Human Brain Project

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Realising Ethics and Responsible Innovation in a Large Neuroinformatics Project

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frontiers in Human Neuroscience

REVIEW
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Check for updates

Beyond Research Ethics: Dialogues in Neuro-ICT Research

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The increasing use of information and communication technologies (ICTs) to help facilitate neuroscience adds a new level of complexity to the question of how ethical issues of such research can be identified and addressed. Current research ethics

Rome Declaration

Responsible Research and Innovation (RRI) is the on-going process of aligning research and innovation to the values, needs and expectations of society.

21.11.2014

RRI Tools
RESEARCH COMMUNITY
RRI is a way to do research that takes a long-term perspective on the type of world in which we want to live

Human Brain Project

- 2013-2023
- EC funding of €~450m
- 100+ partner organisations
- 500+ scientists / researchers

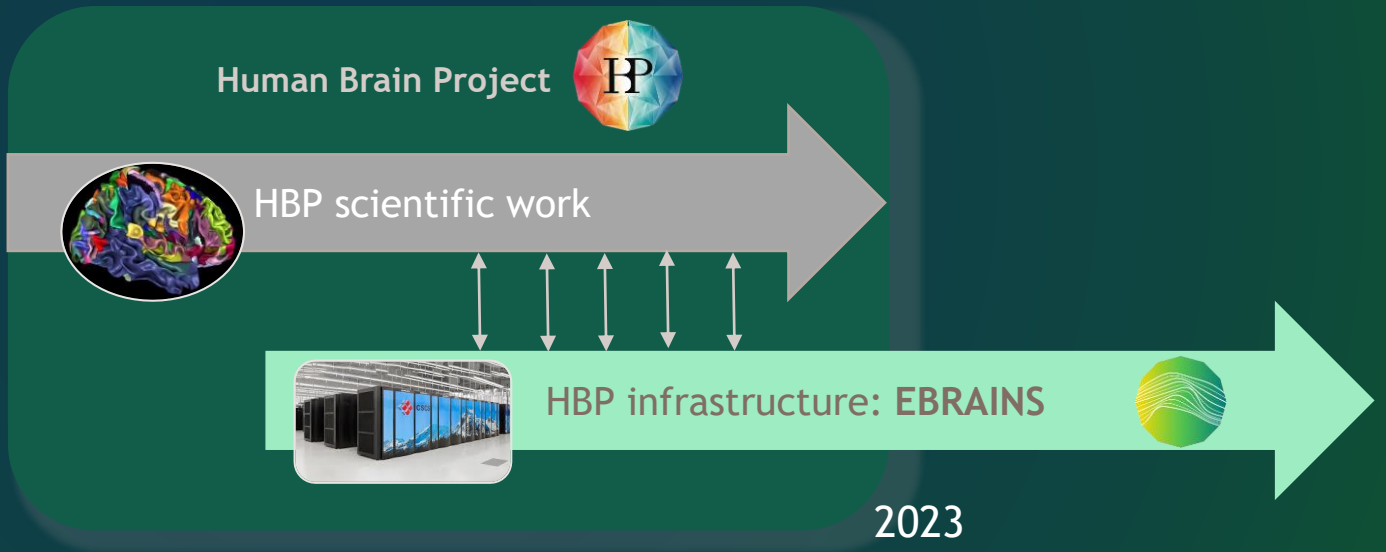
To tame brain complexity, the project is building a research infrastructure to help advance neuroscience, medicine, computing and brain-inspired technologies - EBRAINS. The HBP is developing EBRAINS to create lasting research platforms that benefit the wider community.

EBRAINS' mission:
Enabling brain research advances and innovation

It builds **on the work of the Human Brain Project** and **takes it to the next level**

EBRAINS offers the science community **state-of-the art**

- **Brain data**
- **Simulation and modelling tools**
- **Access to (super) computing resources**

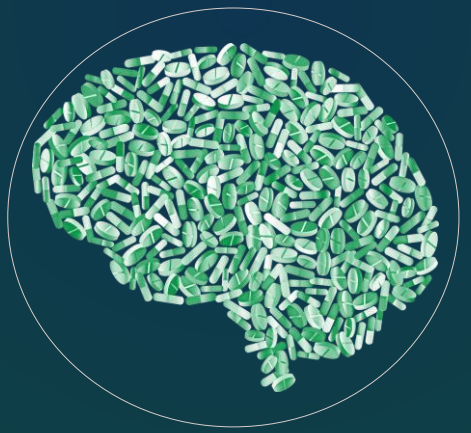


EBRAINS Human Brain Project

EBRAINS Focus areas

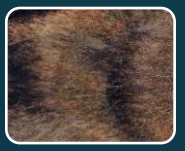
Covering and ensuring equilibrium between three areas:

Neuroscience	Brain Medicine	Brain-inspired technologies



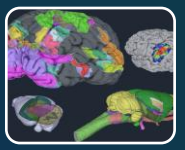
What EBRAINS brings to the scientific community

EBRAINS aims at **accelerating collaborative brain research** with a comprehensive package of data, tools and facilities.



Data and Knowledge

- Online solutions to facilitate sharing of and access to research data, computational models and software

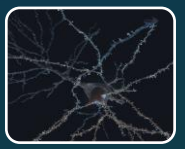


Atlases

- Navigate, characterise and analyse information on the basis of anatomical location

Simulation

- Solutions for brain researchers to conduct sustainable simulation studies and share their results



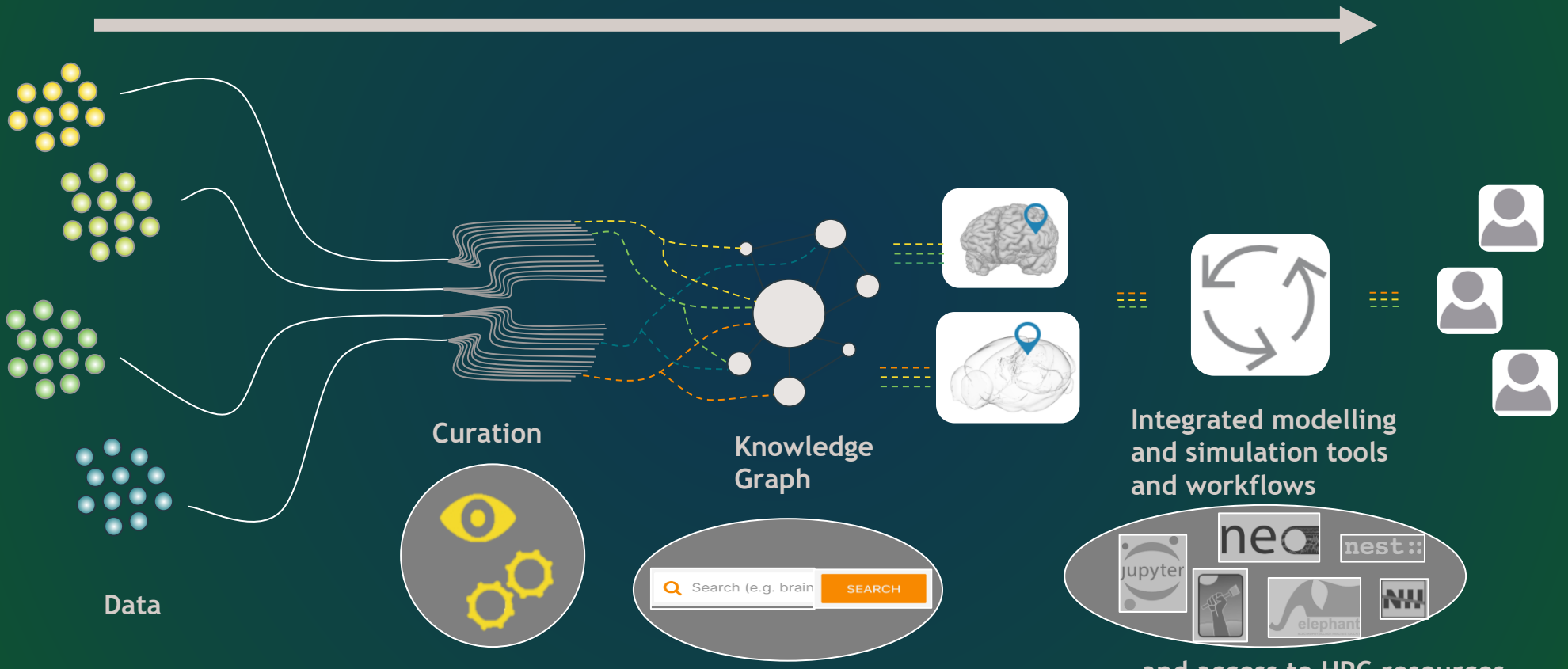
Brain-Inspired Technologies

- Understand and leverage the computational capabilities of spiking neural networks

Medical Data Analytics

- The Medical Data Analytics service provides two unique EBRAINS platforms, covering key areas in clinical neuroscience research

An integrated platform with cutting-edge workflows



EBRAINS Human Brain Project

Involving a broad network of stakeholders

NEUROSCIENCE
HBP and non-HBP academic centers
Strong links with Neuroscience associations in Europe

NEUROLOGY
Pan-European and national neurology and neuro-degenerative disease associations; Brain centers and hospitals; Patient associations

INDUSTRY
Players in the digital, tech, medical spaces, Innovators, Pharma companies, Health care providers,

BRAIN-INSPIRED TECHNOLOGIES
Academic, industry and start-up network

OTHER BRAIN INITIATIVES
- EBC, EBRA, EAN
- International Brain Initiative
- Global Brain Consortium
- IBRO

OTHER EU INITIATIVES
Horizon EU, EU Health Data Space, IMI, FLAG-ERA, AI4EU and other RIs: Elixir, PRACE, BioExcel, BioImaging, EOSC, …

GOVERNMENT AND POLICY MAKERS
European, national, regional and local

CIVIL SOCIETY
NGOs, press & media, general public.

EBRAINS: a distributed Research Infrastructure spread throughout Europe

Bringing the best of the national expertise and creating synergies

Central Hub

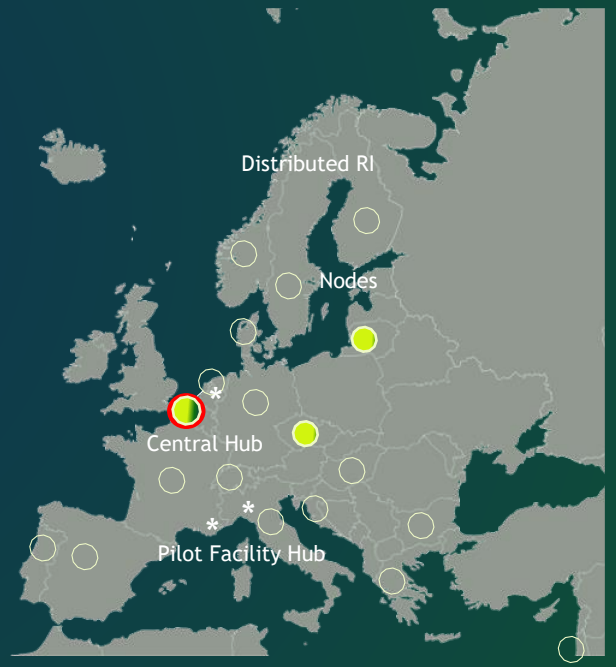
Brussels

National Nodes

Group of local institutions providing key EBRAINS services

Local institutions

Facility Hubs



EBRAINS Human Brain Project

Ethical and Social Questions in the HBP

- Research ethics and compliance
  - Animal research
  - Human research
- Data-related
  - Data protection
  - Responsible data governance
- Neuroethics
  - Consciousness
- Dual use, misuse
- Diversity and inclusion
- Commercial exploitation
- Societal consequences
- Licence to operate
- New (since 2021): AI as an ethical issue

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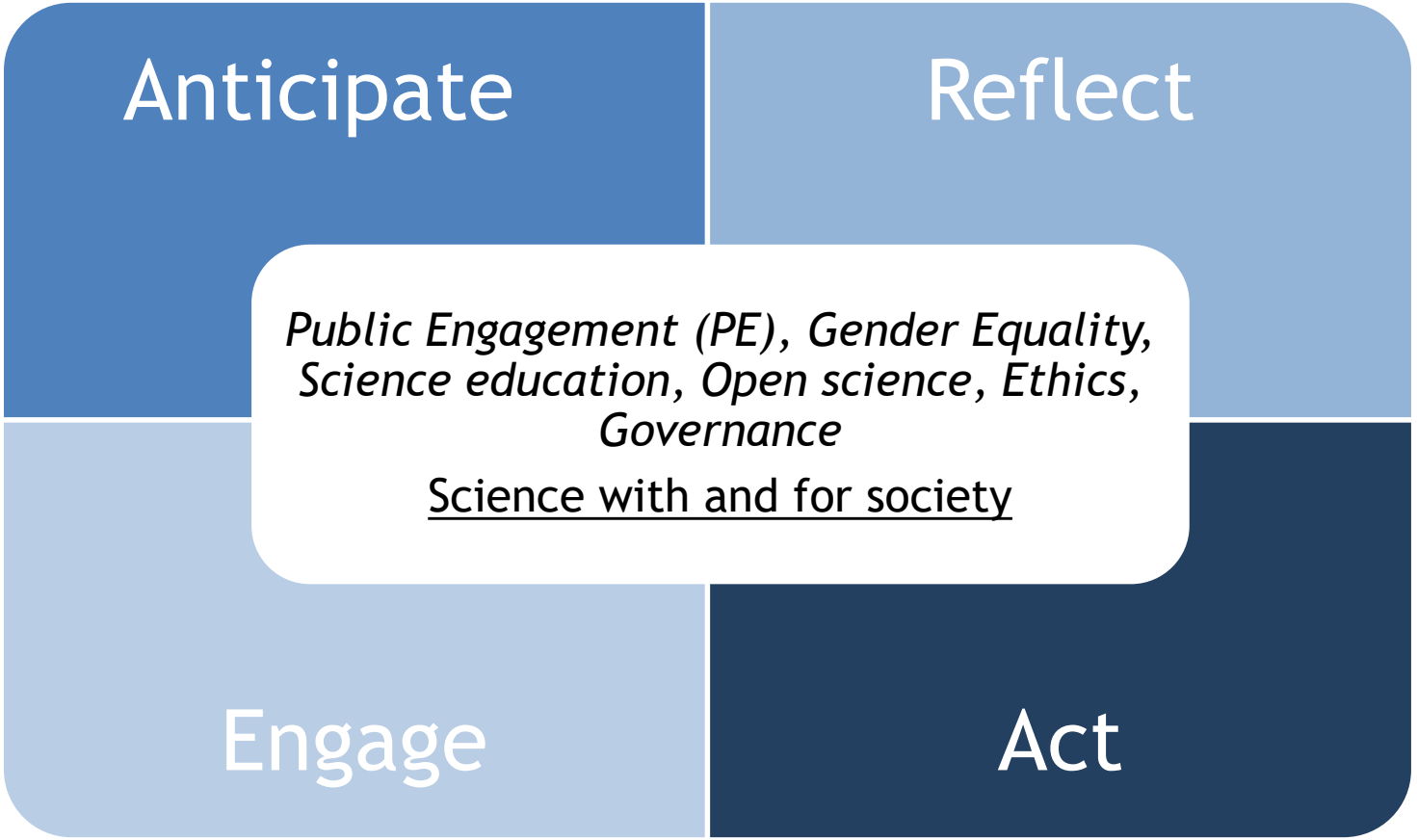
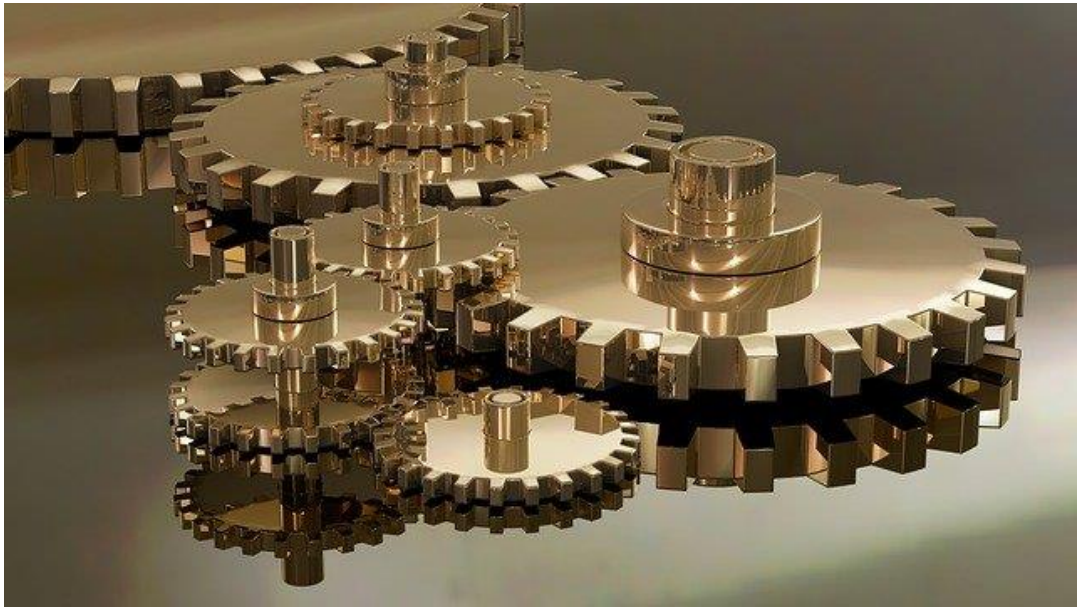
Responsible Research and Innovation in the HBP



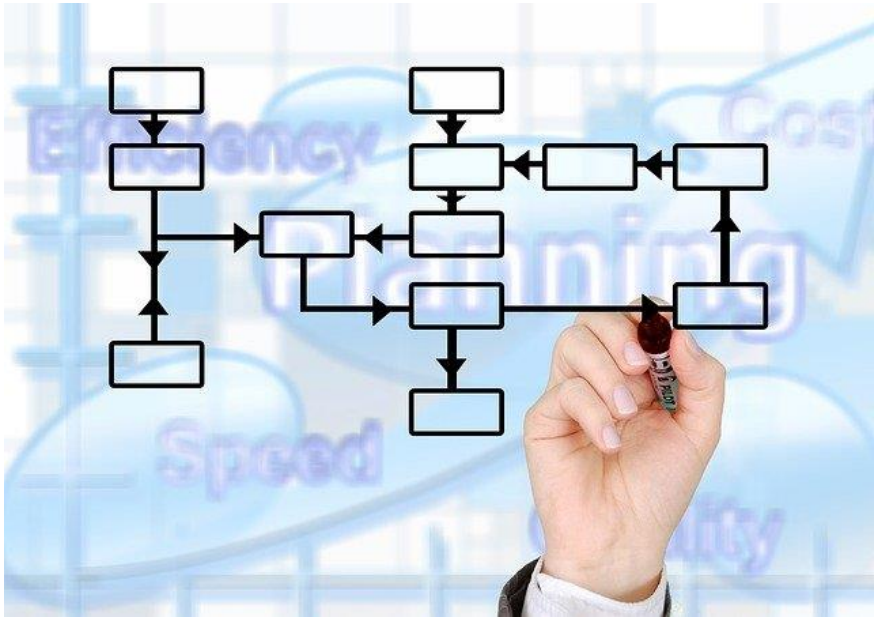
RRI Activities

- Research on various RRI topics
- Neuroethics and philosophical reflection
- Foresight
- Public engagement
- Researcher awareness
- Ethics support
- Capacity development

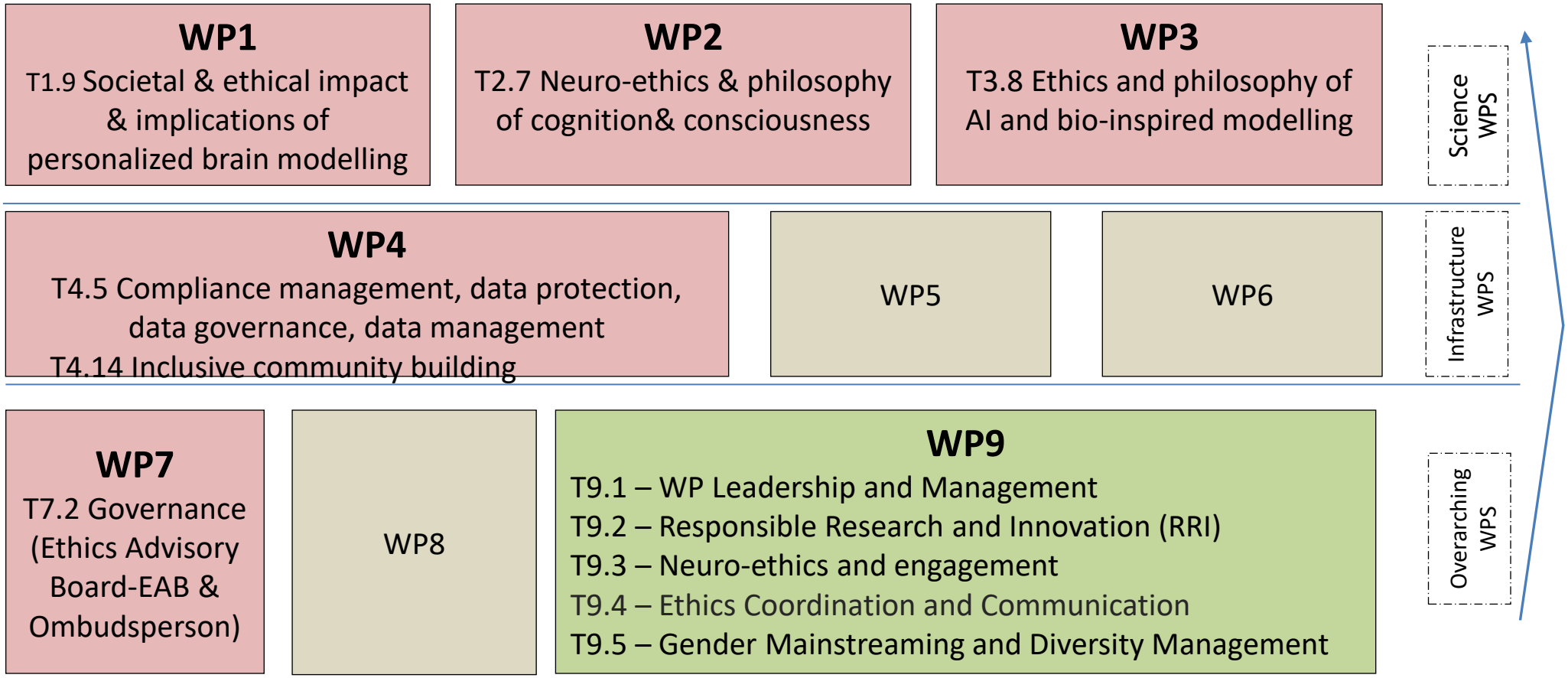


RRI Structures

- Ethics Advisory Board (external experts)
- Ombudsperson
- Ethics Rapporteur Programme
  - Annual update (1-pager)
- Compliance management workflow
- Data Governance Working Group
- Dual Use Working Group
- Diversity and Equal Opportunities Committee
- Representation in project governance
  - Ethics Director
  - RRI WP lead in Science and Infrastructure Board

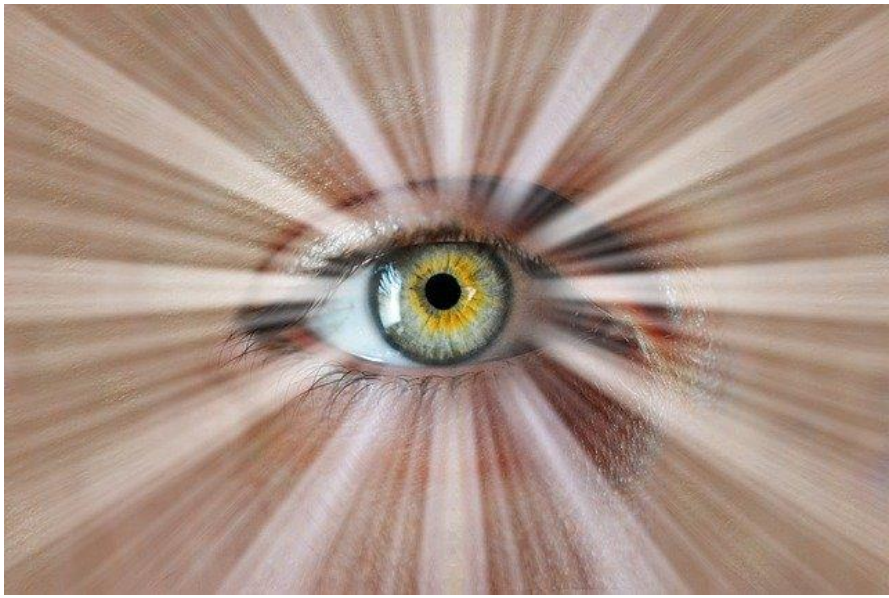


Structure of Ethics-related Tasks in SGA3



Lessons Learned (2013-2020)

- Extensive Public Engagement Can Inform Project Decisions
- In Practice Compliance Issues Tend to Dominate the RRI Agenda
- Interdisciplinary Collaboration is Challenging when Implementing RRI
- Interpretations of RRI Continue to be Subject of Debate
- Implementing RRI Reveals Gaps in Knowledge of Substantive Issues
- Success of RRI Implementation is Difficult to Prove



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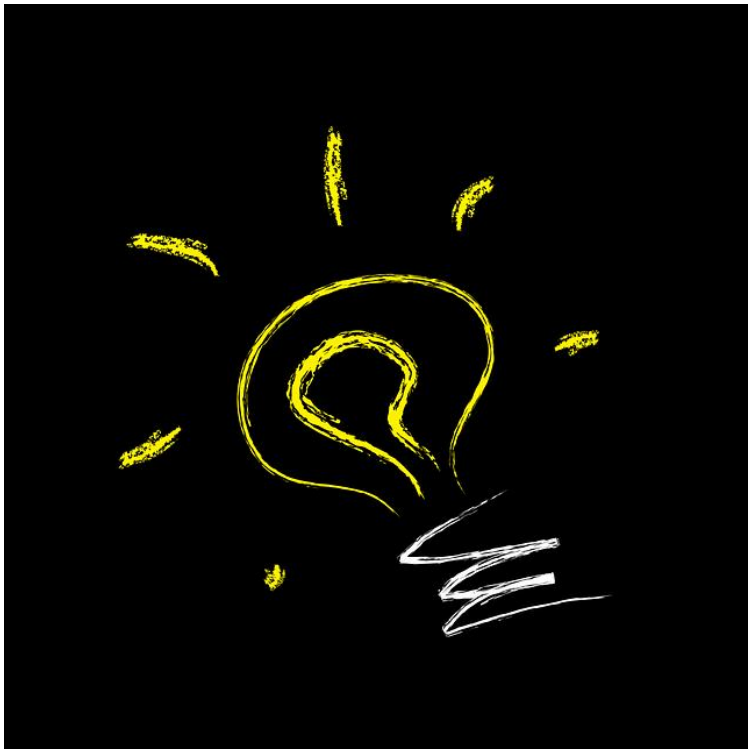
Some further insights

- RRI remains a contested concept
- Expectation management is important
- Uncertainty and conflict remain
- RRI is not a solution, but a process
- RRI needs to co-evolve with the science



Future Plans (2022-2023): Responsibility by Design

Preparation for the transition from research project to distributed research infrastructure

- Organisational Integration of RRI
- Ethics and Society Vision
- EBRAINS Ethics and Society Committee
- Community and Capacity Building
- From Research to Innovation and Commercial Exploitation
- Global RRI Engagement and ensuring societal benefit

AI and Ethics
https://doi.org/10.1007/s43681-022-00201-4

ORIGINAL RESEARCH

Check for updates

Assessing the ethical and social concerns of artificial intelligence in neuroinformatics research: an empirical test of the European Union Assessment List for Trustworthy AI (ALTAI)

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Abstract

Ethical and social concerns are a key obstacle to the adoption of artificial intelligence (AI) in the life sciences and beyond. The discussion of these issues has intensified in recent years and led to a number of approaches, tools and initiatives. Key amongst them is the idea of ex-ante impact assessments that aim to identify issues at the early stages of development. One

Resources

- Responsibility by Design paper in JRI https://doi.org/10.1080/23299460.2021.1955613
- HBP website https://www.humanbrainproject.eu/en/social-ethical-reflective/
- HBP education https://www.humanbrainproject.eu/en/education/participatecollaborate/curriculum/online-course/research-ethics-societal-impact/
- EBRAINS data governance https://ebrains.eu/terms
- Ethics Dialogues http://www.ethicsdialogues.eu/
- EBRAINS Ethics and Society Vision https://ebrains.eu/ethics-and-society-vision/