

European Pathways to Open Science 25 Oktober 2016

Open Science

Von der Vision zur Praxis

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Responsible Research and Innovation in Academic Practice

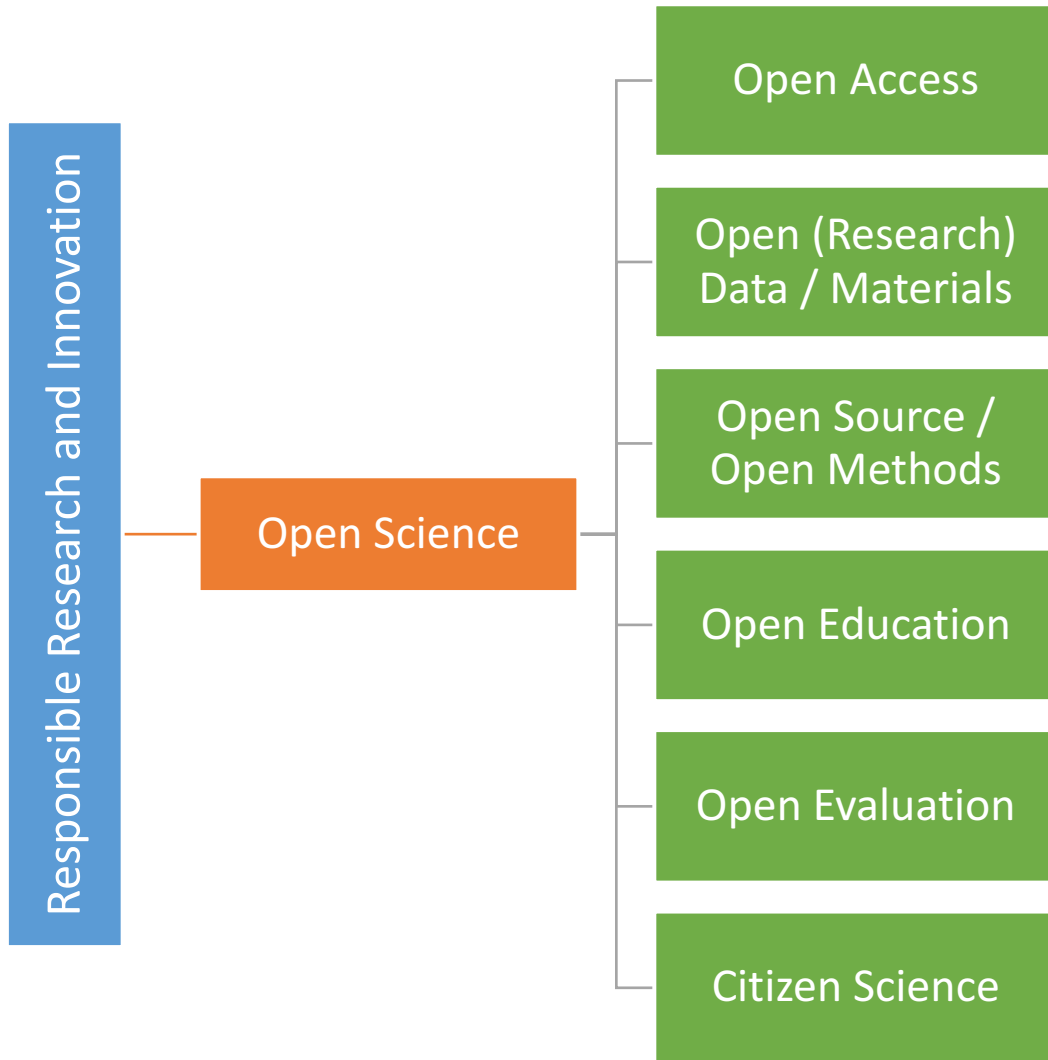
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Wissenschaft als öffentliches Gut

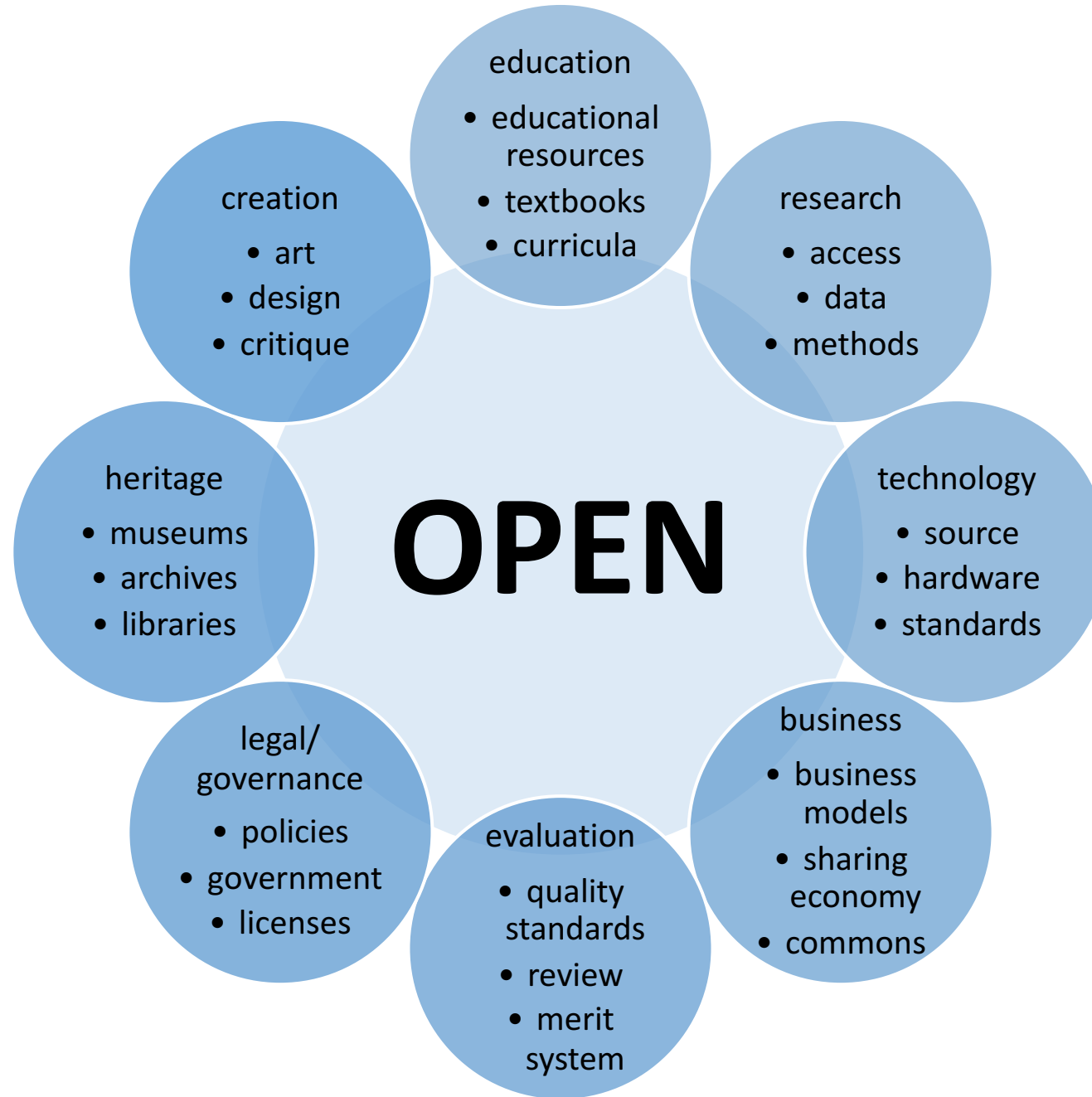
science commons



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

Open strategies in science share the following objectives

- sharing and collaboration
- transparency and reproducibility
- re-usability and new applications
- societal participation and feedback loops



The 3 Os of EU Science Policy

Jobs and growth



Priorities of Commissioner Moedas

- Open Innovation
- Open Science
- Open to the world



Science, Research and Innovation performance of the EU

areas such as nanosciences and nanotechnology, ICT, materials or biotechnology. In addition, both China and South Korea have been increasing their number of highly cited publications in strategic fields at a higher speed than the EU and the US. A similar pattern applies for technological outputs.

There is evidence throughout the Report that continued policy attention to research and innovation and structural reforms ultimately pay off. The continued policy attention to reform the public research base and stimulate excellence has led *the EU to diminish the gap with the US in terms of scientific quality* whilst staying clearly ahead of countries such as South Korea, Japan and China.

A picture that emerges throughout the Report is *the persistence of an innovation divide across the EU*, with the Member States having joined the EU since 2004 performing, on average, at lower levels. It should be noted, however, that the characteristics of this innovation divide appear to be gradually changing, with some of the newer Member States increasing their performance substantially. In terms of R&D intensity, for instance, Slovenia is now ranked 6th across the 28 Member States, and has surpassed Belgium and France, while both the Czech Republic and Estonia are approaching the EU average. The Report also shows the importance of the European Structural and Investment Funds in financing the research and innovation systems of the newer Member States, which will contribute to further close the innovation divide.

A shift towards more knowledge-intensive activities also benefits employment. The Report shows that *employment in science and technology has been particularly resilient during the crisis*. Whilst total employment in the EU decreased by 0.7% on average per year between 2008 and 2013, human resources in science and technology increased by 2.1% per year over the same period and the number of researchers by 2.5%.

For the public science base to be fully effective in terms of increasing innovation performance and delivering impact, it needs to be well connected to the business sector and knowledge has to circulate freely. Public-private collaboration is a key aspect in this, in particular in an environment in which open innovation is becoming increasingly important and more actors are involved in the innovation process. In this respect, the EU has made some progress over the past few years, *but its intensity of public-private collaboration still lags behind that of Japan, South Korea and, in particular, the US*. Further efforts are needed to stimulate such cooperation, and the nature of the economic fabric should be taken into account when determining the optimal policy mix.

Moreover, the mobility of human resources is also an important mechanism to foster knowledge circulation between the public and the private sector. Yet here as well, *the EU is still not fully benefiting from the embedded knowledge of researchers trained by universities* as the number of researchers employed by the business sector is significantly lower than in the US, Japan and South Korea.

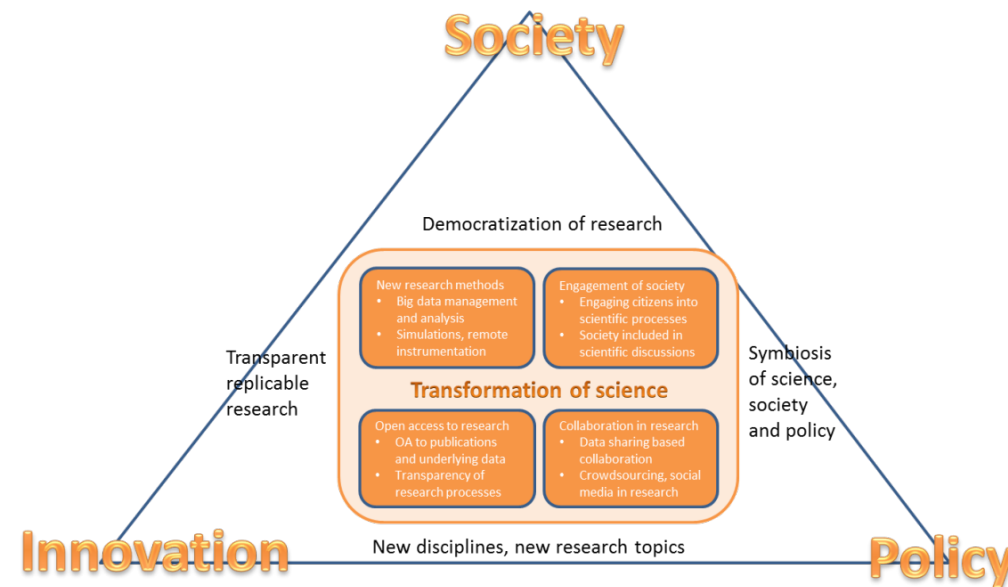
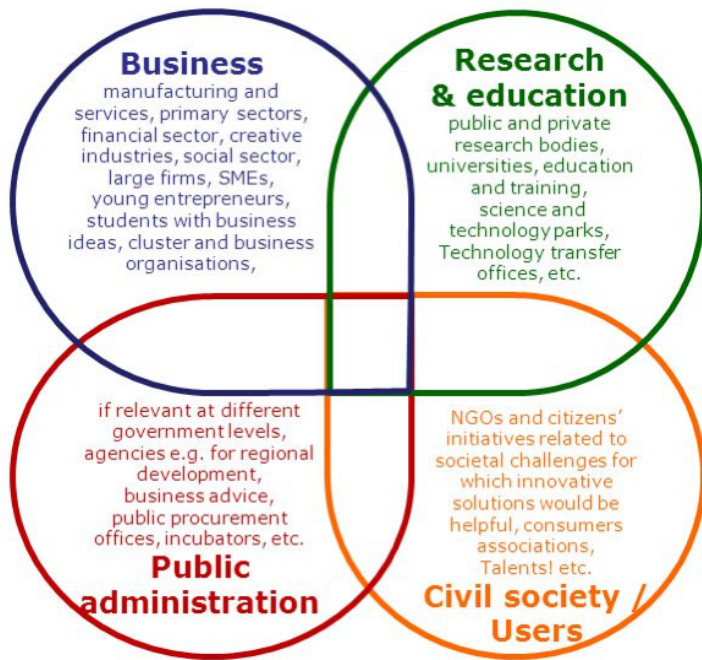
The EU needs to continue improving the quality of its science base and the intensity of knowledge circulation: Open Science

Excellent science is the foundation of future prosperity and openness is key to excellence. Despite a growing number of impressive developments at the frontier of science in Europe and an improving position of the EU worldwide, indicators of most excellent science show that the Europe is not top of the rankings in certain areas.

With more than 27% of the world total, *the EU continues to be the largest producer of scientific publications in the world*, ahead of China, which has overtaken the US. A significant evolution since 2000 is that the EU has overtaken the US as regards the total number of highly cited publications.

Politische Imaginationen von Open Science

Open Science aims at transforming science through ICT tools, networks and media, to make research more open, global, collaborative, creative and closer to society.





Spurring new solutions in complex areas like #eHealth, transport, environment



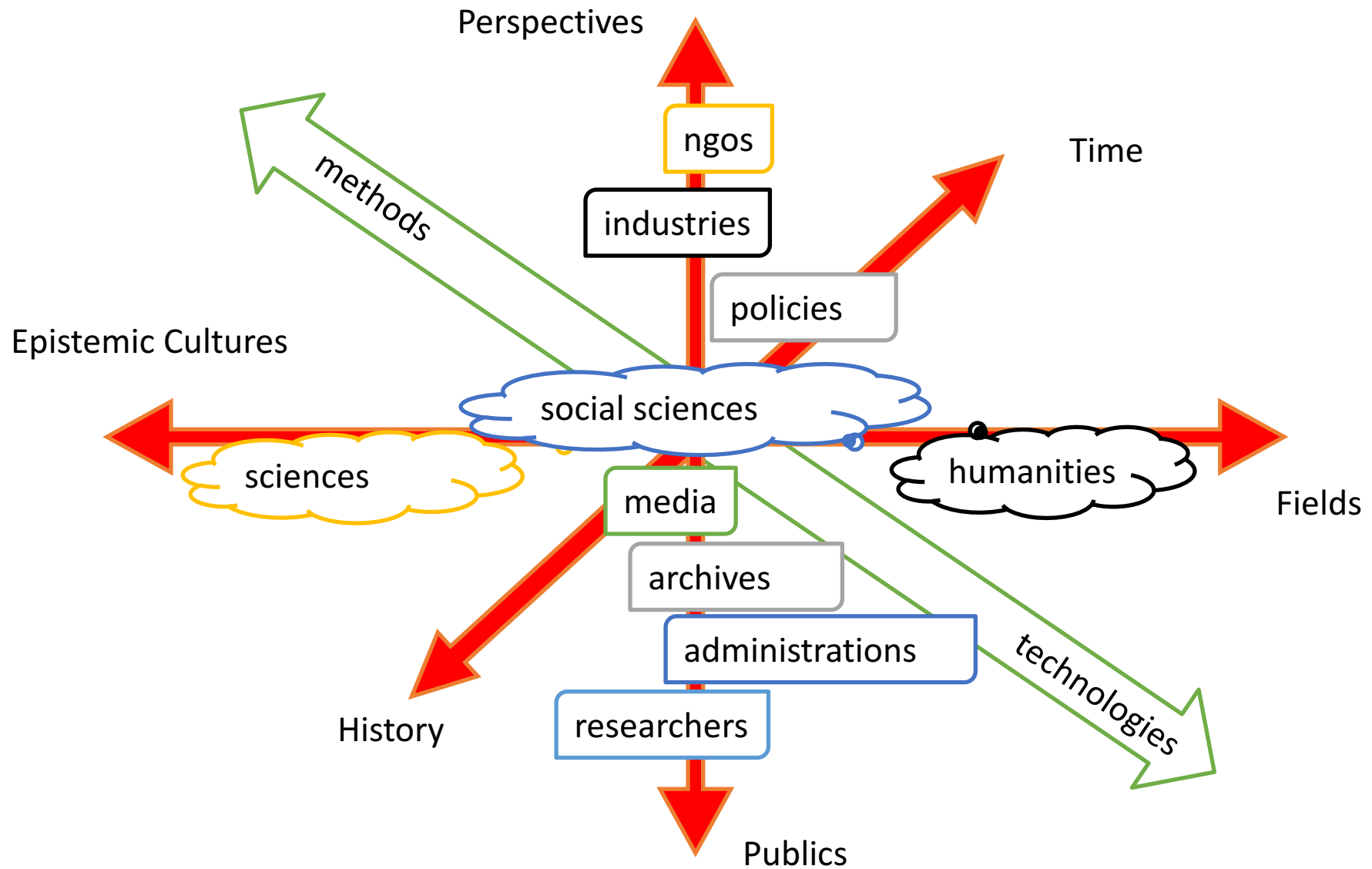
Better public services such as #smartcities



Better science for complex problems



Commercial opportunities for innovative companies





Expectations of Open Science

Science

accessibility

transparency and reproducibility (replication)

speeding up research

collaboration

visibility

training in field specific open science skills

science for social good

changes in the reward system

getting out of precarious working conditions

Policy

speeding up innovation (commercialisation and implementation, value creation)

accountability and citizen/user involvement (e.g. “knowledge coalitions”)

increasing technology acceptance

reusability

new technologies will bring more openness (mobile methods, data analytics, TDM,...) - openness will create more acceptance for new technologies

Realitäten der Open Science

Ja, Offenheit existiert in vielen Ausprägungen und Zeiträumen

Ja, Offenheit bringt Kritik und Meinungsverschiedenheit

Ja, Offenheit bringt Diversität und Komplexität

Ja, Offenheit ermöglicht Partizipation und Intersubjektivität

Ja, Offenheit kostet Geld und ist aufwändig

Ja, Offenheit erfordert besondere Fertigkeiten und Vertrauen

Ja, Offenheit kann man nicht völlig kontrollieren

Ja, Offenheit muss die Privatsphäre respektieren

EU Forschungspolitik: Wo stehen wir jetzt?



Mandatory OA policy in H2020

business model gold OA
traditional path
dependencies vs new
publishing models
(collective publishing
platforms...)
green OA repositories
OA institutional policies

“as open as possible, as closed as necessary”

Data management plans
Data repositories
Open science cloud
Mandatory from 2017
Legal frameworks pending
(copyright law, open data
law...)

OS actions

Based on OA and ORD
specific calls, not yet
mainstreamed
Training platforms and
raising awareness
Open science cloud
Citizen science
Open science policy
platform
Marginal open education

EU Agenda for research actors in 2020?

Reward

- The European research career evaluation system fully acknowledges Open Science activities

Research Integrity

- All publically funded research in the EU adheres to commonly agreed Open Science Standards of Research Integrity

Education and skills

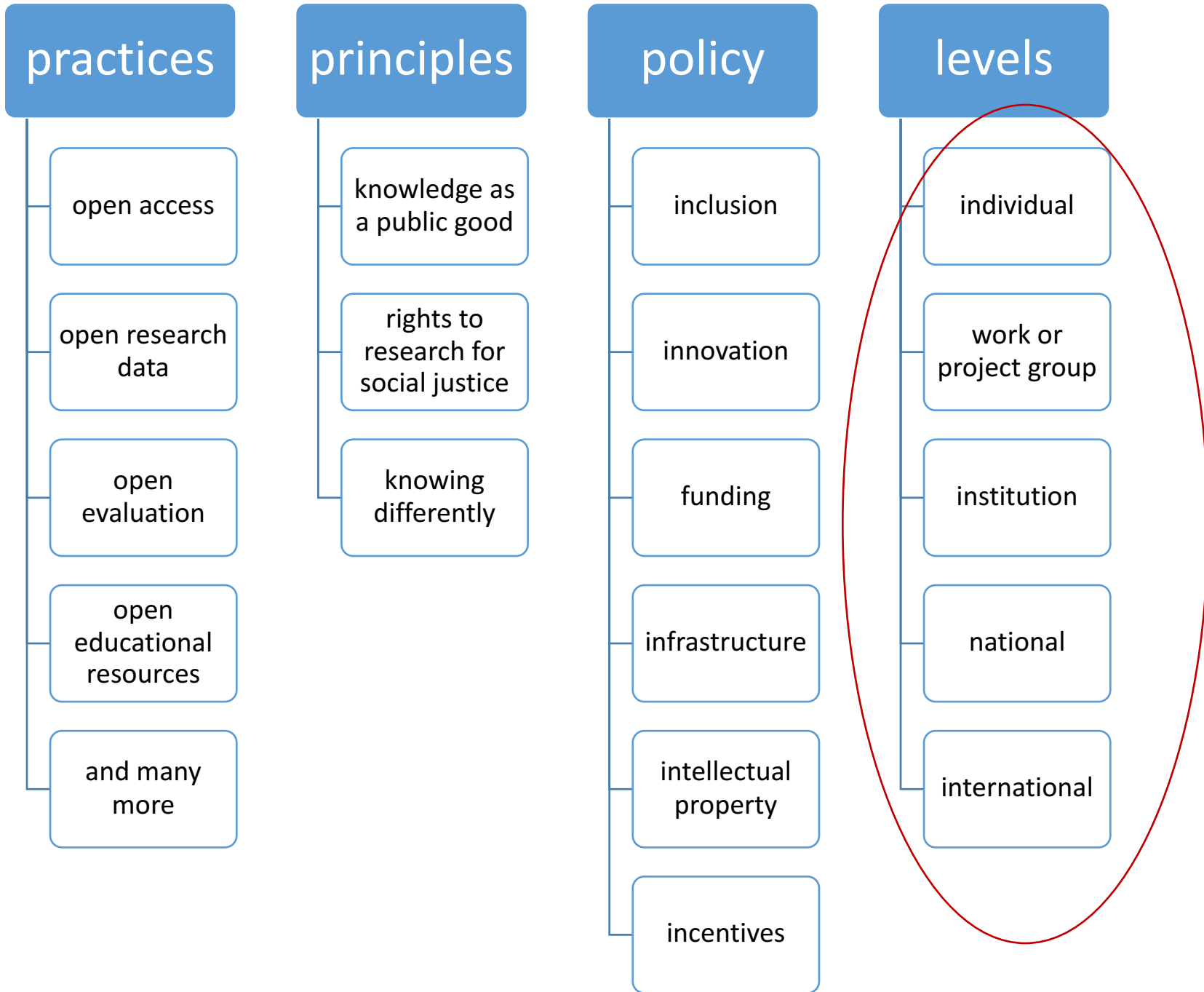
- All young scientists in Europe have the necessary skills and support to apply Open Science research routines and practices

Citizen Science

- Citizen scientists significantly contribute and are recognised as valid knowledge producers of European science



Policy Challenges



Prioritäten für eine nachhaltige Open Science Politik

Anreize schaffen

- Aufmerksamkeit generieren und Wertschätzung etablieren
- Top-down und bottom-up Ansätze verbinden

Zeit und Raum für Training und Experimente

- Lehre, Forschung, Innovation zusammendenken
- Transdisziplinäre Kollaboration stärken

Mainstreaming Open Access

- OA im Forschungssystem verankern
- Link Administration und Forschung stärken

Koordination nationaler und europ. Strategien

- Open Science durch alle Strategien stärken (Digitales Österreich, ERA; Open Innovation, ...)
- Stakeholder zusammenbringen

Offene Infrastrukturen für offene Daten

- Klare Anforderungen und Roadmaps
- Interoperabilität fördern

Legale Sicherheit

- Kollaborative Forschung für offene Lizenzen und Policies sensibilisieren, Rahmen bieten

Vienna PRINCIPLES



a vision for scholarly communication

- | | | |
|-------------------|---------------------|-----------------------|
| 1 Accessibility | 5 Transparency | 9 Evaluation |
| 2 Discoverability | 6 Understandability | 10 Validated Progress |
| 3 Reusability | 7 Collaboration | 11 Innovation |
| 4 Reproducibility | 8 Quality Assurance | 12 Public Good |

Danke für die Aufmerksamkeit!

<http://viennaprinciples.org> - Vienna Principles

<http://oana.at> - Open Access Netzwerk Österreich

<https://era.gv.at/object/document/2279> - Open Science Policy Briefing

<http://okfn.at/themen/open-science/> - Open Knowledge Arbeitsgruppe

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