

Exploring 'Do No Harm' Principles in Open Research Communities

Malvika Sharan (Pronouns: She/her)

2nd International Research Software Funders Workshop

19 September 2023



Structure of this Talk

1. General **introduction** of global divide
2. Contextualisation for **Research Software**
3. The **'Do No Harm'** framework
4. Some **practical ways** forward

Terminology:

- **LMIC**: Low-to-Middle Income Countries
 - Global South
- **HIC**: High Income Countries
 - Global North



1. General **introduction** of global divide
2. Contextualisation for Research Software
3. The 'Do No Harm' framework
4. Some practical ways forward



The Alan Turing Institute



Senior Researcher

Tools, Practices and Systems

The Alan Turing Institute, UK

- From India, European Citizen, UK resident
- PhD in Bioinformatics (2016)
- Computational and Open Science skill training: 2015 -
- Open Science Community Building started in EMBL: 2016 -
- Co-director OLS (formerly Open Life Science): 2019 -
- Co-Lead of The Turing Way

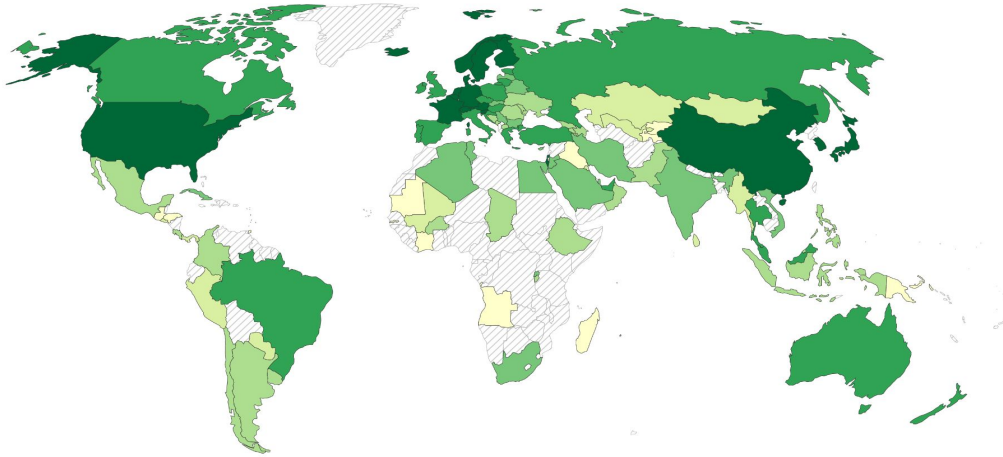


Economic & Knowledge Divide

Research & development spending as a share of GDP, 2021

Includes basic research, applied research, and experimental development.

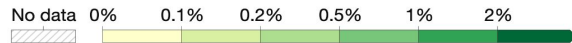
Our World
in Data



Total global R&D expenditures:
\$2.47 trillion in 2022

\$726 billion in 2000

10 account for 85% of total



Source: UNESCO (via World Bank)

OurWorldInData.org/research-and-development • CC BY

Note: Spending includes current and capital expenditures (public and private) on research.

OECD, Research and development (R&D) - Gross domestic spending on R&D - OECD Data. (2023).

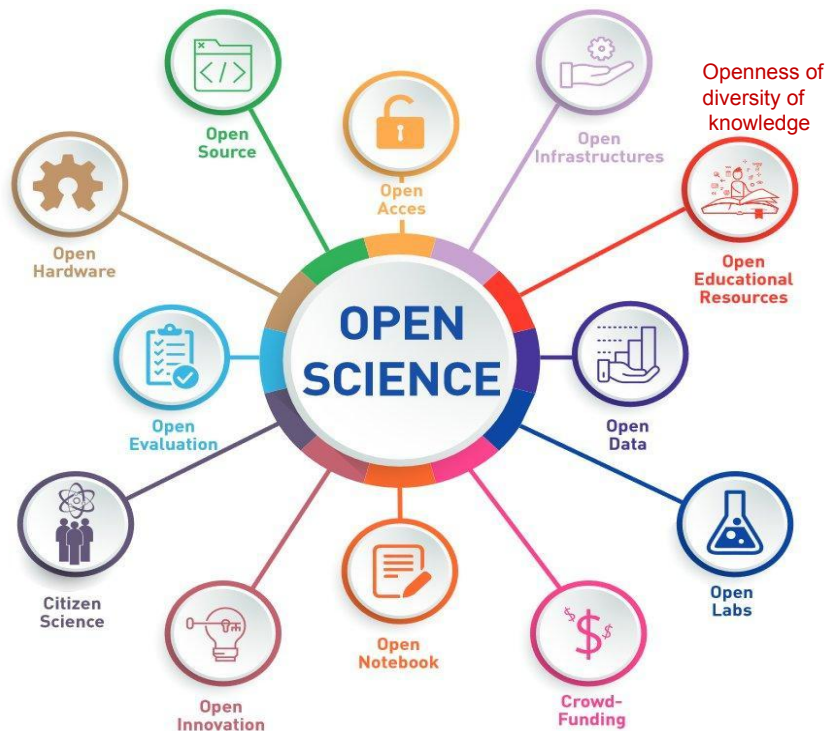
<https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm>.

ourworldindata.org/grapher/research-spending-gdp

Zenodo:

<https://doi.org/10.5281/zenodo.3332807>. Presentation DOI: [10.5281/zenodo.7620215](https://doi.org/10.5281/zenodo.7620215)

Integrating Open Science and Reproducibility



| | | Data | |
|----------|-----------|--------------|---------------|
| | | Same | Different |
| Analysis | Same | Reproducible | Replicable |
| | Different | Robust | Generalisable |

Toward a UNESCO Recommendation on Open Science: **Canadian Commission for UNESCO** By Ella Chan, Dick Bourgeois-Doyle, Michael Donaldson, and Eleanor Haine-Bennett, Ottawa, Canada, April 2020, UNESCO presentation of 17 Feb 2021

@malvikasharan, Presentation DOI: 10.5281/zenodo.8361334

Shared Mission, but Different Barriers

Goals of openness may differ, but share **common mission**

1. Produce public good
2. Encourage collaboration
3. Broaden the diversity of actors



Shared Mission, but Different Barriers

Goals of openness may differ, but share common mission

1. Produce public good
2. Encourage collaboration
3. Broaden the diversity of actors

Barriers are different for the Global South researchers

1. Language and culture barriers
2. Lack of investment in research infrastructure
3. Imbalanced research collaborations



Recognition through Participatory Processes

“What requires recognition is not group-specific identity but the status of individual group members as full partners in social interaction. Misrecognition, accordingly, [is] social subordination - in the sense of being prevented from participating as a peer in social life.”

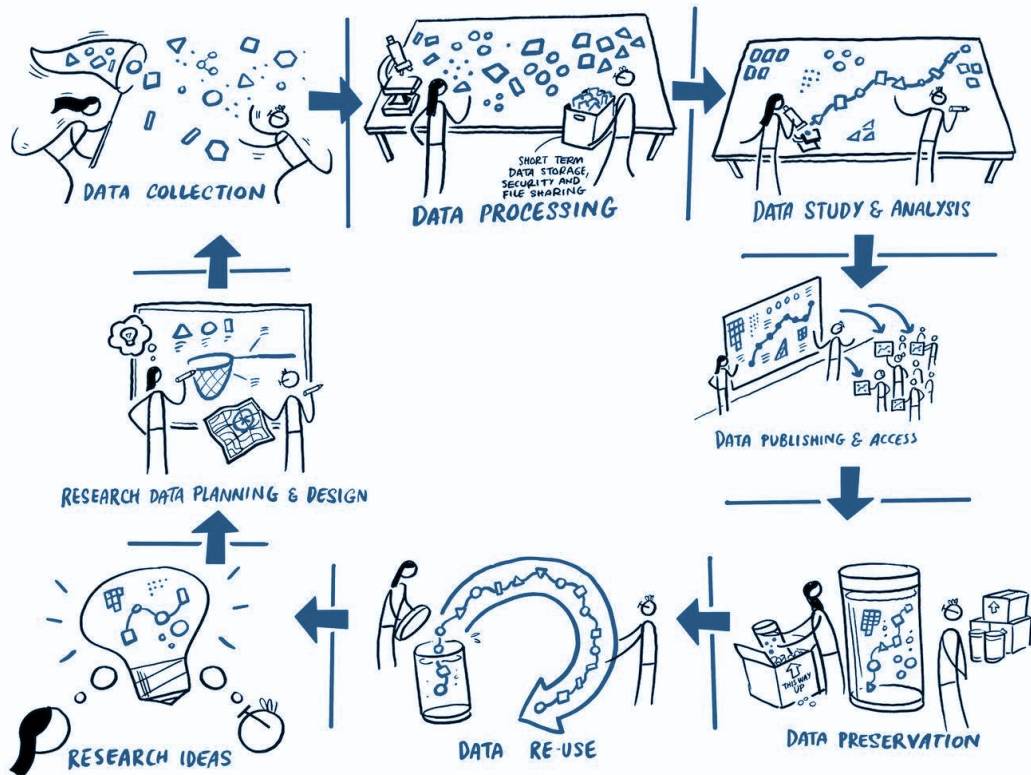
– Nancy Fraser, Rethinking Recognition

1. General introduction of global divide
2. Contextualising for **Research Software**
3. The 'Do No Harm' framework
4. Some practical ways forward

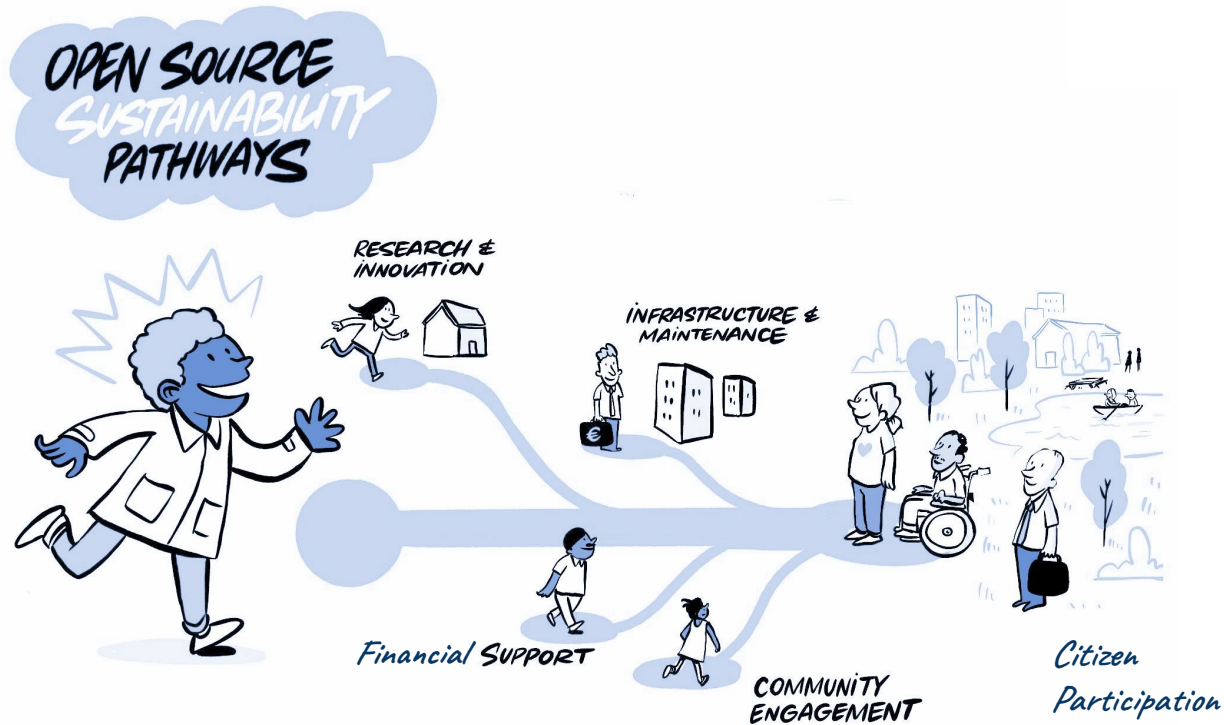


Contextualise in Research Software

| | | Data | |
|----------|-----------|--------------|---------------|
| | | Same | Different |
| Analysis | Same | Reproducible | Replicable |
| | Different | Robust | Generalisable |



Research Infrastructure Roles



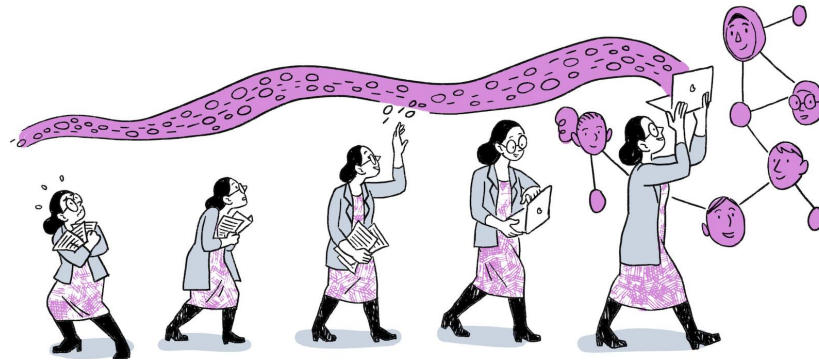
1. General introduction of global divide
2. Contextualisation for Research Software
3. The 'Do No Harm' framework
4. Some practical ways forward



“Do No Harm” Principle

“Do no harm (DNH) means taking a step back from an intervention to look at the broader context and mitigate potential negative effects [or harms] on the social fabric, the economy and the environment.”

– Jean Martial Bonis Charancle & Elena Lucchi, Humanity & Inclusion/F3E joint report



“Do No Harm” Principle

Threats of data misuse

Uneven distribution & access to resources

Outdated Incentives

Hidden infrastructure of care work

Language & culture Barriers

Poor governance and lack of diverse leaders

Evolving skill requirements

Volunteer labour

Knowledge gaps

Complex funding landscape

Concentration of power

Economic uncertainty



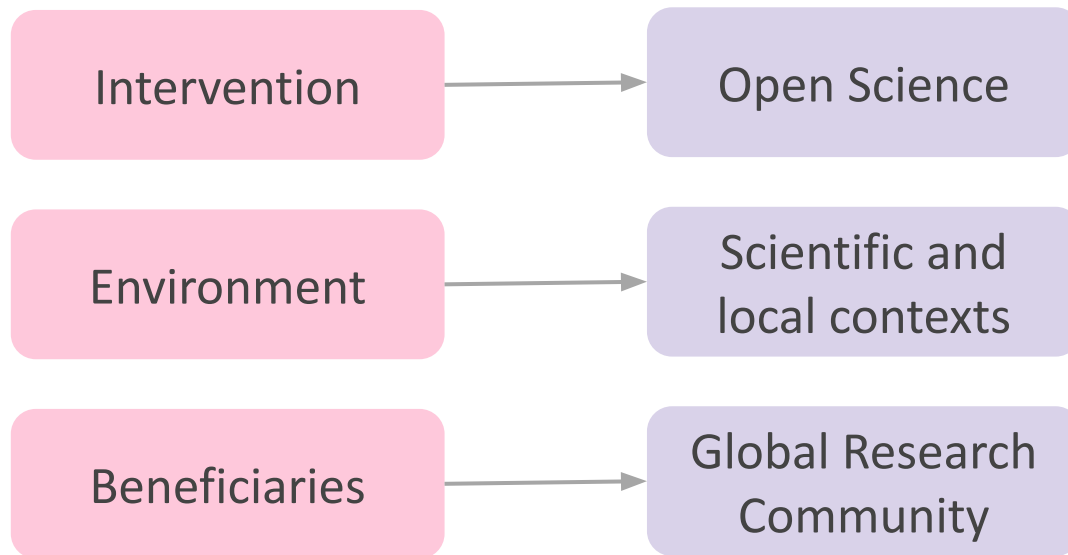
“Do No Harm” Principle Aligns with Open Practices

Intervention

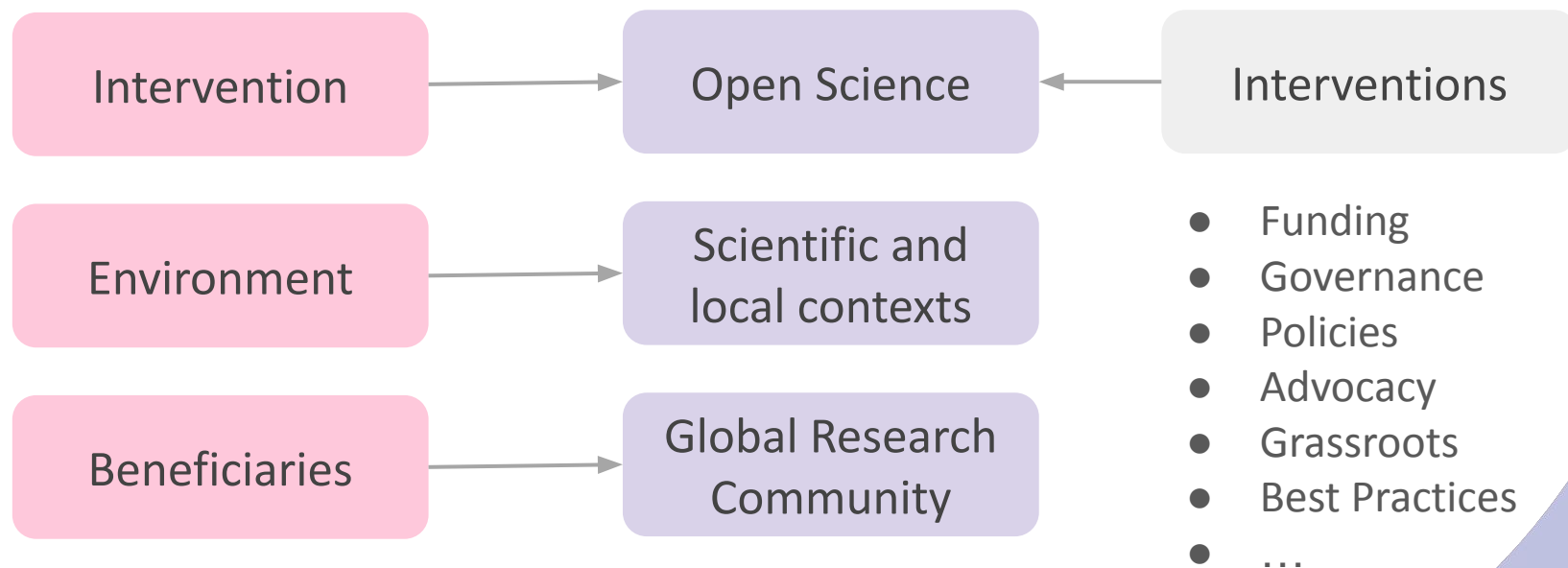
Environment

Beneficiaries

“Do No Harm” Principle Aligns with Open Practices



“Do No Harm” Principle Aligns with Open Practices



“Do No Harm” (Simple) Framework

1. Rights of Beneficiaries

All actors of research, research software communities and their (human) rights to science.

2. Functioning of communities and relation between actors

Governance/decision-making, participation and recognition for all kinds of contributions

Interventions

4. Environment & contexts

Researchers' context where they conduct their work, as well as broader environmental impact.

3. Local Economy

Achieving both scientific and economic equity through progress in scientific practices.

Negative Effects can be explained under Four Categories



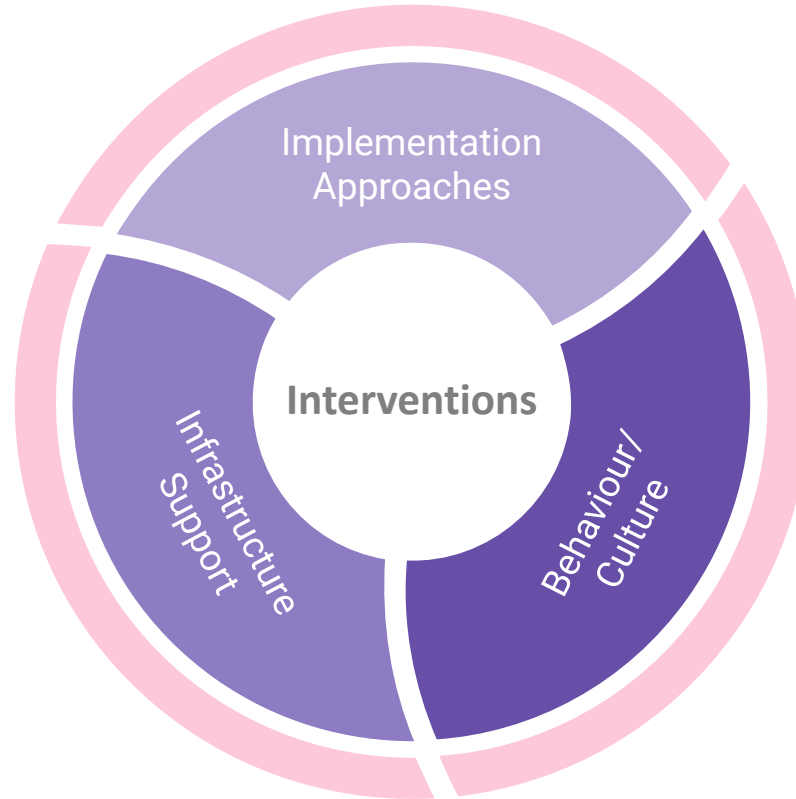
“Do No Harm” (Simple) Framework

1. Rights of Beneficiaries

All actors of research, research software communities and their (human) rights to science.

2. Functioning of communities and relation between actors

Governance/decision-making, participation and recognition for all kinds of contributions



4. Environment & contexts

Researchers' context where they conduct their work, as well as broader environmental impact.

3. Local Economy

Achieving both scientific and economic equity through progress in scientific practices.

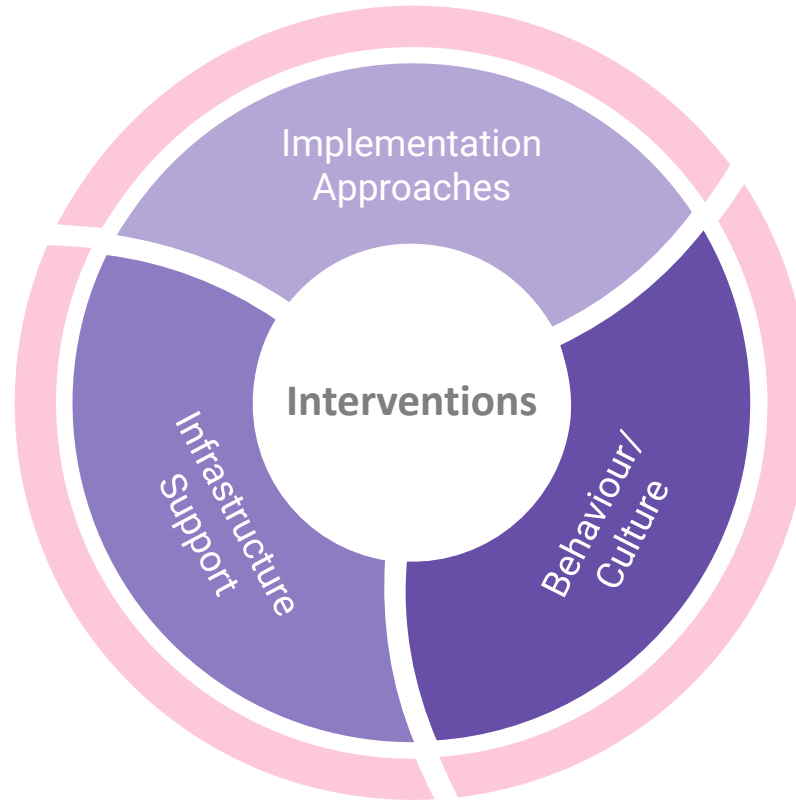
Negative Effects can be explained under Four Categories



“Do No Harm” (Simple) Framework

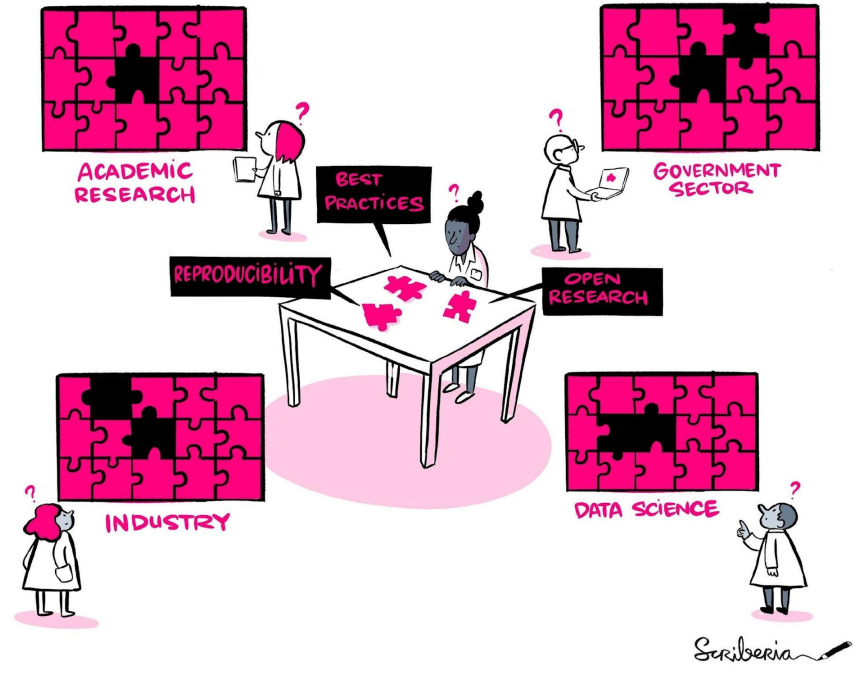
1. Rights of Beneficiaries

All actors of research, research software communities and their (human) rights to science.



Emerging Research Landscape

- Openness and reproducibility
- Inclusive project design
- Transparent communication
- Collaborative culture
- Research ethics
- Community building (EDIA)



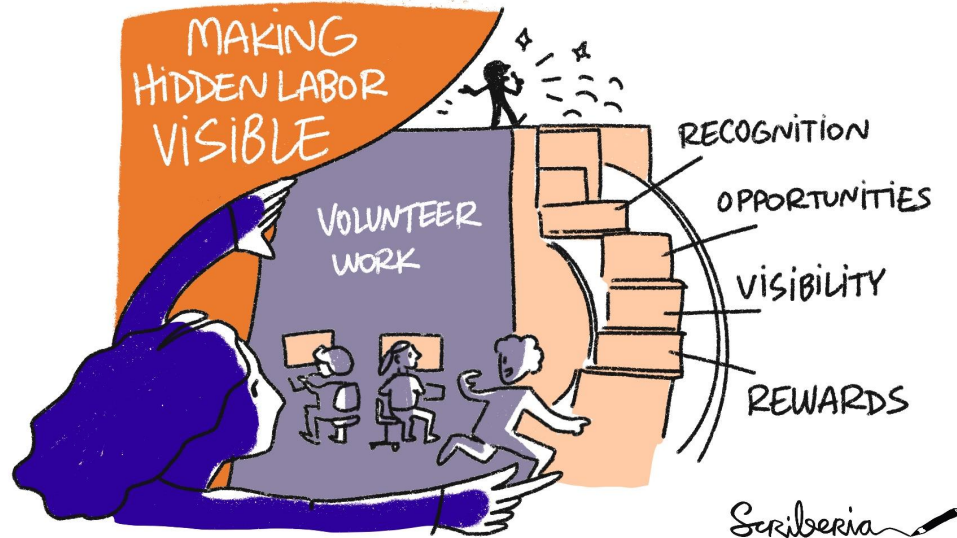
Research Roles & Responsibilities

- Project scoping
 - Funding
 - Data wrangling
 - Research engineering
 - Software management
 - Project leadership
 - Reporting/publication
 - Peer review and testing
 - Impact & Sustainability
 - ...
- Stakeholder engagement
 - Research collaboration
 - Adoption of open practices
 - Impact assessment
 - Policy compliance
 - Ethical considerations
 - Govt./Public feedback
 - Sharing 'Research Objects'
 - Archiving and preservation
 - ...
- Community management
 - Training and upskilling
 - Equitable & inclusive teams
 - Software Maintenance
 - Platforms & Documentation
 - Mentoring & career support
 - UX/UI development
 - Software auditing
 - Sustainability
 - ...

UK Research and Development Roadmap: Attract, retain and develop the talented, diverse people and teams that are essential to delivering our vision.

Research Roles & Responsibilities

Recognising and funding both technical and social infrastructure in research.

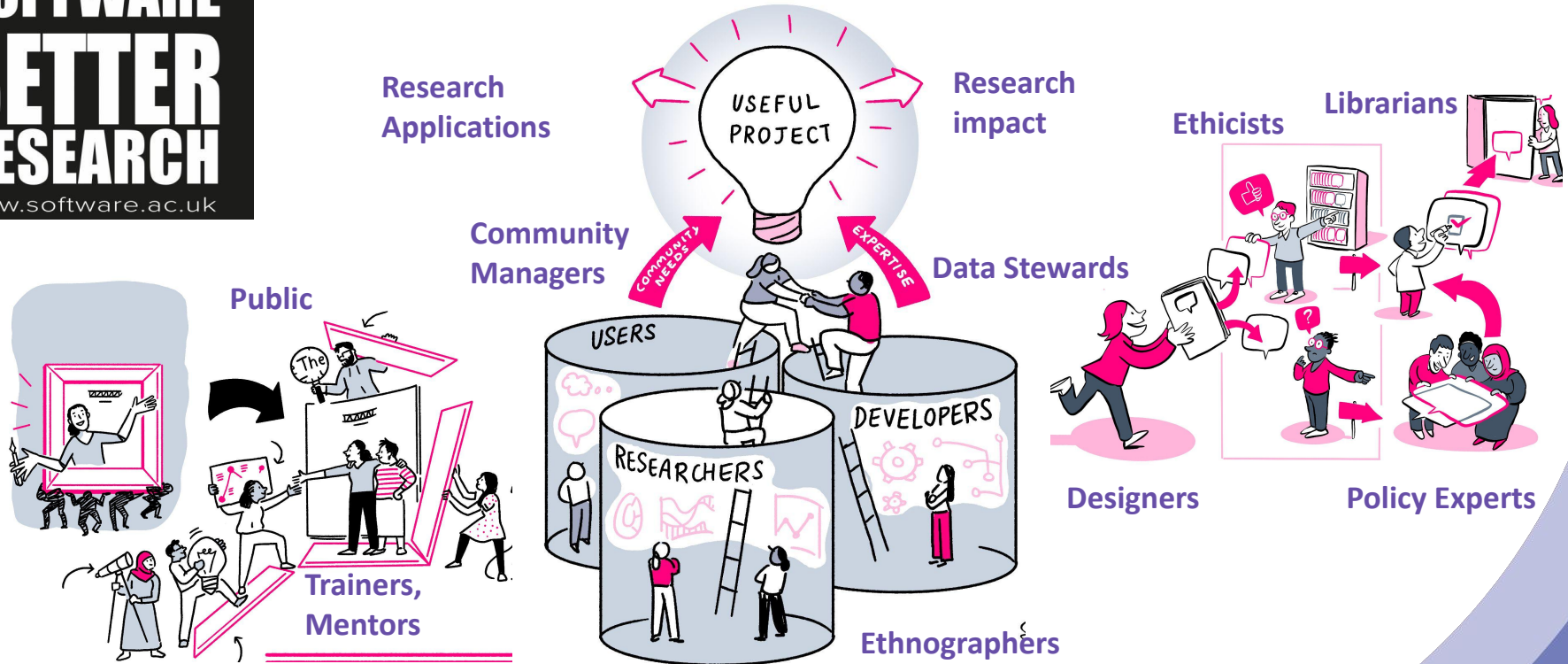


- Community management
- Training and upskilling
- Equitable & inclusive teams
- Software Maintenance
- Platforms & Documentation
- Mentoring & career support
- UX/UI development
- Software auditing
- Sustainability
- ...

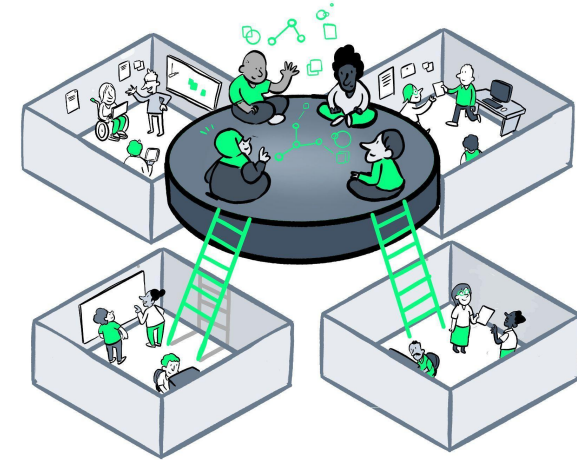
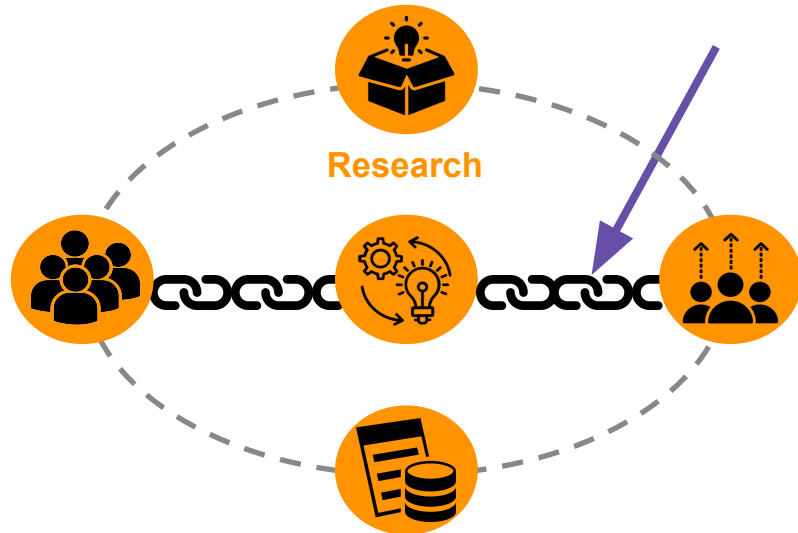
BETTER SOFTWARE BETTER RESEARCH

www.software.ac.uk

Diversifying Research Roles



Research Community Management



Research Community Managers engage diverse stakeholders to co-create, maintain and sustain research processes and outputs that they can equitably benefit from.



Dr Emma Karoune
Senior Research Community Manager, Health I Tools, Practices and Systems



Dr Arron Lacey
Senior Community Manager, EDOⁿ



Dr Cassandra Gould Van Praag
Senior Research Community Manager at the Turing Research and Innovation Cluster in Digital Twins (TRI...)



Dr Gabin Kayumbi
Senior Research Community Manager, Data Centric Engineering (DCE) I Tools, Practices and Systems



Anne Lee Steele
Research Community Manager, The Turing Way I Tools, Practices and Systems



Vicky Hellon
Research Community Manager, Turing-Roche Partnership I Tools, Practices and Systems



Dr Eirini Zormpa
Research Community Manager, AIM RSF Open Collaboration I Tools, Practices and Systems



Dr Sarah Gibson
Researcher, The Turing Way



Claudia Fischer
Research Assistant, Data Justice and Global Ethical Futures

[Open Research Community Management webpage](#)

Funding and support towards non-traditional skills and roles

The Turing Way Practitioners Hub:

working with experts from government, industry, public sector and research to enable cross-sector exchange.

- Pilot ending in December 2023
- Scope to **extend this internationally**



The Turing's Skill Policy Award (led by Emma Karoune): Co-producing skills frameworks to strengthen recognition for emergent roles.

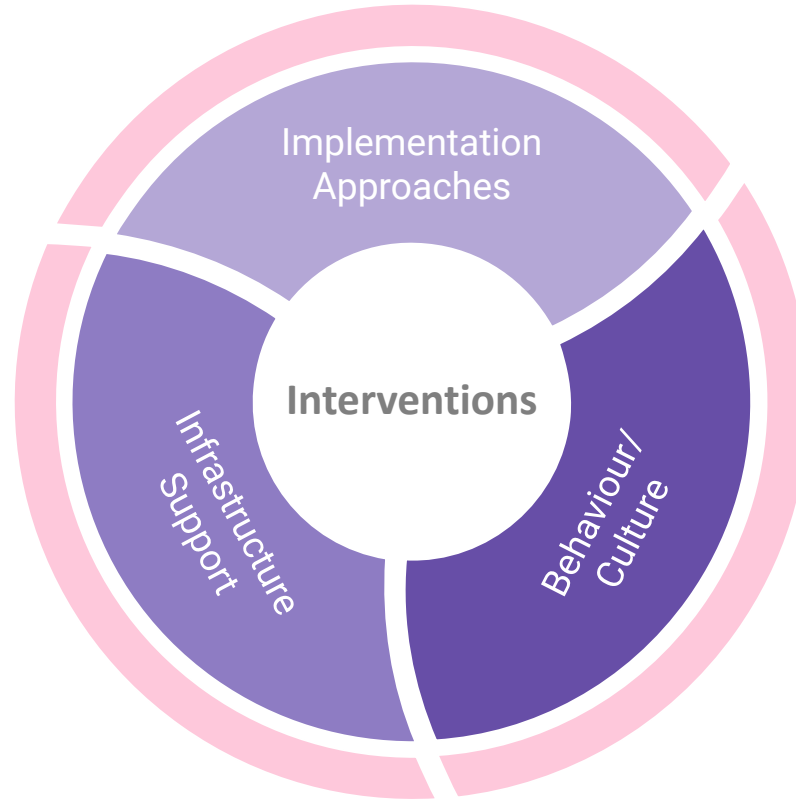
- Funded till March 2024
- Next phase to **engage with policy ecosystem**



Emma Karoune

Senior Research
Community
Manager

“Do No Harm” (Simple) Framework



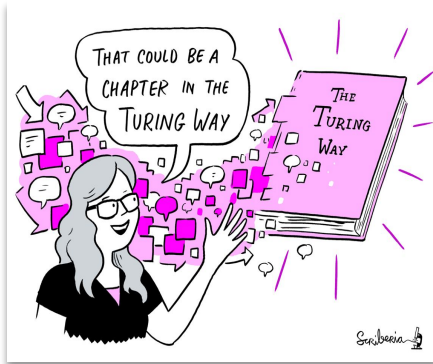
2. Functioning of communities and relation between actors

Governance/decision-making, participation and recognition for all kinds of contributions

The Turing Way

A community-led handbook to best practices in Data Science.

*We involve and support a **diverse community** to make research **reproducible, ethical, and collaborative** for everyone.*



Book



Community



Global Collaboration

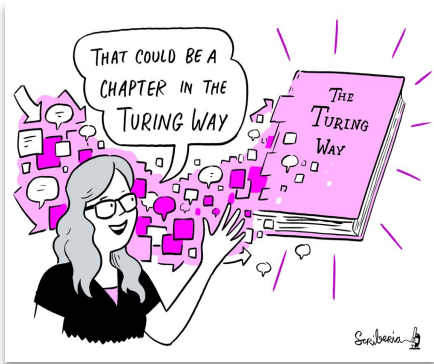


Culture Change


The Turing Way

A community-led handbook to best practices in Data Science.

We involve and support
reproducible, ethical



Book



The Turing Way

Community

Different Pathways

Early Career Researchers

- [Guide for Project Design](#)
- [Getting Started With GitHub](#)
- [Creating Project Repositories](#)

And more...

Project Leaders

- [Open Leadership in Data Science](#)
- [Guide for Project Design](#)
- [Creating Project Repositories](#)

And more...

Research Software Engineers

- [Citing Research Objects](#)
- [Research Software Engineer: Overview](#)
- [Research Software Engineering Personal Story](#)

And more...

Software Citation

- [Making Research Objects Citable](#)
- [Steps for Making Research Objects Citable](#)
- [Citing Research Objects](#)

And more...

Global Collaboration

Culture Change

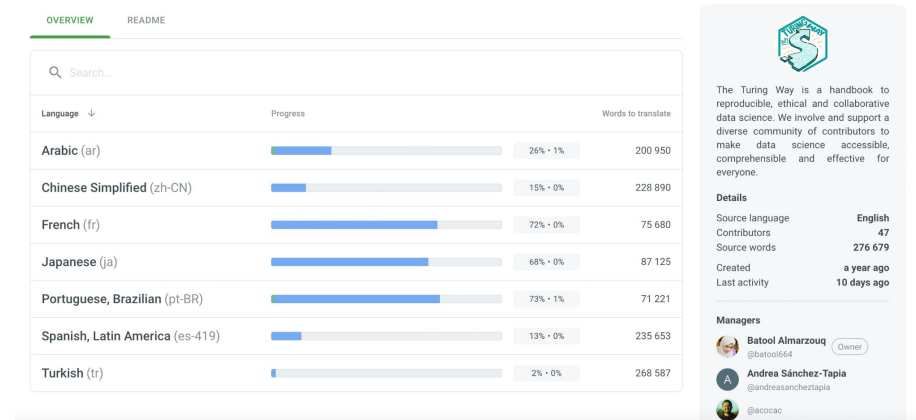
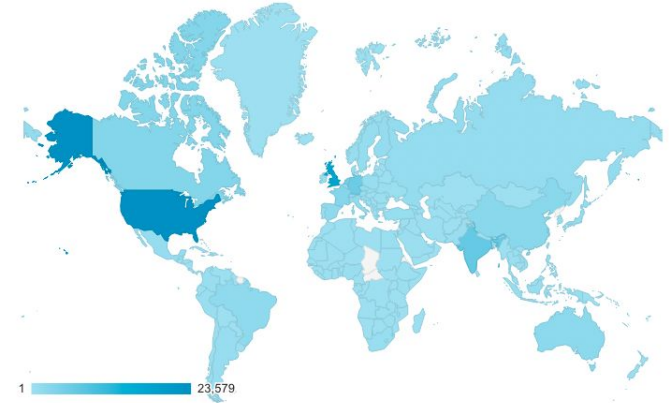
Belongs to the community

This is always a **work in progress** - evolving with the needs in the community.

As a **knowledge commons**, accessed worldwide and involves community in its development and direction setting.

Community members leading on **localisation and internationalisation** of best practices.

Convening/facilitating **critical conversations**.



Resources:

Image 1: The Turing Way book visitors as of Dec' 22,

Image 2: Localisation and translation of resources in multiple languages



Prioritising Collaboration and Maintenance

Slow, iterative, hidden, unglamorous are not necessarily novel BUT are inclusive, intentional, catalyse culture change, lead to innovation and successful in the long term.

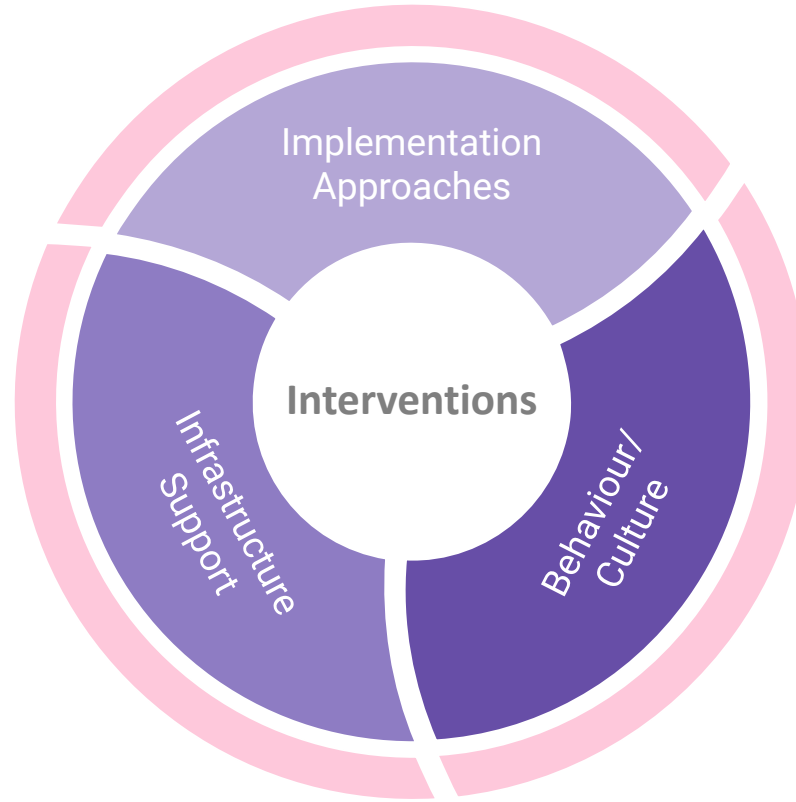
Care infrastructure such as maintenance, community support, translation and localisation remain a highly underfunded yet are crucial for addressing biggest barriers to knowledge equity.



**Information
Maintenance
as a
Practice
of
Care**

**an Invitation
to
Reflect
and
Share**

“Do No Harm” (Simple) Framework



3. Local Economy

Achieving both scientific and economic equity through progress in scientific practices.

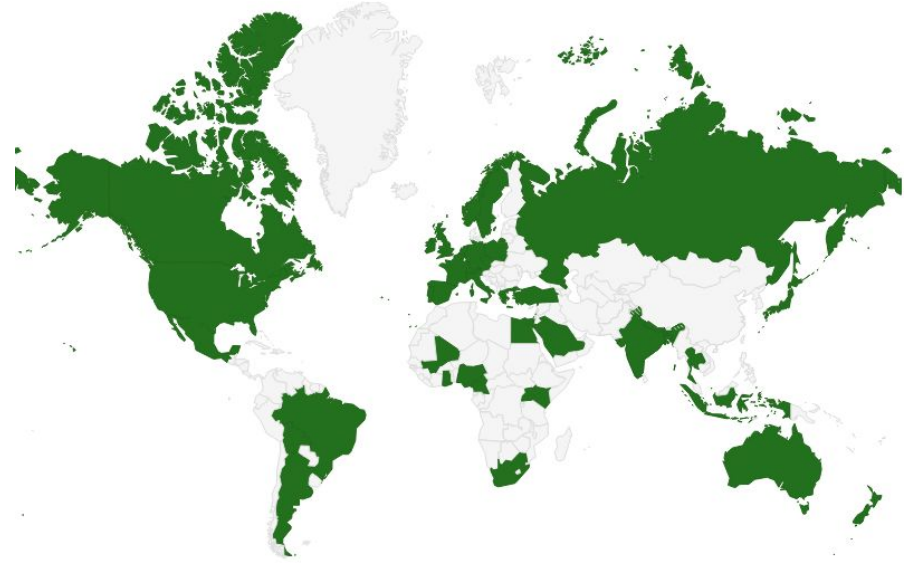


The **OLS** (formerly Open Life Science) is an open science capacity building organisation.



We are well known for our 16-week long project-based mentoring and training programme, Open Seeds.

7 Cohorts, 237 projects.
Fellowship for leadership development.



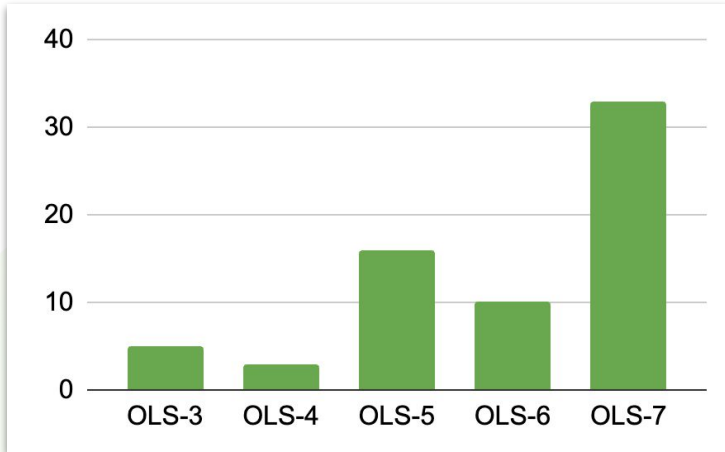
500+ members leading
infrastructure and communities





Microgrants for accessibility

Number of grants to date: 70



Smallest microgrant: 7 USD

Largest microgrant: 1270 USD

Mean microgrant size: 175 USD

~25,000 offered to volunteers each cohort



Yo Yehudi,
Executive Director

Strengthening Policies for
Widening Participation in Data
Science

Turing's Skills Policy Awards, Led
by **Yo Yehudi**

Funding and support towards knowledge equity

Level playing field for researchers and organisations from LMIC in navigating the research funding landscape



Challenges:

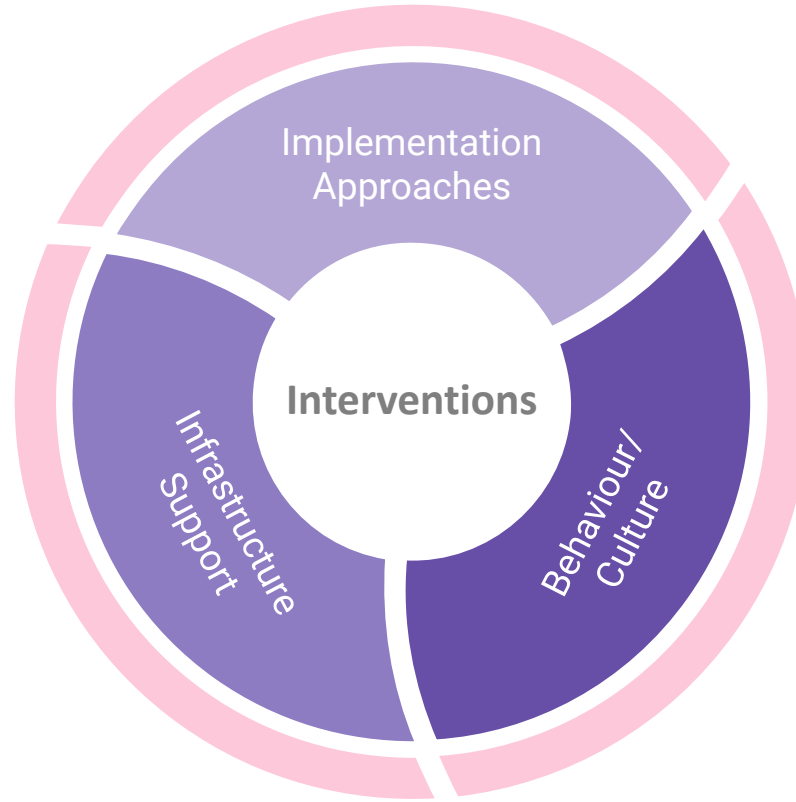
- Funders do not receive many proposals from LMIC
- when applications are received from these regions, they are not seen as competitive enough as per the funders' requirements

Solutions we are trying to develop

- Cohort-based training approaches
- 1:1 mentoring and coaching
- Research-based collaborative guide and resources for South-South, and North-South collaboration

bit.ly/2023-ols-lmic-curriculum, GitHub: <https://github.com/open-life-science/knowhow/pull/1>

“Do No Harm” (Simple) Framework



4. Environment & contexts

Researchers' context where they conduct their work, as well as broader environmental impact.

Challenges

Advance data science and AI to address challenges...



Context and Environmental Impact of Research Software Communities

- Data protection and 'as open as possible and as closed as necessary'
- FAIR alongside CARE principles
- Contextual knowledge through “big team science”, multilingual and cross-regional models and practices
- **Actively “measure, optimise and reduce” carbon emissions**



Carroll S. R., Hudson, M., Holbrook, J., Materechera, S., Anderson, J. (2020) Working with the CARE principles: operationalising Indigenous data governance. <https://www.adalovelaceinstitute.org/blog/care-principles-operationalising-indigenous-data-governance>
FAIR Principles - GO FAIR. (2022). <https://www.go-fair.org/fair-principles>

Collaboration and support towards Environmental Sustainability

[WIP] The Environmental Impact of Digital Research #3117

Open c-martinez wants to merge 17 commits into the-turing-way:main from c-martinez:env-impact-of-open-rese

Conversation 39 Commits 17 Checks 8 Files changed 7

c-martinez commented on May 24 · edited Collab

Summary

Addressess #2803

List of changes proposed in this PR (pull-request)

- Incorporates [initial draft of the chapter](#)

What should a reviewer concentrate their feedback on?

- Is this the right place for the chapter?
- Images should be improved
- TBC sections should be completed
- @acocac and @annefou wanted to contribute a section on environmental impact of data
- Everything looks ok?



Open Source in Environmental Sustainability

Search the docs ...

INTRODUCTION

- Prelude
- Objectives
- Methodology
- Principles

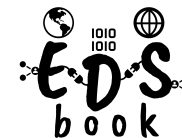
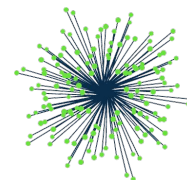
INSIGHTS

- Overview
- Topics
- Popularity
- Age

Localisation and Decentralisation

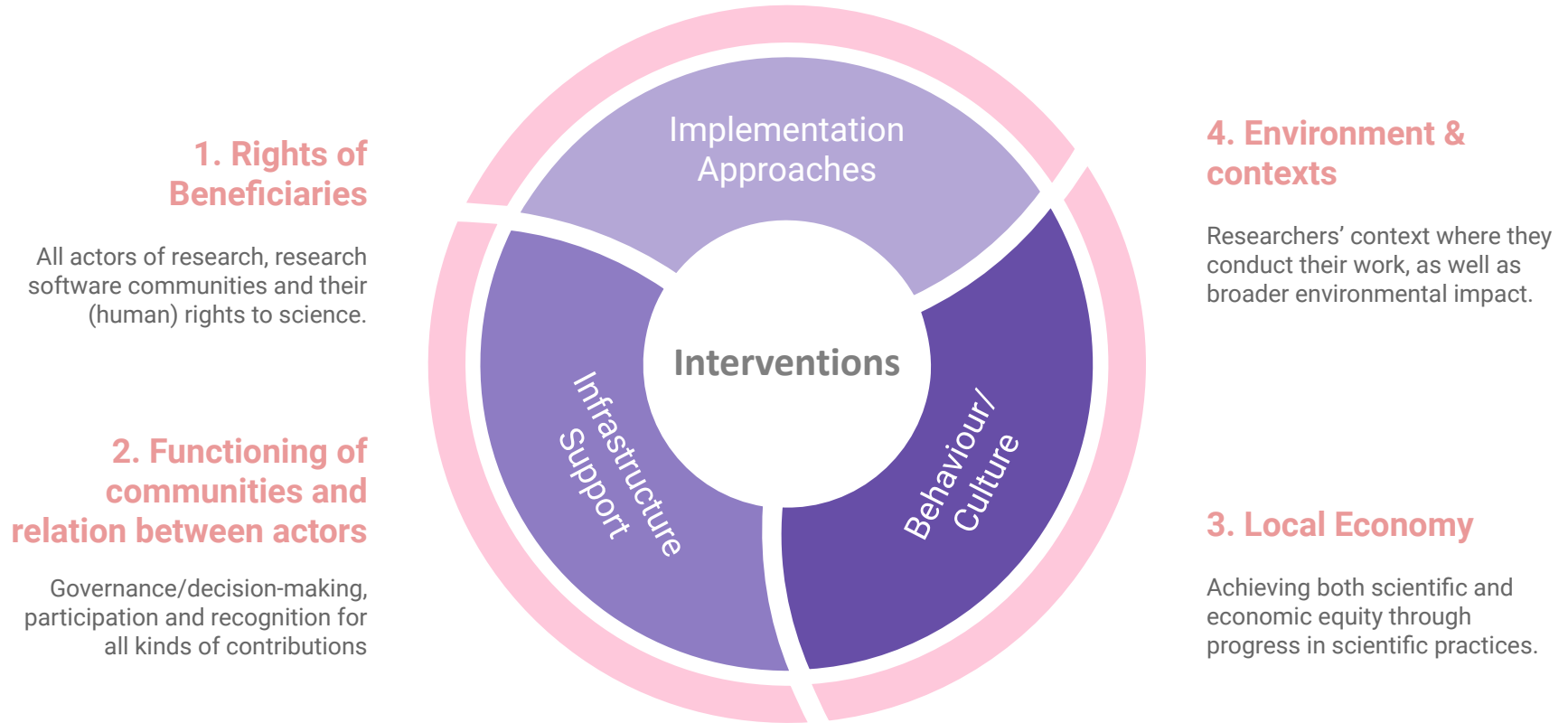
Wealthier economies with greater technological capacity can adapt more quickly to climate change by openly licensing participation and collaboration contribute significantly to the global sustainable development. In addition, by sharing information resourced communities can rapidly build local interdisciplinary and sustainability transformations. This is especially important mobility, food, and housing. For example, [open agriculture](#) can the environmental impact of their farming techniques. Practice change that is responsive to local conditions and cultural needs

Countries must also be supported to rapidly deploy and meet their infrastructure needs. This has the potential to enhance job growth, and drive resource and efficiency gains. For example as [NASA Harvest](#) use measurements and forecasts to improve worldwide. By open-sourcing the data, models, and software insights are easily accessible, adaptable, and actionable within building resilience, social equality, and strengthening local external proprietary options, may not be appropriate at the other hand, can lay a digital foundation based on solutions



The Turing Way Pull Request - GitHub: <https://github.com/the-turing-way/the-turing-way/pull/3117>, Augspurger, T., Malliaraki, E., & Hopkins, J. (2023). Open Source in Environmental Sustainability. Zenodo. doi: 10.5281/zenodo.7771633, <https://report.opensustain.tech/>, Open Environmental Data: <https://www.openenvironmentaldata.org/about>, Env Data Science Book: <https://edsbook.org>

“Do No Harm” (Simple) Framework



Negative Effects can be explained under Four Categories

Community and capacity building should focus on bridging the scientific and economic divide by sharing benefits.

A community-oriented framework can extend the benefits of research to the broader community, where funders can lead the way by setting the right *incentives* in place that *do no harm*.

Acknowledgements:

- Kirstie Whitaker, TPS Programme Director, TPS Team Members
- Anne Lee Steele, Alexandra Araujo Alvarez, Arielle Bennett
- *The Turing Way* Team Community, Collaborators & Contributors

- Yo Yehudi, Bérénice Batut, Emmy Tsang
- Paz Bernaldo, Taj Gwadabe, Patricia Herterich, Mayya Sundukova, Flavio Azevedo, Bethan Iley, Debs Udoh
- OLS fellows, community and collaborators

Links:

- The Turing Way links: <https://the-turing-way.start.page/>
- OLS links: <https://openlifesci.org/>
- Original artwork by Scriberia: <https://doi.org/10.5281/zenodo.3332807>

