

# *Open Science: From Theory to Practice [10 years later]. Policies and Mandates at the EU level*



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**uc3m**

 **OpenScienceLab**





- **Open Science... 10 years later**

- Context (RRI, HRS4R, HEurope, UNESCO Recommendation)
- ERA (European Research Area)

- **Challenges... Cultural Change**

- Rewards and incentives & motivators of will

- **Implementation mode... @universities**

- Open Science... HOW?
- PCIs: Practical Commitments for Implementation
- Example at the institutional level (Alliances)

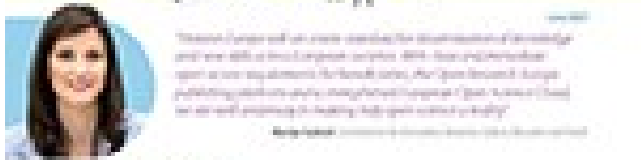
*"We all agree that we need to change the way we measure Science, why we don't do it?"*

Amsterdam Call for Action  
on Open Science

EU  
2016



Introduction video Conference Open Science 4- 5 April **2016**, Dutch  
Presidency EU2016: <https://www.youtube.com/watch?v=C9a3Ap3yyak>

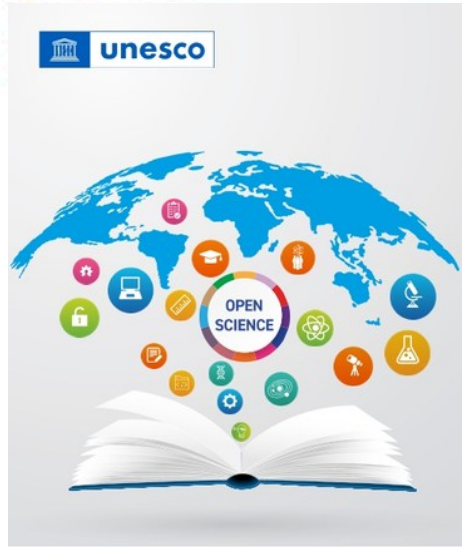
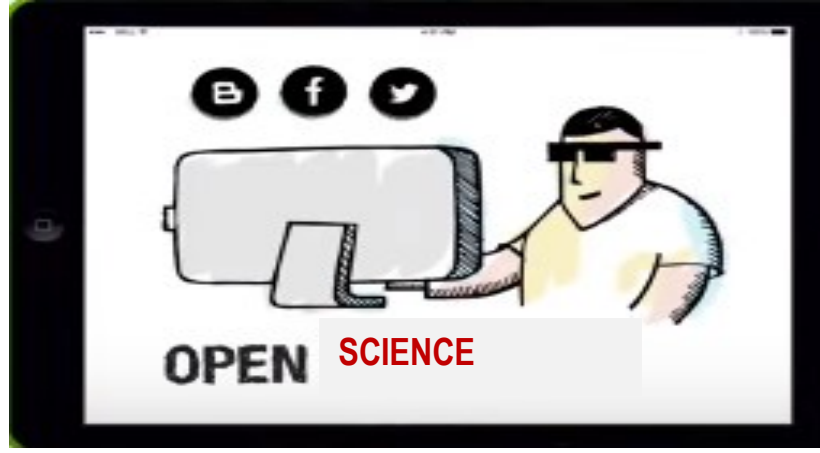
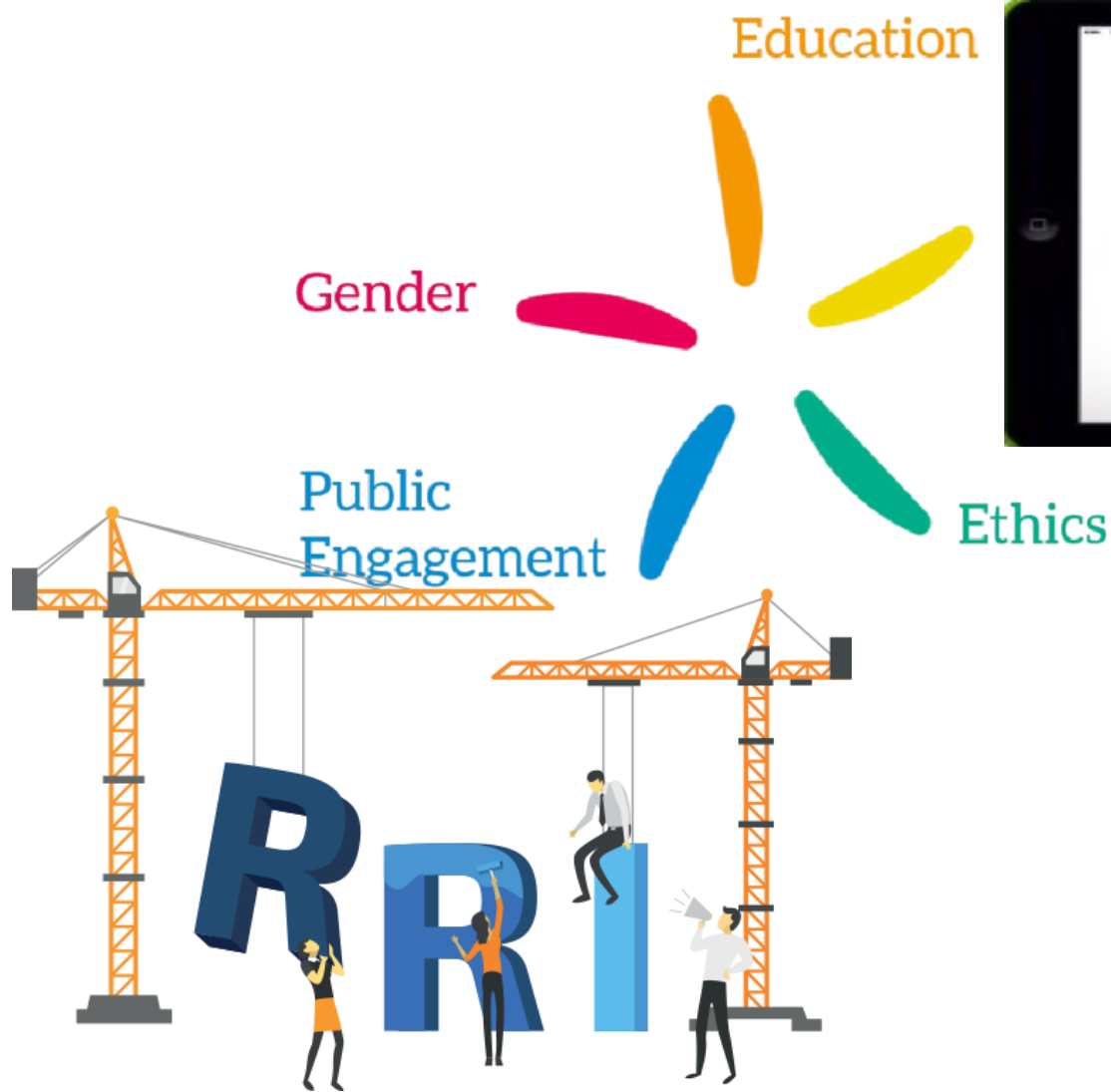


**OPEN SCIENCE**  
 EARLY KNOWLEDGE AND DATA SHARING, AND OPEN COLLABORATION

The challenge is for Europe to address open science on the widest possible scale for all researchers. Open science consists of the sharing of knowledge, data and tools as early as possible in the research and innovation (R&I) process, in collaboration with all relevant stakeholders in R&I, including academic, industry, public authorities and policy makers, and covering all types of R&I activities for the potential to increase the quality, efficiency and impact of R&I. Good to practice implementation is needed. Challenges and critical issues of R&I. Good to practice implementation is needed.

**What are open science practices?**

- Researcher to research output: all activities that address visibility, openness and quality
- Data and knowledge sharing: all activities that support transparency, openness, quality and impact and maximization of visibility in a specific practice
- Use of open science infrastructure for enabling activities sharing



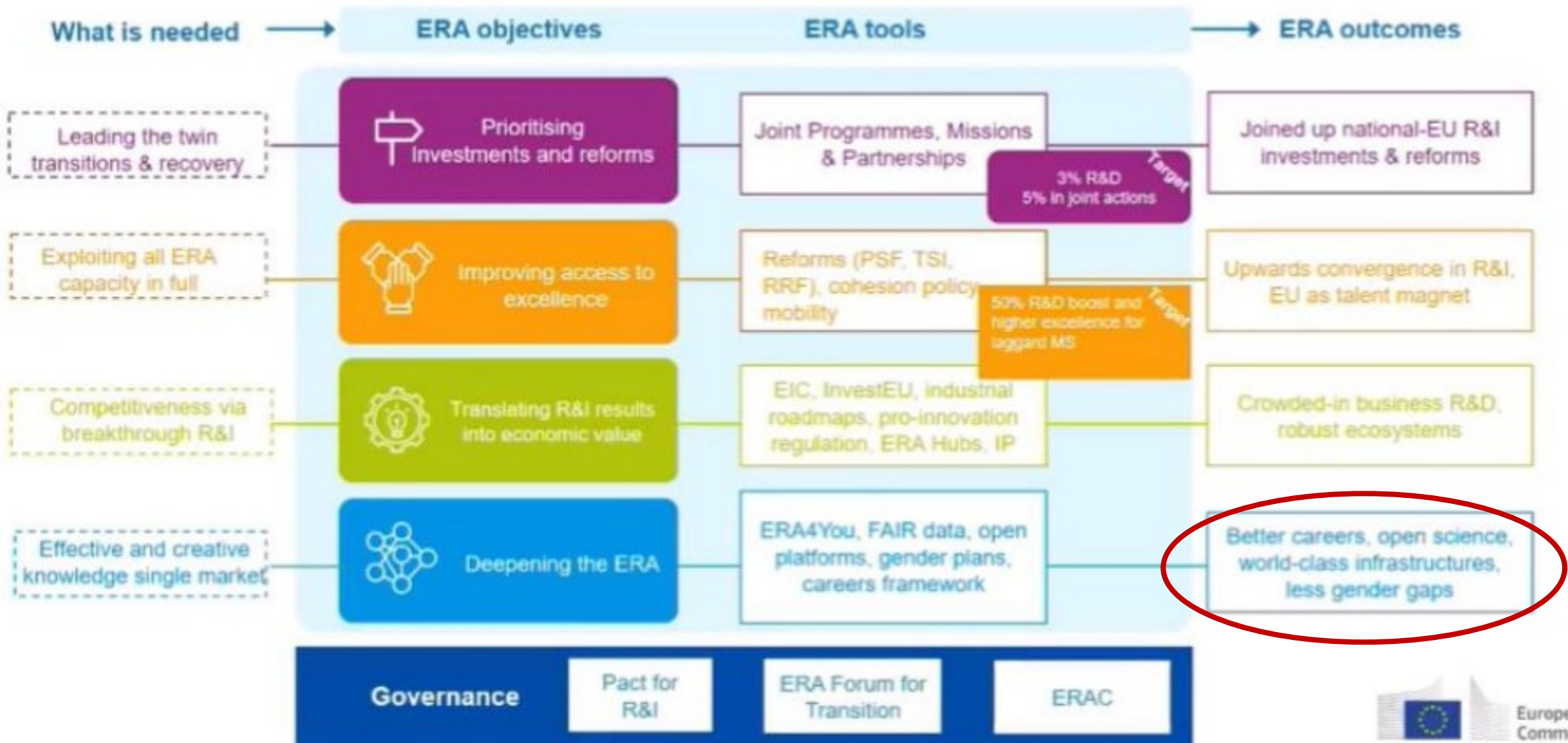
UNESCO Recommendation on Open Science



... Where *openness, transparency and equity*... are an integral component of the research and innovation process



# European Research Area



15/02/2017



Open Access  
 Open Data (LOD)  
 Open Research Data  
 Open Software (FLOSS)  
 TDM  
 Open Design

STANDARDS GOVERNANCE

Open Research  
 Open Scientific workflows  
 Open Methodologies  
 Open Peer Review  
 Collaborative Science

#RRI

#RRI



<http://tinyurl.com/scholcomm-charters>

+ 130 DECLARATIONS, RECOMMENDATIONS, ETC.

Charters and principles in scholarly communication

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1	Friendly URL: <a href="http://tinyurl.com/scholcomm-charters">http://tinyurl.com/scholcomm-charters</a>	
2		
3	<a href="#">Journal of Brief Ideas paper proposal</a>	
4	<a href="#">Force11 Scholarly Commons Working Group</a>	
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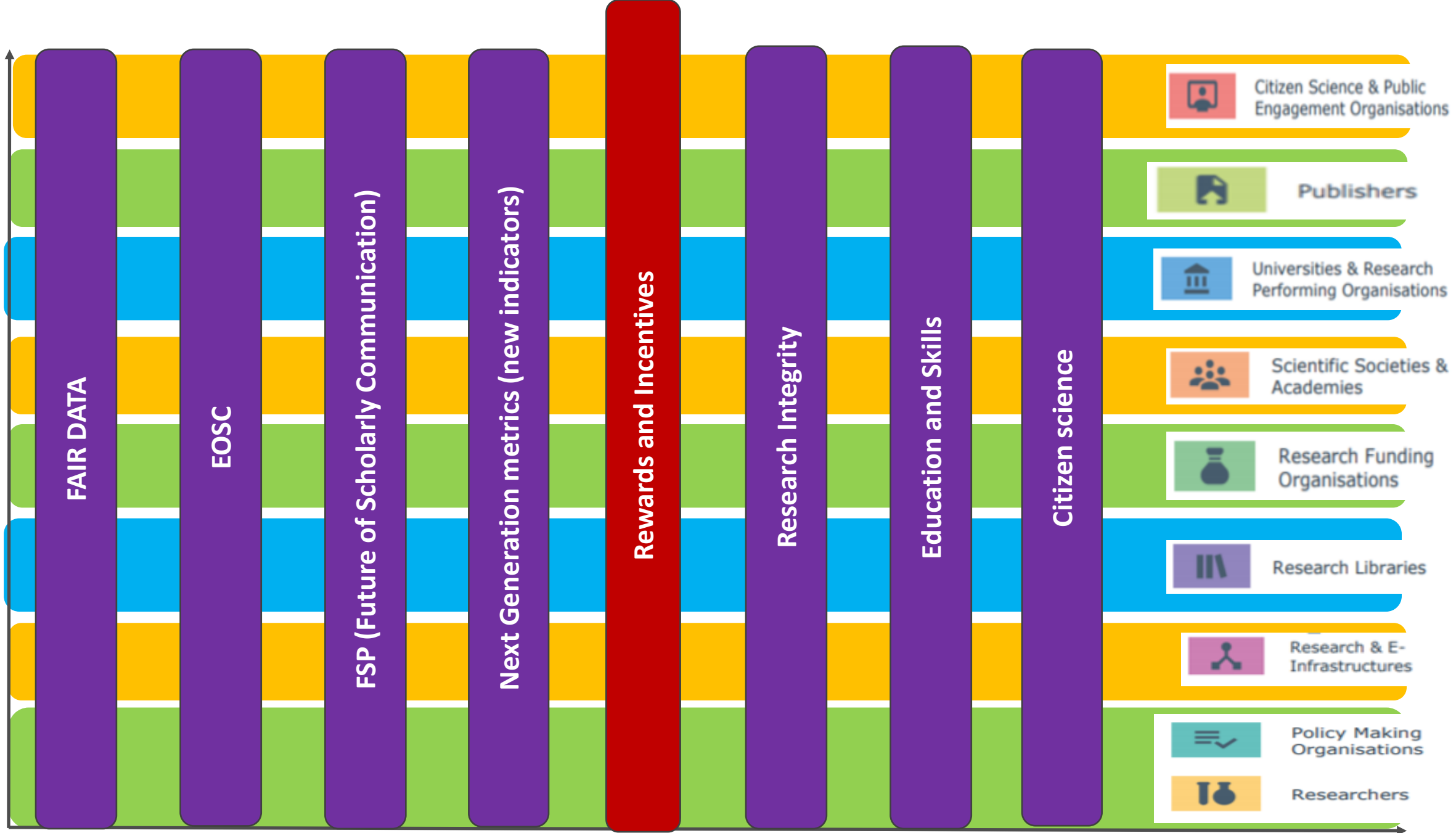
YEAR	NAME	URL	ASPECT	ORGANIZATION	AUTHORS/SIC
1964-2008	Helsinki Declaration	<a href="https://www.wma.net/policies-post/wr">https://www.wma.net/policies-post/wr</a>	other	World Medical Association	
1986	Free Software Definition	<a href="https://en.wikipedia.org/wiki/The_Fre">https://en.wikipedia.org/wiki/The_Fre</a>	code&software		Richard Stallm
1996	Bermuda principles	<a href="https://en.wikipedia.org/wiki/Bermuda">https://en.wikipedia.org/wiki/Bermuda</a>	data		multiple
1998	Open Source Definition	<a href="https://opensource.org/osd-annotate">https://opensource.org/osd-annotate</a>	code&software	Open Source Initiative	Bruce Perens
2002	Budapest Open Access Initiative	<a href="http://www.budapestopenaccessinitia">http://www.budapestopenaccessinitia</a>	open access		24
2003	Berlin Declaration	<a href="http://openaccess.mpg.de/Berlin-Dec">http://openaccess.mpg.de/Berlin-Dec</a>	open access		7 (? as acknow
2003	Bethesda Statement on Open Access Publishing	<a href="http://dash.harvard.edu/handle/1/472">http://dash.harvard.edu/handle/1/472</a>	open access		19 (? original s
2003	Fort Lauderdale data sharing gentleman's agreement	<a href="https://en.wikipedia.org/wiki/Fort_Lau">https://en.wikipedia.org/wiki/Fort_Lau</a>	data	Wellcome Trust	
2004	UPSIDE principles on data and materials	<a href="http://www.pnas.org/content/101/11/3">http://www.pnas.org/content/101/11/3</a>	data		
2005	OKF Open Definition	<a href="http://opendefinition.org/">http://opendefinition.org/</a>	opencience&multiple	OKF	no individuals
2005	Salvador Declaration on Open Access	<a href="http://www.iamf.org/meetings/open">http://www.iamf.org/meetings/open</a>	open access	International Seminar on O	

# Challenges = Building blocks

1. Removing barriers and **creating incentives** (alternative/next generation metrics, research integrity-AI).
2. Developing **infrastructures** for Open Science (e.g. European Open Science Cloud, EOSC).
3. Embedding Open **Science in Society** (citizen science, public engagement... knowledge coalitions to address societal challenges).

**PRACTICE** → Revisiting the challenges/pillars & **PCIs**

Stakeholders / Actors of Open Science



Open Science challenges / pillars in EUROPE

# An urgent need to reform

Assessment processes relying predominantly on journal- and publication-based metrics **can be a hurdle to recognising diverse contributions and may negatively affect the quality and impact of research.**

They also contribute to an **unhealthy research culture** and an **unaffordable publication system.**



# An urgent need to reform

## A public problem

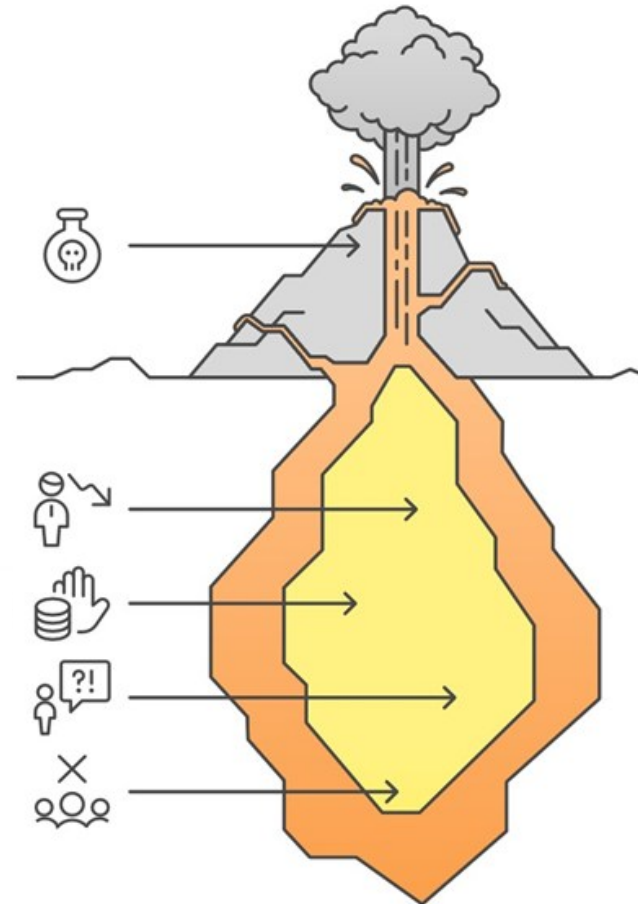
**UNSUSTAINABLE R&I  
SYSTEMS**

**Abusive comercial practices**

**Private digital infrastructures**

**Lack of transparency and reproducibility**

**Lack of coordination among stakeholders**



GOBIERNO  
DE ESPAÑA

MINISTERIO  
DE CIENCIA, INNOVACIÓN  
Y UNIVERSIDADES



# An urgent need to reform

nature

[Explore content](#) ▾

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[nature](#) > [news feature](#) > article


News Feature | Published: 25 May 2016

## 1,500 scientists lift the lid on reproducibility

[Monya Baker](#)

[Nature](#) 533, 452–454 (2016) | [Cite this article](#)

274k Accesses | 3479 Citations | 5250 Altmetric | [Metrics](#)

 This article has been [updated](#)

# An urgent need to reform (even more?)

<https://elpais.com/ciencia/2026-02-05/el-cientifico-me-lo-i-nvent-o-y-los-numeros-primos-de-las-embarzadas-un-matematico-expone-la-estafa-de-las-revistas-depredadoras.html>

EL PAÍS |  Suscríbete por 0,19 € a la semana

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**Ciencia / Materia** ASTROFÍSICA · MEDIO AMBIENTE · INVESTIGACIÓN MÉDICA · MATEMÁTICAS · PALEONTOLOGÍA

ÉTICA CIENTÍFICA >

## El científico Me-Lo I Nvent O y los números primos de las embarazadas: un matemático expone la estafa de las revistas depredadoras

El español Pascual Diago ha publicado un delirante estudio para denunciar la invasión de editoriales fraudulentas en la ciencia



# New standards to quality



Spanish Reproducibility Network



SPRN.ES es el nodo español de [International Reproducibility Networks](#), una red formada por un equipo multidisciplinar, regida por pares, cuyo propósito es el de promover y apoyar prácticas de reproducibilidad en la investigación científica, estableciendo actividades de formación, diseñando y evaluando prácticas de mejora de la reproducibilidad científica, difundiendo las mismas y trabajando con

<https://sprn.es>



# OSPP final report: (2016-2020)

1. An academic career structure that fosters outputs, practices and behaviours to maximise contributions to a shared research knowledge system.
2. A research system that is reliable, transparent and trustworthy.
3. A research system that enables innovation.
4. A research culture that facilitates **diversity** and **equity of opportunity**.
5. A research system that is built on evidence-based policy and practice.



## Progress on Open Science: Towards a Shared Research Knowledge System

Final Report of the Open Science Policy Platform

# Implementation: What are PCIs... for OPEN SCIENCE

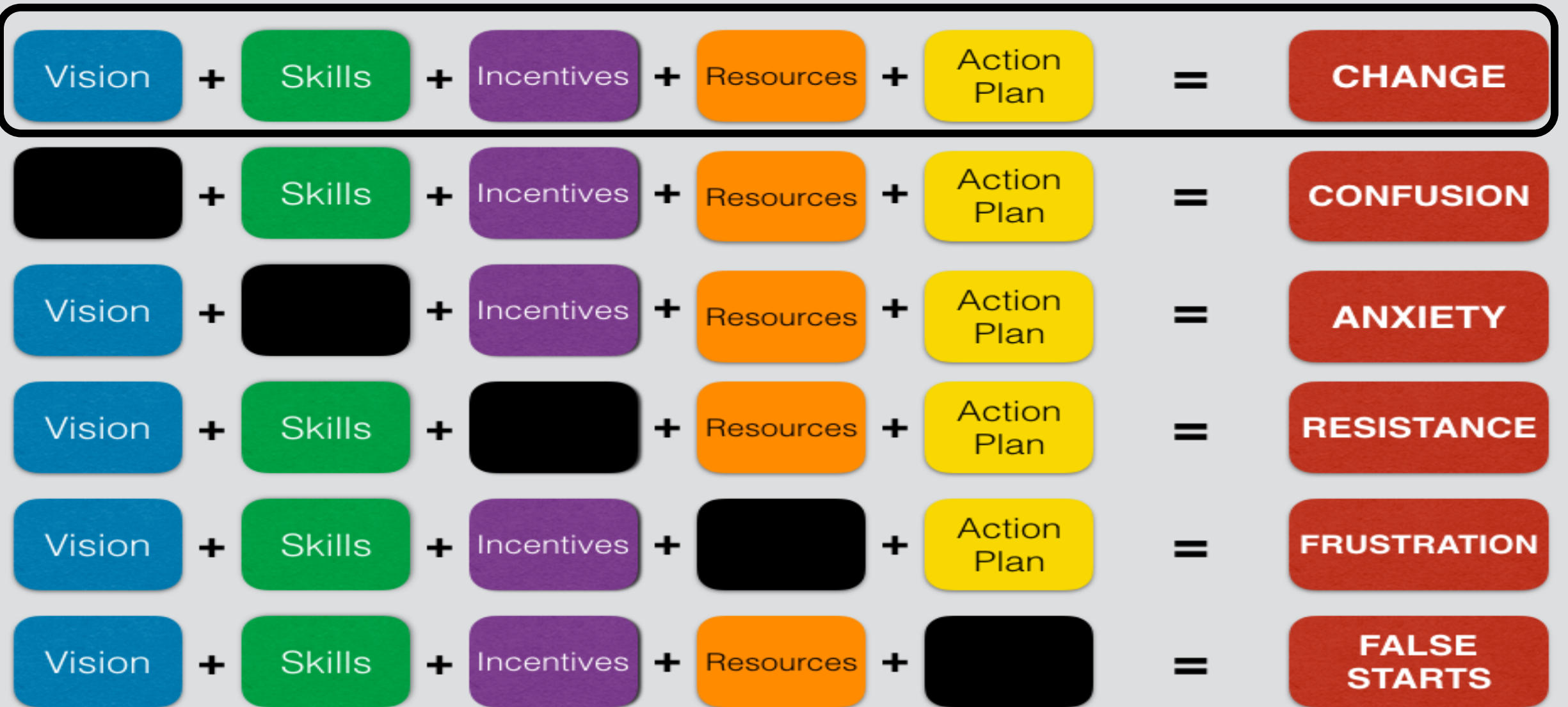
- **Commitments**
- Actual, **realistic** and **affordable**... in a level where the proponent has *“jurisdiction”*
- **Alignment** at country level → OS international
- **Effect** → real **implementation**
- Answer to the question: *What **CAN** I do to... change the reward system, to apply new indicators, etc.*
- Open science at “action level” (**practical**)

# Open Science @Universities now: HOW?



- How to **incentivize** the systemic change?
  - How does it affect our researchers? → **Promotion, research assessment...**
  - How does it affect our research **infrastructures**? → New ones?
  - How does it affect our T&Learning? → **Data literacies?** (skills)
  - How does it affect to our researcher's **behavior** (research integrity)
- Public Institutions + **Transparency**

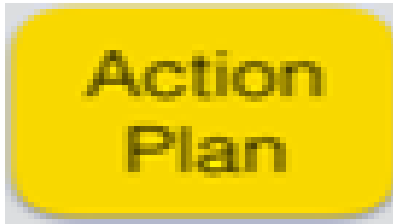
# Managing Complex Change



# PCIs example: INSTITUTION

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*Join us! Let's make it happen*



- **UniOS (Join us!): Open Science Unit** An operational unit to support and help OS @UC3M = seduction
  - Library + Research & Innovation Service +TI Service
  - + Researchers (including ECR)
- Bottom-up approach: **FOS pilot** (*Full Open Science Research Groups*): Volunteer → process → **badge**



**Full Open Science**

# Challenges

- **Cultural change** (researchers mindset)  
*[Darling, we need to talk!!]*
- **Education (Skills)** → training ECR, but also senior researchers
- **Attitude CC: Conviction & Confidence** →  
Demonstrate the INFLUENCE of Open Knowledge
- **Strategic alignment** with internal policies, and of course (hopefully) with the NATIONAL ones

# Policies (national level)



## Spain

Spanish **Science** Law (Ley 17/2022)

<https://www.boe.es/eli/es/l/2022/09/05/17>

Spanish Law of the **University System** (Ley 2/2023)

<https://www.boe.es/eli/es/lo/2023/03/22/2/con>

**ENCA** (Spanish Strategy on Open Science 2023-2027)

<https://www.boe.es/eli/es/lo/2023/03/22/2/con>



- Promote the **proper management of research data generated** by the national R+D+I system through the FAIR principles (Findable, Accessible, Interoperable, Reusable) to increase their localisation, accessibility, interoperability and reusability.
- Implement open and **free access by default to scientific publications** and results financed directly or indirectly with public funds, for all citizens.
- Ensure the **existence of interoperable digital infrastructures** that are sufficiently robust and well-articulated to absorb the impact of the implementation of a national open science policy and facilitate their integration into the international ecosystem and their integration, where appropriate, into the European Open Science Cloud (EOSC).
- Establish **new research evaluation mechanisms** and a system of incentives and recognitions aimed at promoting open science practices, as well as **train all staff (researchers, managers, funders, evaluators)** to align their professional performance with the principles of open science.

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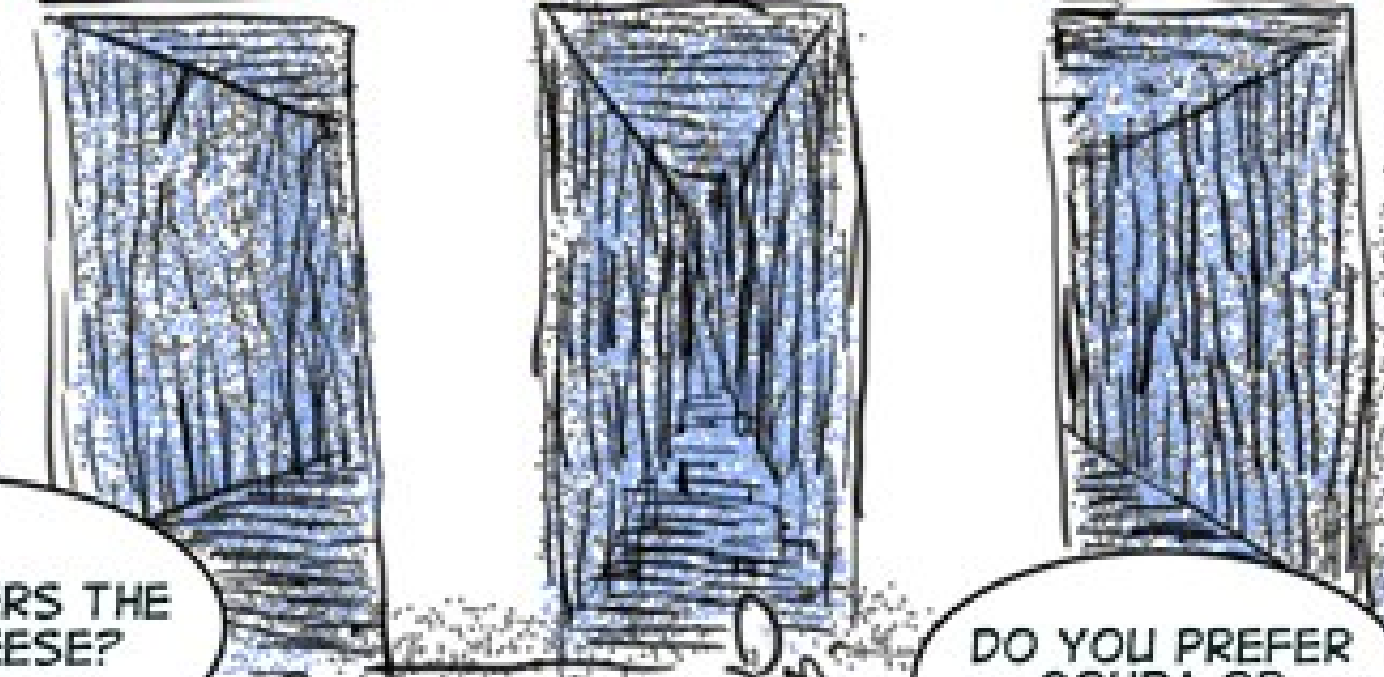
REPOSITORY

HYBRID  
JOURNAL

OPEN  
ACCESS  
JOURNAL

WHICH OFFERS THE  
MOST CHEESE?

DO YOU PREFER  
GOLDA OR  
CAMEMBERT?

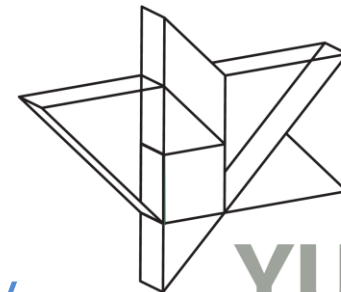




## If science is not open... it is not going to help us

Open Science and Open Knowledge accelerate research and advance to face social challenges (COVID pandemic, SDGs).

The European Commission and many other political and scientific institutions, as well as research funding agencies, promote the urgent implementation of Open Science.

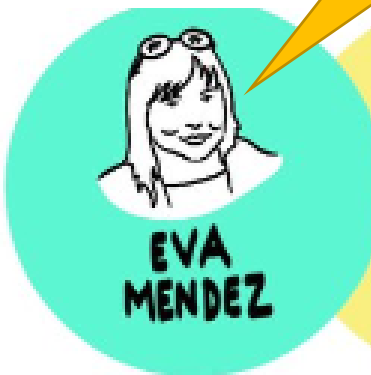


**YUFERING**  
TRANSFORMING R&I THROUGH  
EUROPE-WIDE KNOWLEDGE TRANSFER

DIY-Calendar: [https://zenodo.org/record/5961563#.YI\\_eUOjP3IV](https://zenodo.org/record/5961563#.YI_eUOjP3IV)



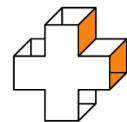
THANK YOU!!!!



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**@evamen**

# Competence Centre



Discover the Spanish Competence Centre for Open Science and Research Data, a hub that promotes Open Science and FAIR data practices in Spain



Spanish Reproducibility Network



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<https://sprn.es>



<https://opensciencelab.uc3m.es>