

Transition to Open Science

Towards an Improved Practice of Science

Frank Miedema

Vice Rector Research, Utrecht University

Chair UU Open Science Program

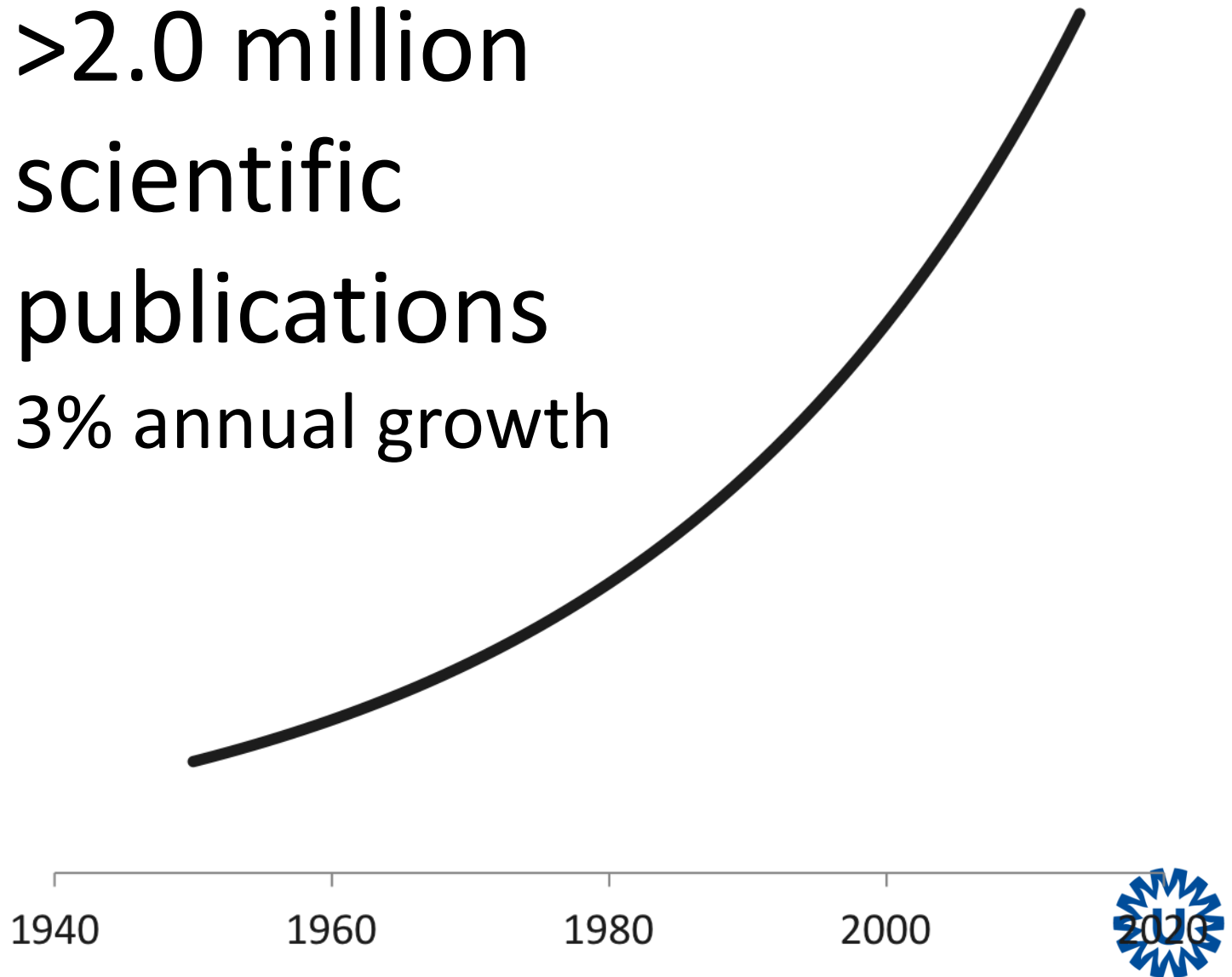
Twitter @MiedemaF; www.scienceintransition.nl



Universiteit Utrecht



Today, annually \approx
>2.0 million
scientific
publications
3% annual growth



Just some of the problems of the science system

- Replication crisis
- Competitive and non-cooperative practices
- Massification, competition, embargos, positivity bias → unproductivity
- Monopolized and expensive publication markets
- Privatization of infrastructures and problems of knowledge ownership / knowledge access
- Non-recognition of importance of knowledge commons outside of specialist communities
- Brain Drain and publish or perish...



The Scientific Field: Professional Interests, Elites, Stratification, Power Struggle, and Economics

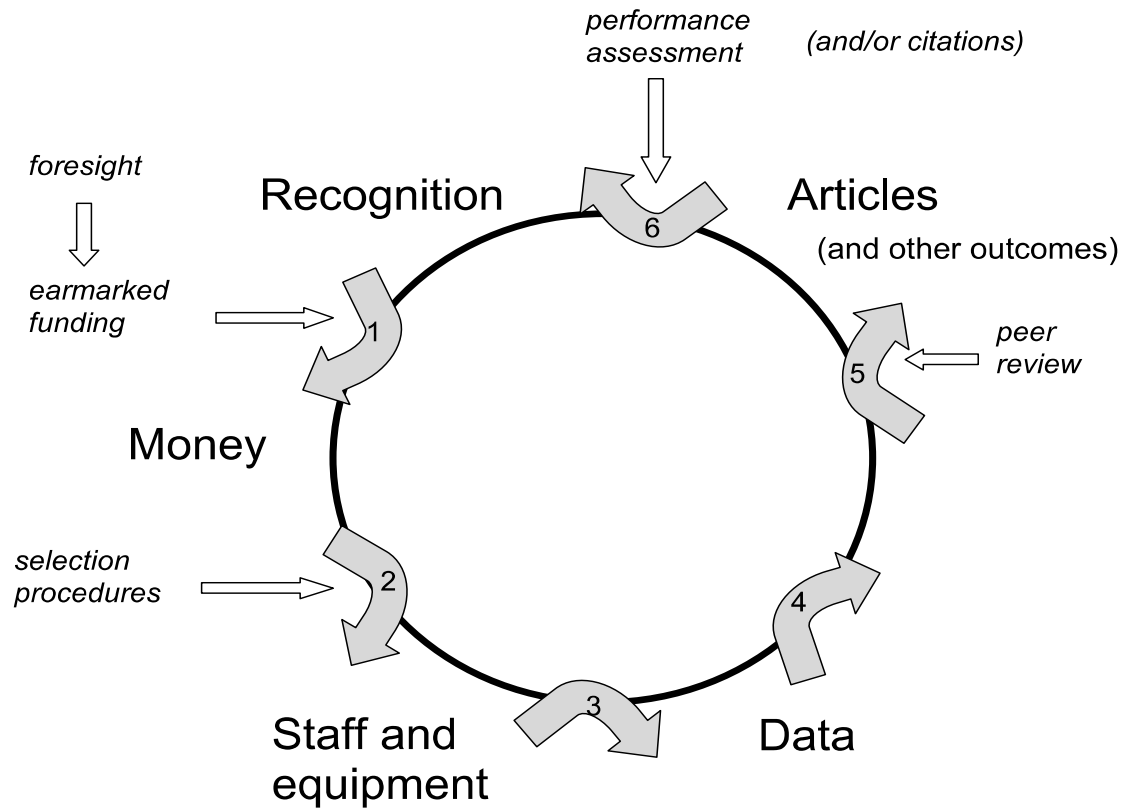


Figure 3. The credibility cycle, adapted from Latour and Woolgar (1986). Points at which organizational devices connect to the cycle are shown

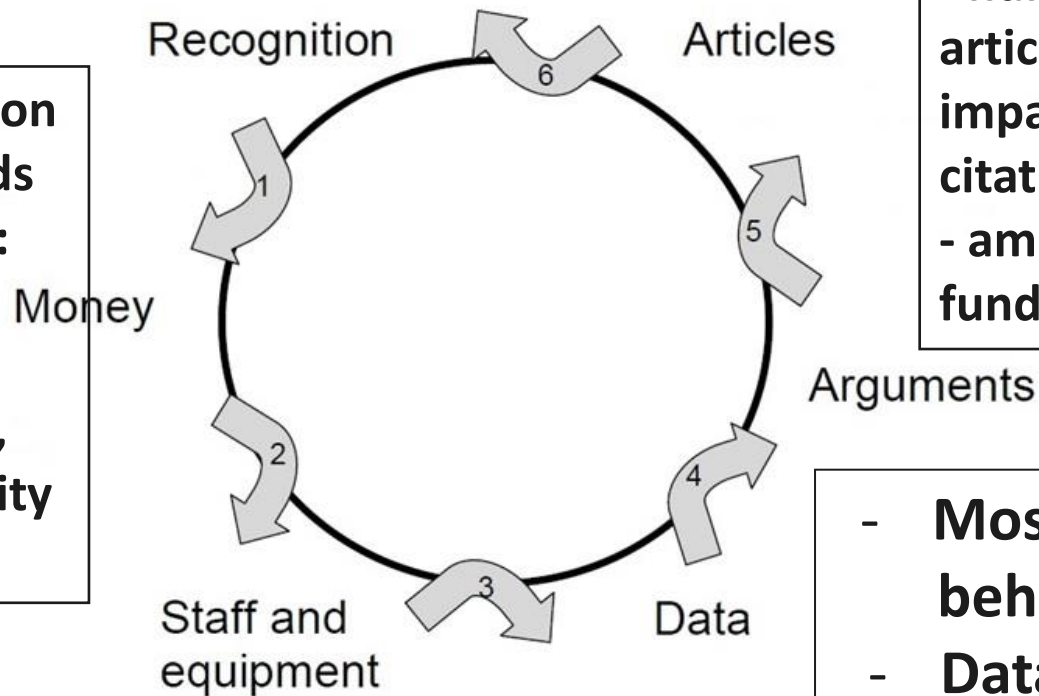


Problems of the Current Reward System in Science

Society is largely absent from the *credibility cycle*

Hypercompetition
for limited funds
works against:

Team-Science,
Multidisciplinarity
& Diversity



Quality in
Quantitative terms:

- number of articles, journal impact factor, citations, H-index
- amount of funding obtained

- Most papers still behind paywalls
- Data not shared



Metrics Shapes Science 1

- Quality, replication, relevance and impact are subordinate to *novelty and quantity*
- Short-termism and risk aversion because of 4-year cycles
- Universities outsource talent management to funders based on flawed metrics instead of having a research strategy going with their mission



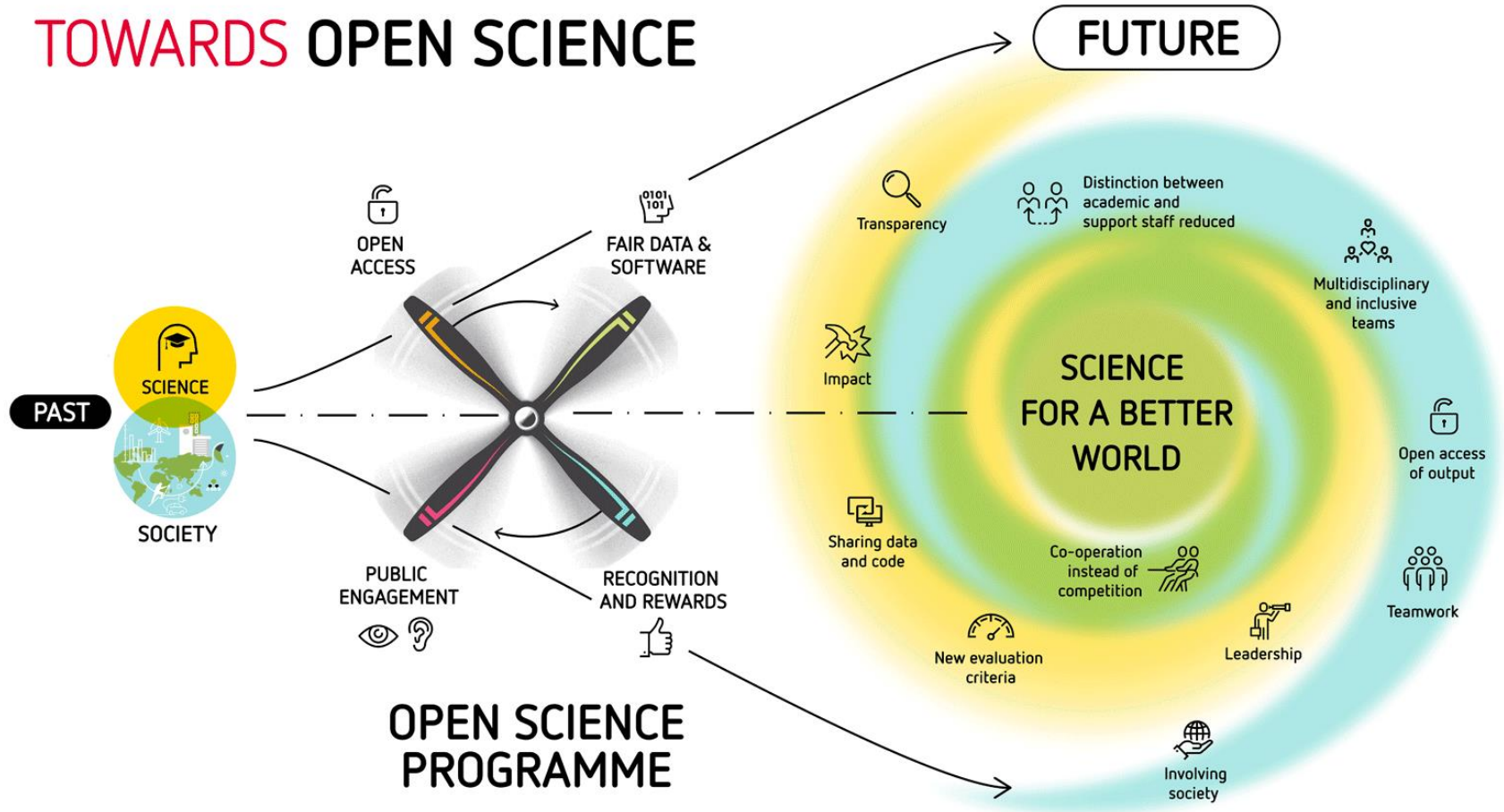
Metrics Shapes Science 2

- Fields with high societal impact, but low impact in the metrics system suffer (applied << basic; SSH << STEM)
- The national and institutional research agenda is not properly reflecting societal (clinical) needs and disease burden
- Open Science (responsible) research practices, stakeholder engagement, preregistration, FAIR DATA and Open Access are just 'nice to have'





TOWARDS OPEN SCIENCE





Open access

The goal of the open access project is to make substantial progress in order to make open access a natural part of the academic workflow.



FAIR data and software

Making relevant data fully FAIR (Findable, Accessible, Interoperable and Reusable) and also open wherever viable has many advantages.



Public engagement

Increasing public engagement helps to make science and scholarship relate more closely to societal issues and any questions that people might have.



Recognition and rewards

The available system of recognition and rewards is seen as the most important in effecting the change towards open science.

Open Science: Open Production and Use of Knowledge

The overall aim of Open Science is to increase the quality, progress and scientific and societal impact of research and scholarship.

To achieve these goals in the practice of Open Science

- Engage -when appropriate- with relevant and representative stakeholders from society to:
- Define problems to be investigated; discuss ongoing research
- Actively promote that the results of any kind provide guidance for implementation and action(s) in the specific contexts.



Open Science: Open Production and Use of Knowledge

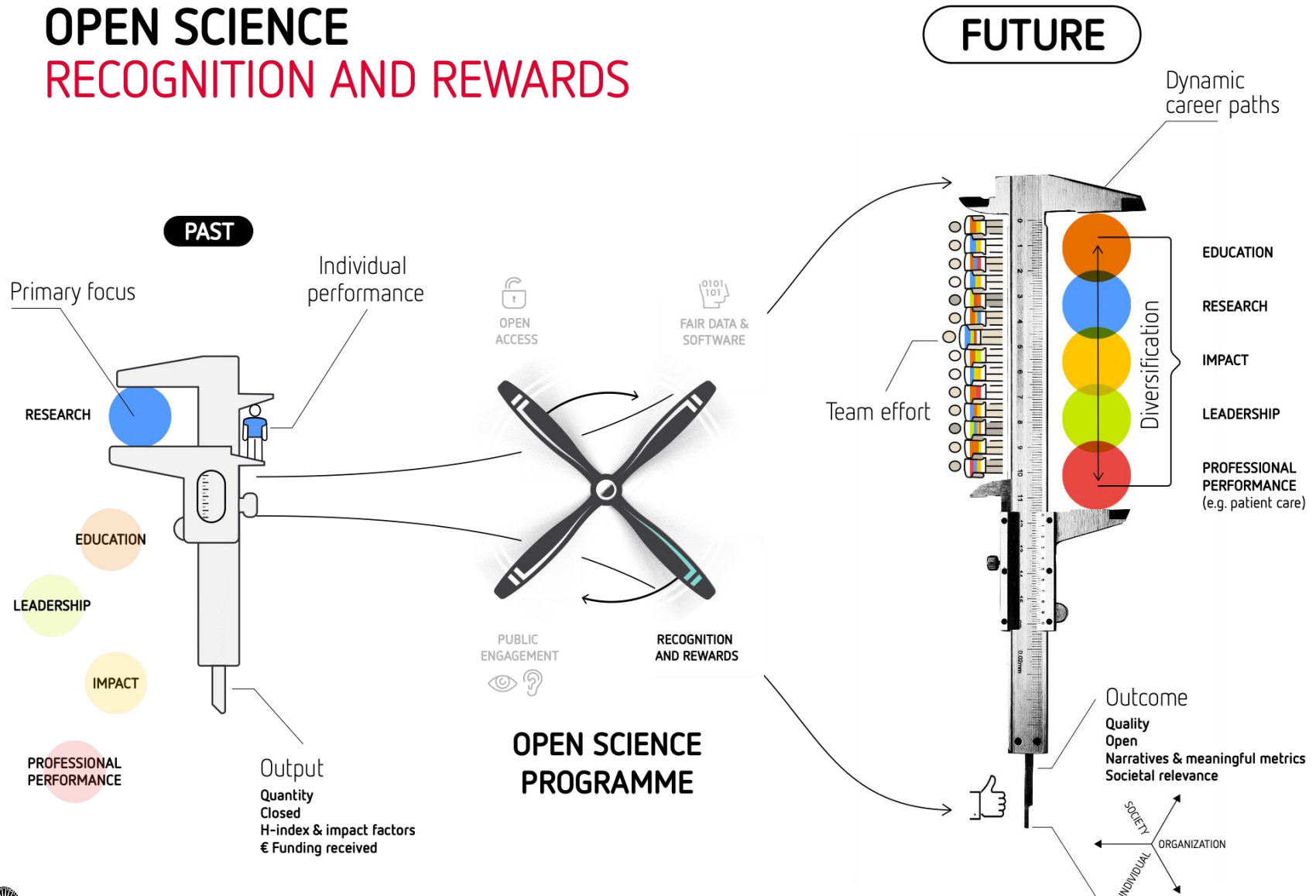
The overall aim of Open Science is to increase the quality, progress and scientific and societal impact of research and scholarship.

To achieve these goals in the practice of Open Science

- Share research results, if possible, in several stages of the work and publishing these papers Open Access
- And if possible Data and Code (Software) Open Access



OPEN SCIENCE RECOGNITION AND REWARDS



@UMCUTRECHT: Inclusive set of generic indicators for research quality and impact (in use since 2016)

Structure	Leadership & culture
	Collaborations with stakeholders
	Continuity and infrastructure
Process	Setting research priorities
	Posing the right questions
	Incorporation of next steps
	Design, conduct, analysis
	Regulation and management (OA, FAIR data sharing)
Outcomes	Research products for peers
	Research products for societal groups
	Use of research products by peers
	Use of research products by societal groups
	Marks of recognition from peers
	Marks of recognition from societal groups

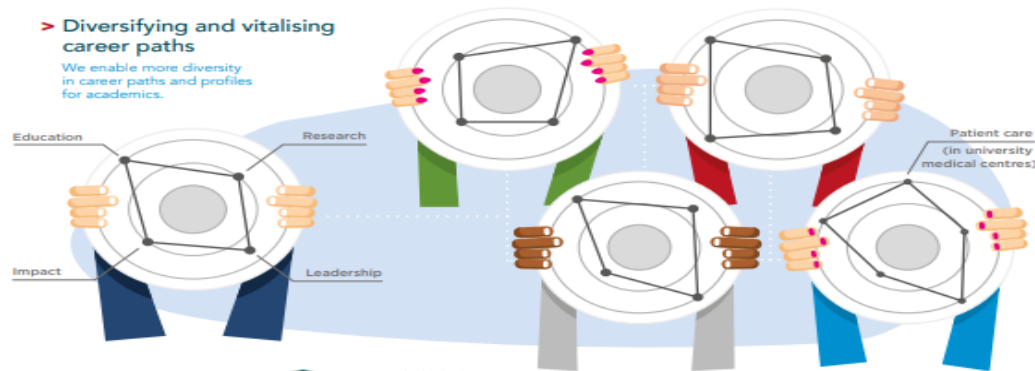


Room for everyone's talent

towards a new balance in the recognition and rewards of academics

> Diversifying and vitalising career paths

We enable more diversity in career paths and profiles for academics.



> Achieving balance between individuals and the collective

We assess academics based on both their individual and their team performance.



> Focusing on quality

In our assessments of academic performance, we increasingly focus on quality, content and creativity.

> Stimulating open science

We encourage academics to share their research outcomes with society.



> Stimulating academic leadership

We stimulate good academic leadership at all levels.



Open Science: Incentives and Rewards

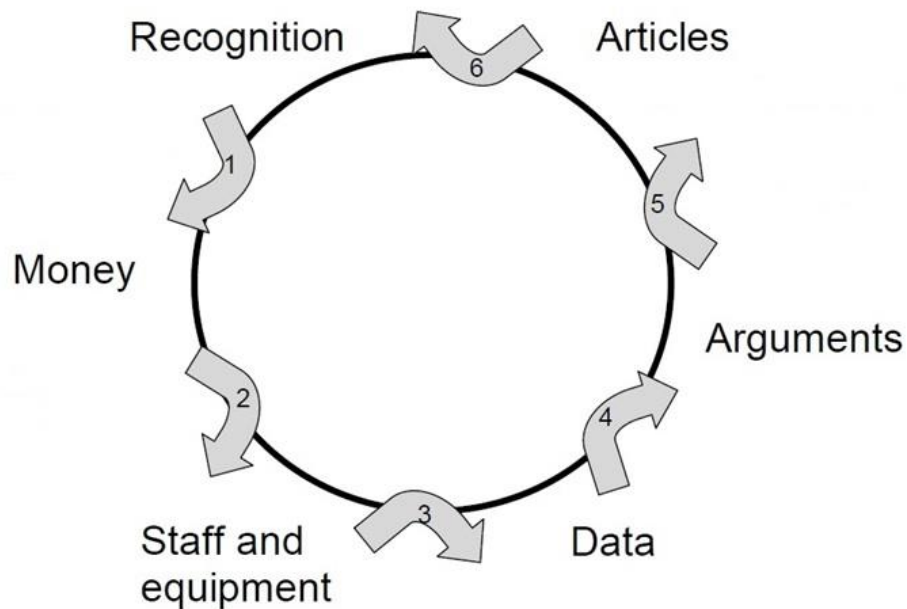
Pluriformity of quality indicators:

- SSH vs STEM balance
- Basic vs Applied science
- Diversity and inclusiveness
- Peer review, narratives are transparent (but could also be more subjective?)
- Open Science practices and efforts rewarded



Open Science: To improve quality and integrity at the personal level by systemic change

**Engagement of societal
stakeholders in problem choice**



Inclusive indicators

Quality
Societal Impact
**Use in and outside
academia**
Process Indicators

OPEN PEER REVIEW
POST PUB PEER REVIEW

OA publishing
FAIR data sharing



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National Strategic Evaluation Protocol The Netherlands 2021-2027

The research unit:

- Vision, strategy and aims of the research are outlined
- Narratives (supported by data)*
- Free choice of indicators

*Compatible with DORA

https://www.vsnu.nl/files/documenten/Domeinen/Onderzoek/SEP_2021-2027.pdf



National Strategic Evaluation Protocol SEP The Netherlands 2021-2027

Evaluation in relation to the unit's strategy

Three criteria:

Research Quality, Societal Impact and Viability

Four Aspects:

- **Open Science practices and efforts**
- **PhD policy and Training**
- **Academic Culture (Openness, Safety, Inclusiveness, Research Integrity)**
- **Human Resources Policy (Diversity, Talent Management)**



The many Initiatives and Actions to Improve the Impact of Science

- <https://sfdora.org> The San Francisco Declaration on Research Assessment
- <https://scienceintransition.nl>
- **2016 EU adopts Open Science as the standard for Horizon Europe 2021**
- <http://ec.europa.eu/research/openscience/index.cfm?pg=open-science-policy-platform> Including Open Science Career Advancement Matrix
- <http://rewardalliance.net> sequel to the Lancet series;
<https://metrics.stanford.edu>
- <http://www.leidenmanifesto.org>
- <http://responsiblemetrics.org>
- Dutch Natl Platform Open Science 2017
- www.uu.nl/openscience
- VSNU, NWO, NFU: www.vsnul.nl/Room for Everyone's Talent
- **Coalition S and Plan S**
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