CC-BY

< 1 Month

QA by Open Peer Review

Research Outputs Available

Sharing knowledge as fast and broad as possible

Scholarly Publishing Process
Research (Repository) Centred

New research builds on published results

Sharing knowledge as fast and broad as possible

Research

Submit to Subscription Journal

Preprint & Embargoed Article

Intermetiate Results

Trusted Repository

Submit to OPEN ACCESS Journal

Lab results

Write article

Data sharing

Submit to OPEN RESEARCH
< 1 Week

retain ©
Publish CC-BY

Preprint
(not reviewed)

66

Ron Dekker
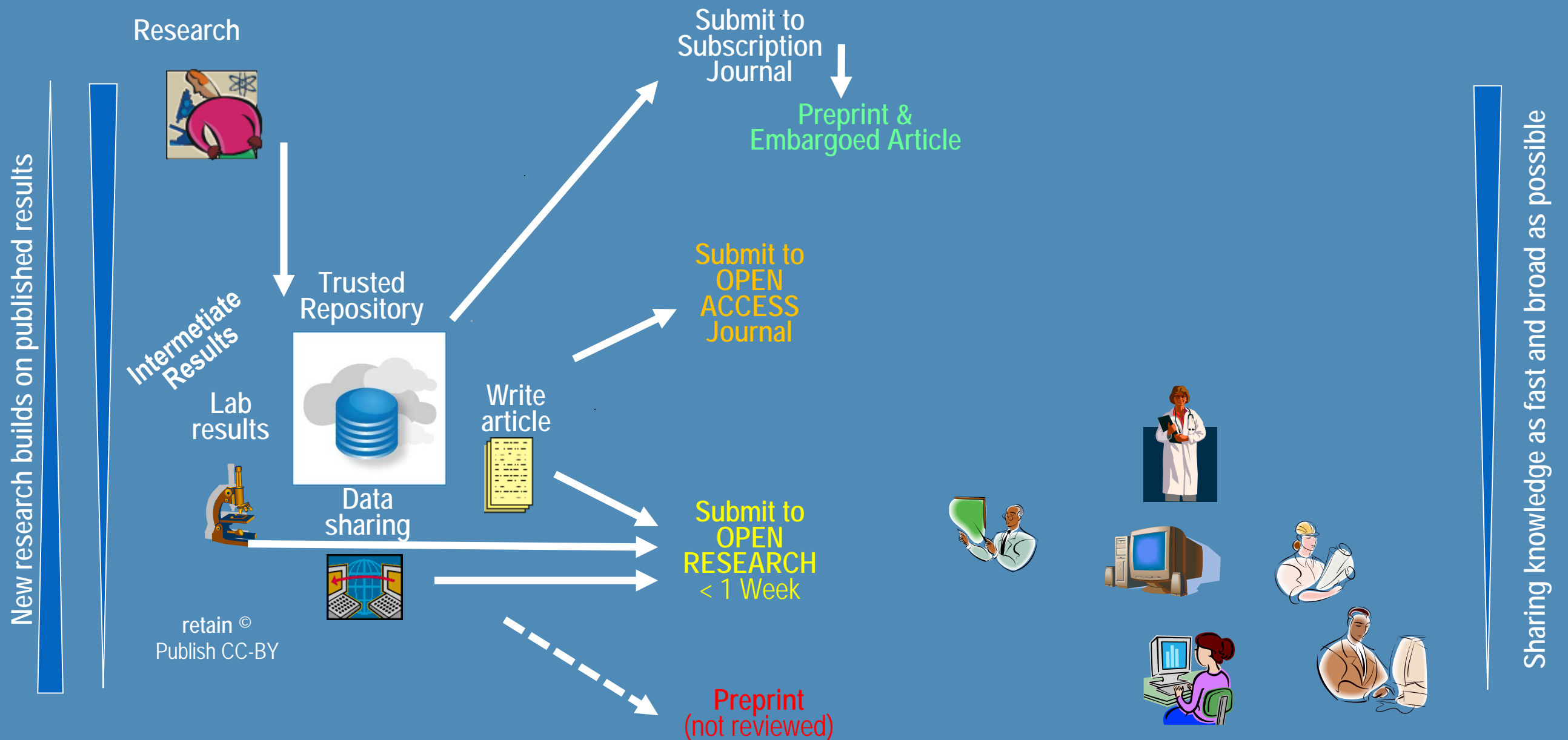
Wellcome Open Research

- Fast way to publish (< 1 week)
  - No obligation
  - Real article (not a preprint)
- Open peer review (< 1 month)
  - If positive → indexed in PMC
  - Metrics apply and available
  - Authors can submit new version
- FAIR pricing: $ 750 – eligible from grant
- Easy way to be OA compliant
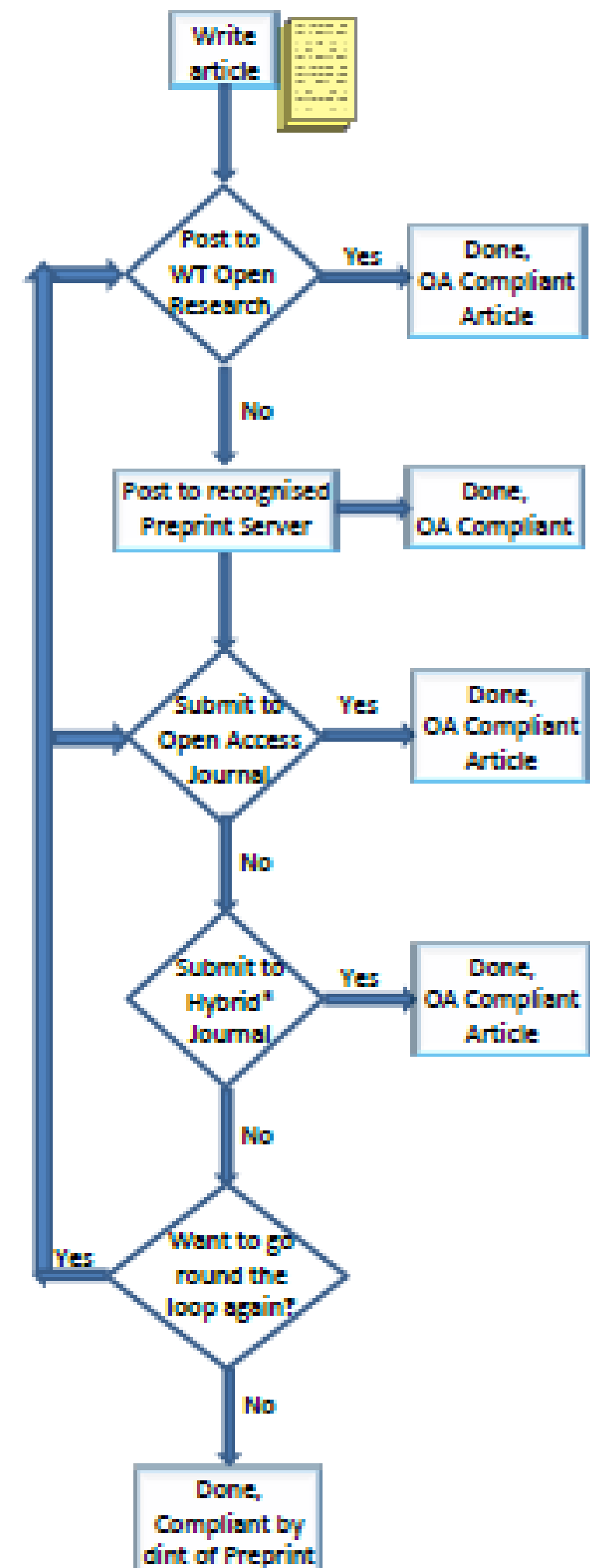
Preprints

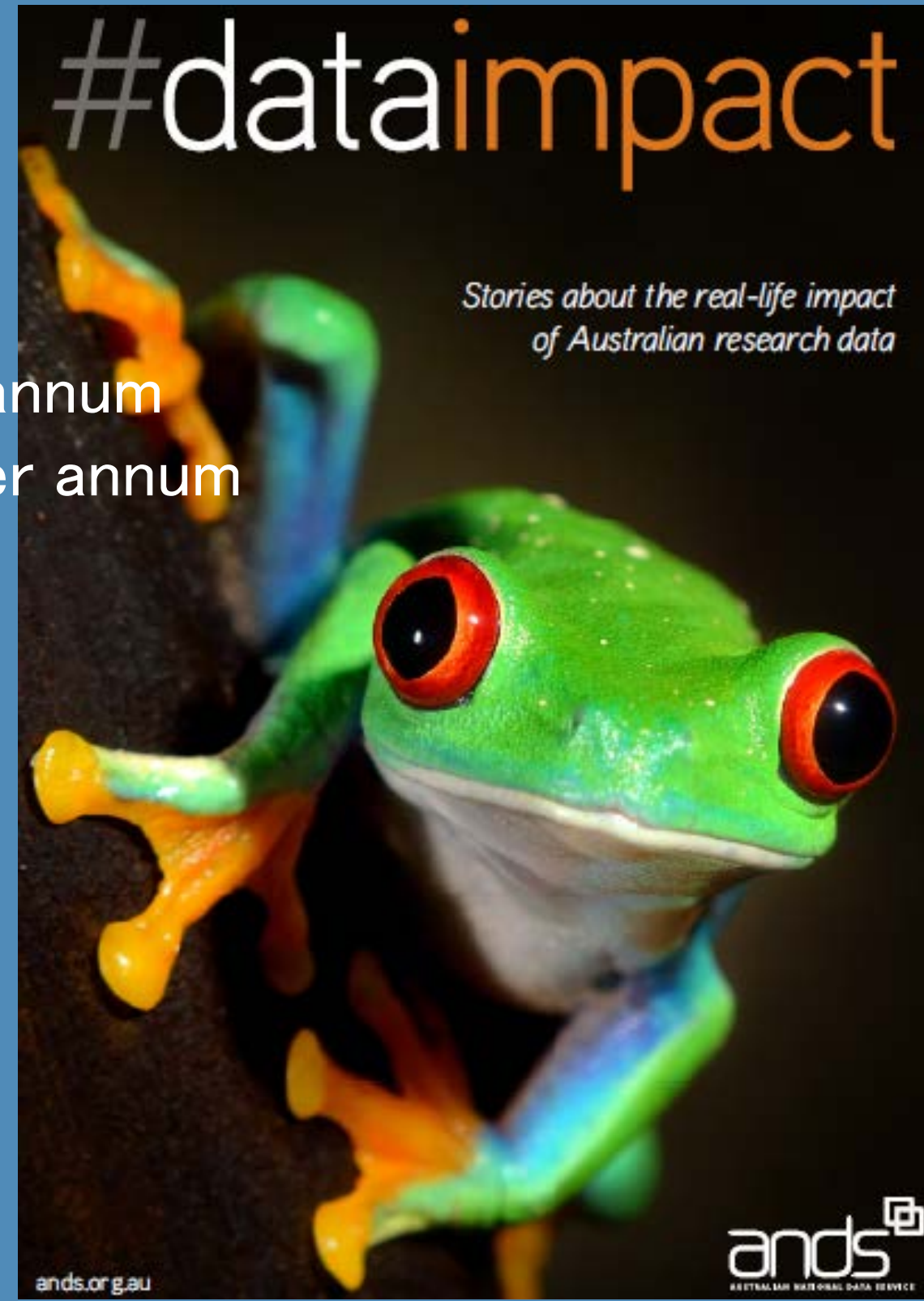*Preprints are complete and public drafts of scientific documents, yet to be certified by peer review*

- Funders acknowledge preprints as research output
  - Eligible in grant proposals and as project results
  - Can be article, lab result, data set, ···
- Faster way
  - to disseminate work, establish priority of discoveries, acknowledge funders' contributions to research advancement, and obtain feedback.
- Use trusted/recognized repositories as a base for output
- Connect the repositories and establish a Central Service
  - easy searching and finding outputs, and
  - facilitate processing and administering research results

68

Data Impact

EMBL-EBI (Beagrie):
    data value = 20 times annual cost

ANDS (Houghton & Gruen, 2014):
    value = AUS$4.3 to $6.4 billion per annum
        up to AUS$8.9 to $13.3 billion per annum

But Who Gets The Revenues?

#dataimpact

Stories about the real-life impact
of Australian research data

ands.org.au

ands

Data Infrastructures

- By Nation for all Disciplines OR by Discipline over Nations

- Strategy for Platforms OR Pipelines (traditional)
  - HBR: Pipelines, Platforms, and the New Rules of Strategy

- Let 1000 Flours Bloom OR Central Planning Approach
  - Principles? e.g. Subsidiarity
  - Structural Genomics Consortium (www.thesgc.org)
    - win-win for companies and researchers

The Value and Impact of the European Bioinformatics Institute

Full Report January 2016

Analysis and report by:
Neil Beagrie, Charles Beagrie Ltd., Salisbury, United Kingdom
John Houghton, Victoria University, Melbourne, Australia

Ron Dekker

Case: Structural Genomics Consortium

CREATIVE COMMONS

PROPRIETARY

Public–Private Partnership	Public Domain	Commercial

Tools & Basic Knowledge NOVEL Proteins only!

- Structure
- Chemistry
- Antibodies
- Screening
- Cell Assays

Discovery and Exploration

- No patent
- No restriction on use
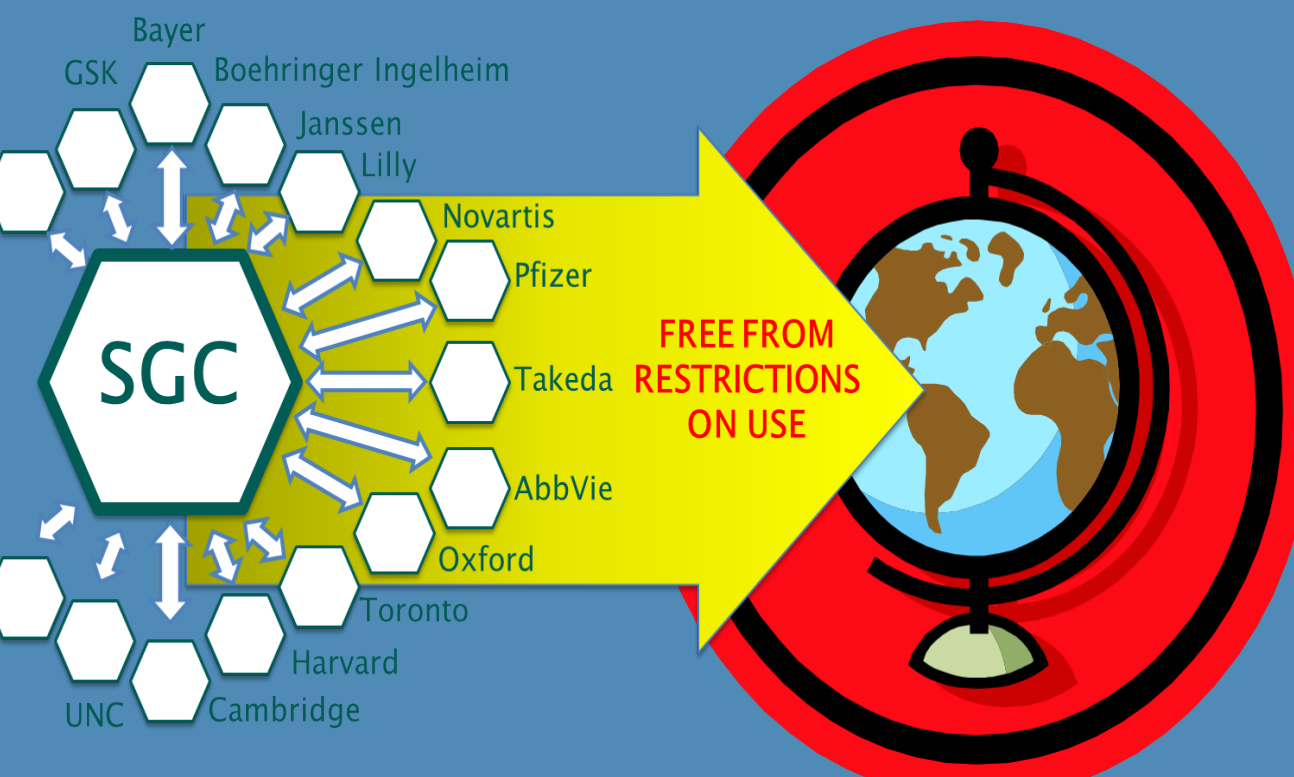- Open access to tools and data.
- Target identification & validation

Drug Discovery and Development

Facilitated by access to increased amount of information in the public domain

- (re)Screening
- Lead Optimisation
- Pharmacology
- Metabolism
- Pharmacokinetics
- Toxicology
- Chemical development
- Clinical development

Bayer
GSK
Boehringer Ingelheim
Janssen
Lilly
Novartis
Pfizer
Takeda
AbbVie
Oxford
Toronto
Harvard
UNC
Cambridge

SGC

FREE FROM RESTRICTIONS ON USE

A general model for open science in early stage drug discovery

Weigelt J. EMBO Reports 10:941–5 (2009)
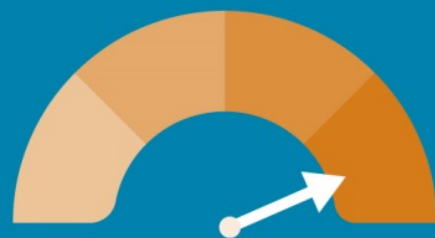
Personal Note

- How to cooperate   – in times of protectionism

- How to innovate   – facing increasing competition

- **How to share**   **– instead of own**

Ron Dekker

Personal Note

**IF YOU WANT TO GO FAST,
GO ALONE
IF YOU WANT TO GO FAR,
GO TOGETHER**

SPARC Japan

Articles and Data Distribution in the Trend "Open Science"
–

Future Standard Infrastructure Supporting Creation of Scientific Knowledge:
1. Roads to Open Access for Japan
2. Promoting Openness of Research Data: Incentive and Data Management
3. **Reconsidering Open Science**

3rd SPARC Japan Seminar, Feb 2017