

Investing in Research Infrastructure Roles for Culture Change

Malvika Sharan, Pronouns: She/her

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The Alan Turing Institute

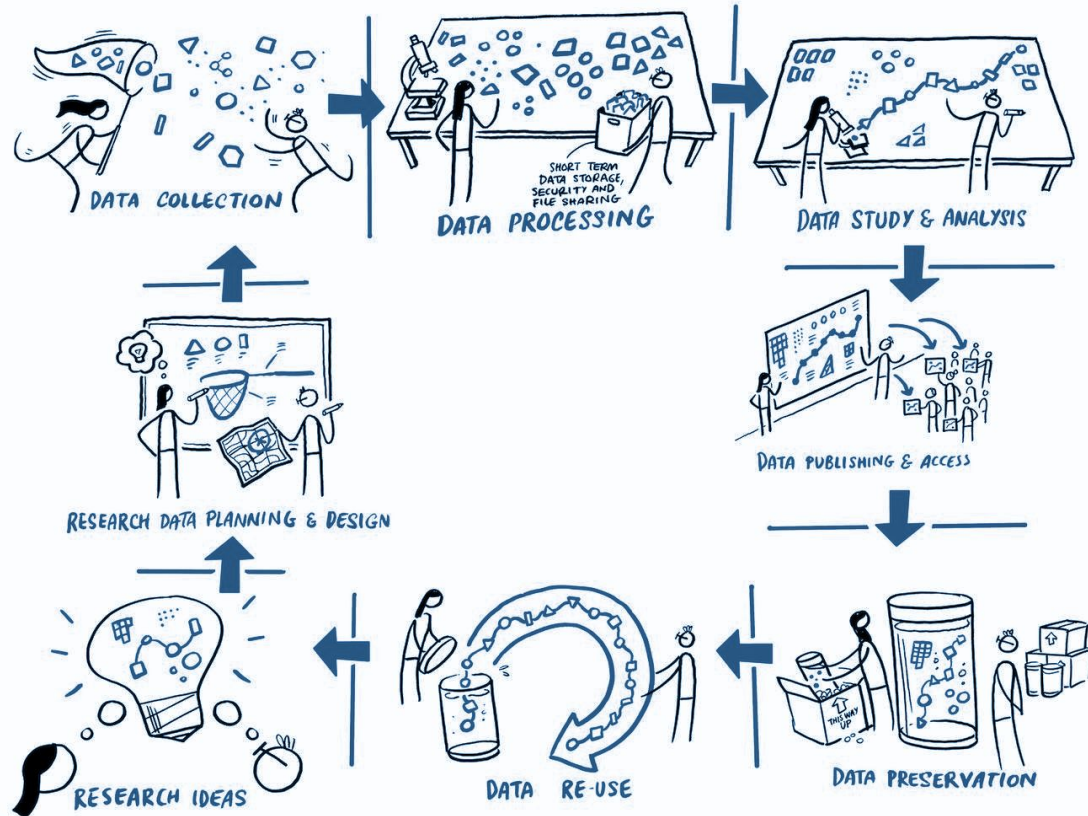
Investing in Research Infrastructure
Roles for Culture Change

Malvika Sharan

Senior Researcher - Open Research
Tools, Practices and Systems Programme

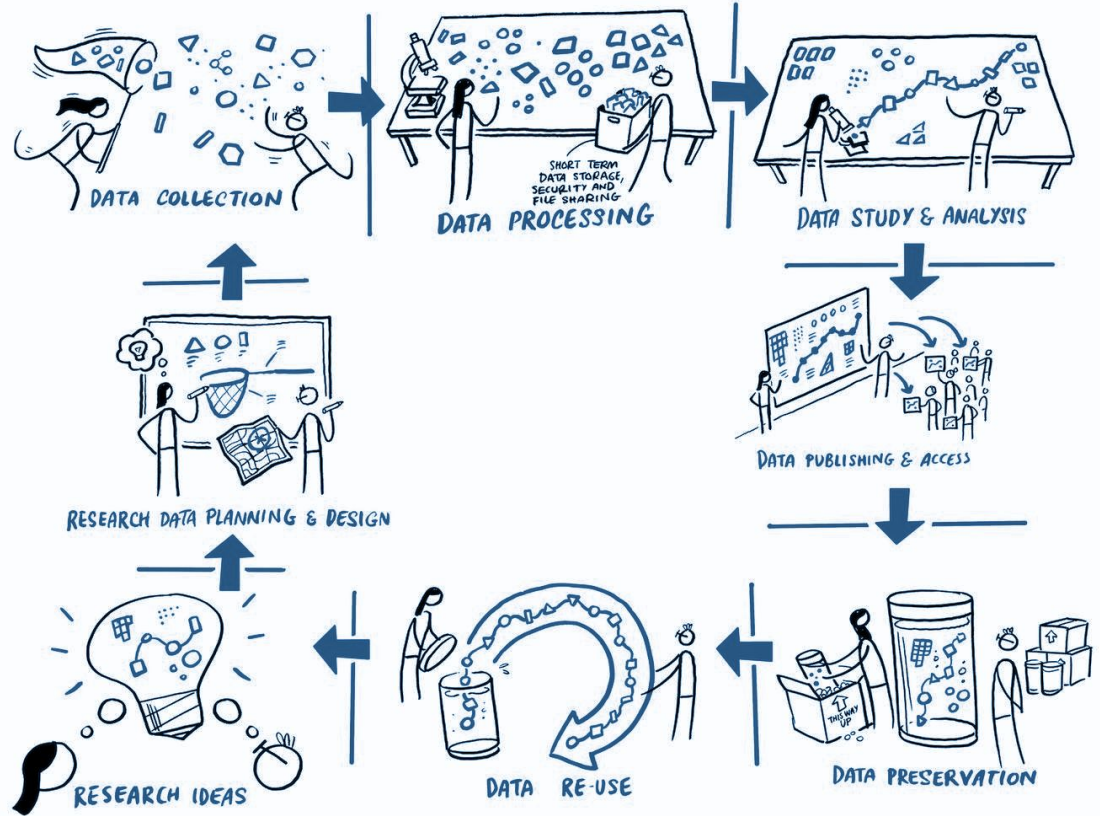


Research Life Cycle



Research Life Cycle

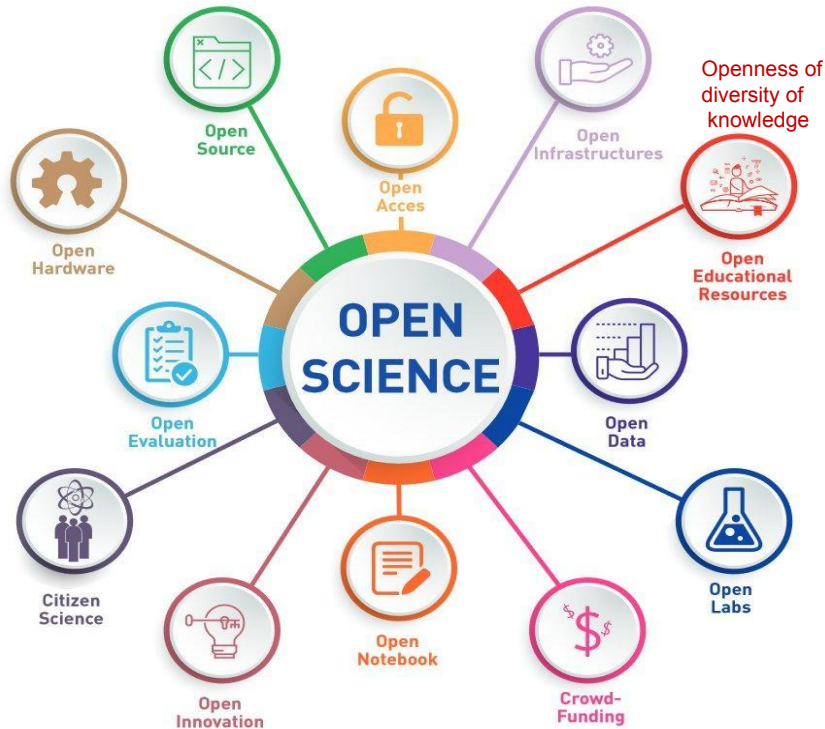
- Researcher(s)
- Project supervisor
- Data Scientist
- Research Engineer
- Peer reviewers
- Data manager
- Project manager
- ...



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Integrating Open Science and Reproducibility



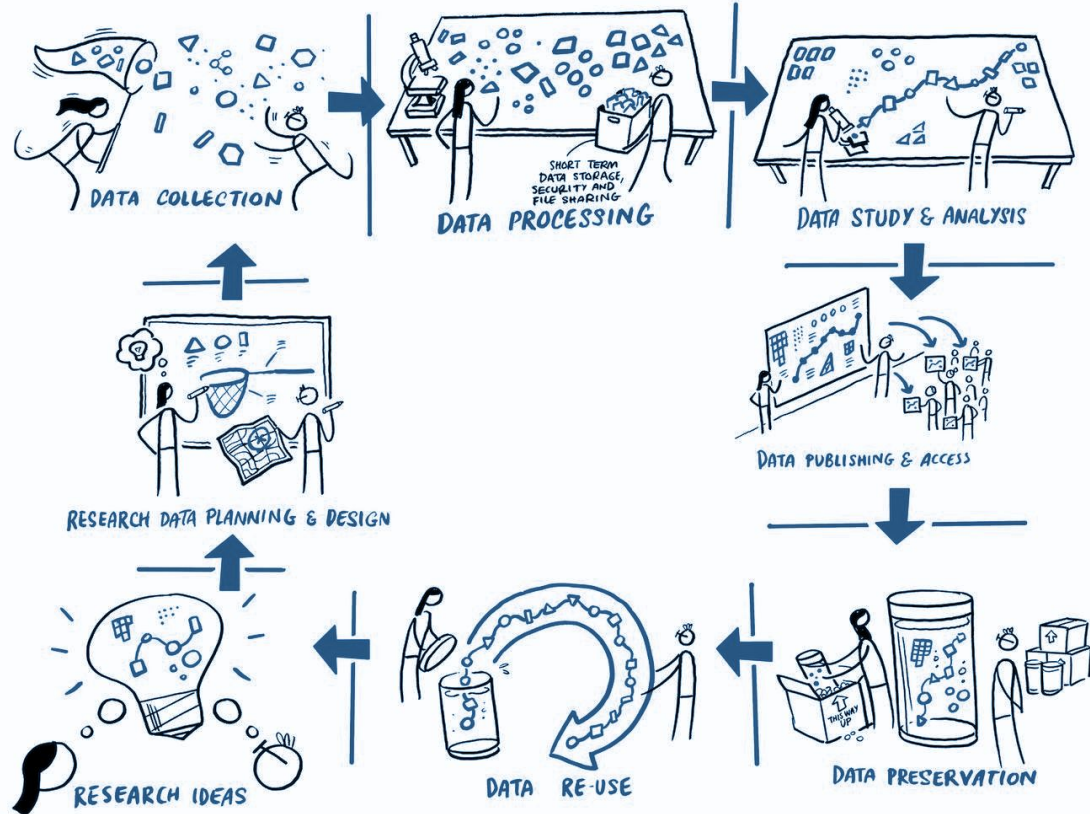
		Data	
		Same	Different
Analysis	Same	Reproducible	Replicable
	Different	Robust	Generalisable

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

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Research Life Cycle

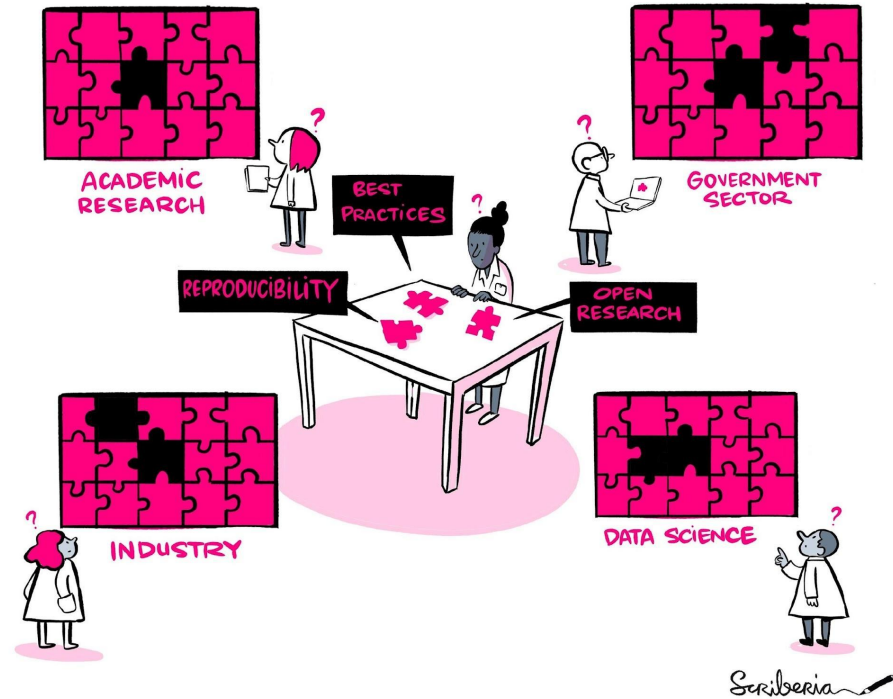
		Data	
		Same	Different
Analysis	Same	Reproducible	Replicable
	Different	Robust	Generalisable



Evolving Research and data Landscape

Data skills range from programming, data visualisation, analysis and database management, to core skills such as problem solving, project management and communication.

National Data Strategy, 2020



National Data Strategy - 2020. Gov.uk. Department for Digital, Culture, Media and Sport. [Skills: Data skills for a data-driven economy and data-rich lives](#)

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Emergent Research Roles

- Project scoping
- Funding
- Project management
- Project supervision
- Reporting / publication
- Data & Digital Skills
- Peer review
- Research engineering
- Data management
- ...
- Stakeholder engagement
- Collaborative workflow
- Impact assessment
- Policy compliance
- Ethical considerations
- Adoption of outputs
- Govt./Public feedback
- Sharing 'Research Objects'
- Archiving and preservation
- ...
- Equitable & inclusive teams
- Maintenance
- Training and upskilling
- Community management
- Event facilitation
- Mentoring & career support
- Documentation
- UX/UI development
- Software auditing
- ...

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

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Emergent Research Roles

(Open) Research skills should be **incentivised fairly**

- Project scoping
- Funding
- Project management
- Project supervision
- Reporting / publication
- Data & Digital Skills
- Peer review
- Research engineering
- Data management
- ...
- Stakeholder engagement
- Collaborative workflow
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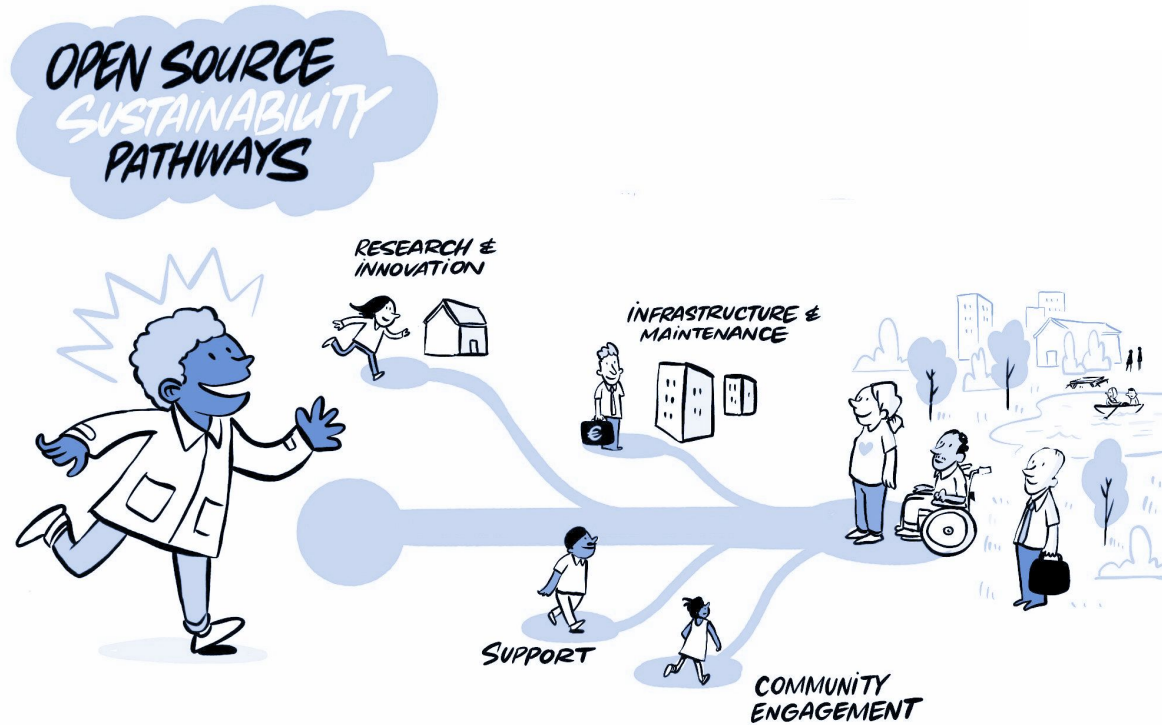
Contributors Roles taxonomy: CRediT, credit.niso.org.

Careers in Research - London School of Economics:

<https://info.lse.ac.uk/current-students/careers/>

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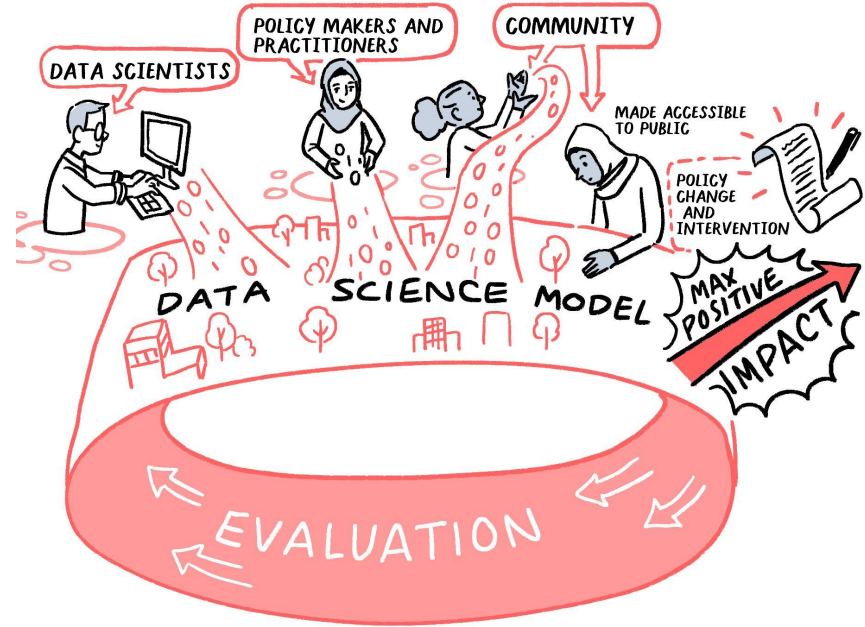
Research Infrastructure Roles



UK Research and Development Roadmap: Attract, retain and develop the talented, diverse people and teams. Ensure that our science, research and innovation system is responsive to our society

Research Infrastructure Roles

Research infrastructure roles provide **specialised skills, expertise and services** required for effectively carrying out **high-quality research**.

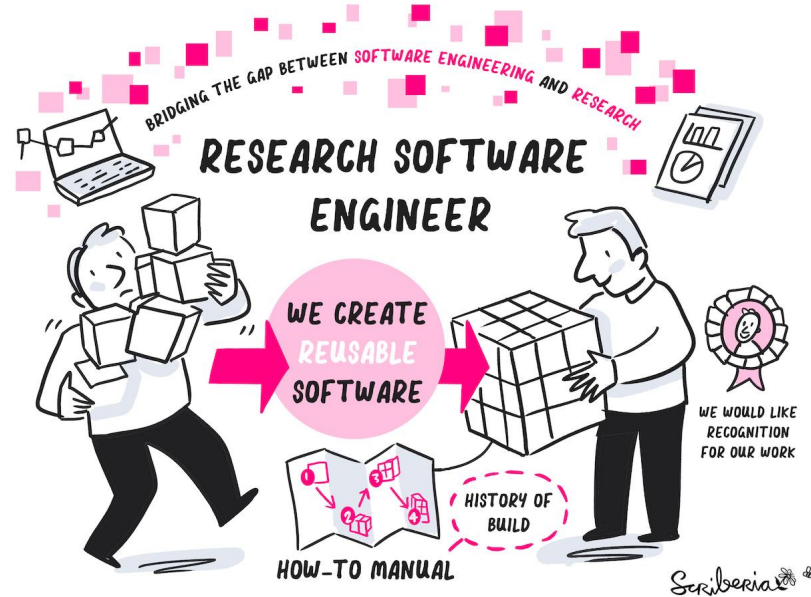


UK Research and Development Roadmap: Attract, retain and develop the talented, diverse people and teams. Ensure that our science, research and innovation system is responsive to our society

Diversifying Research Roles



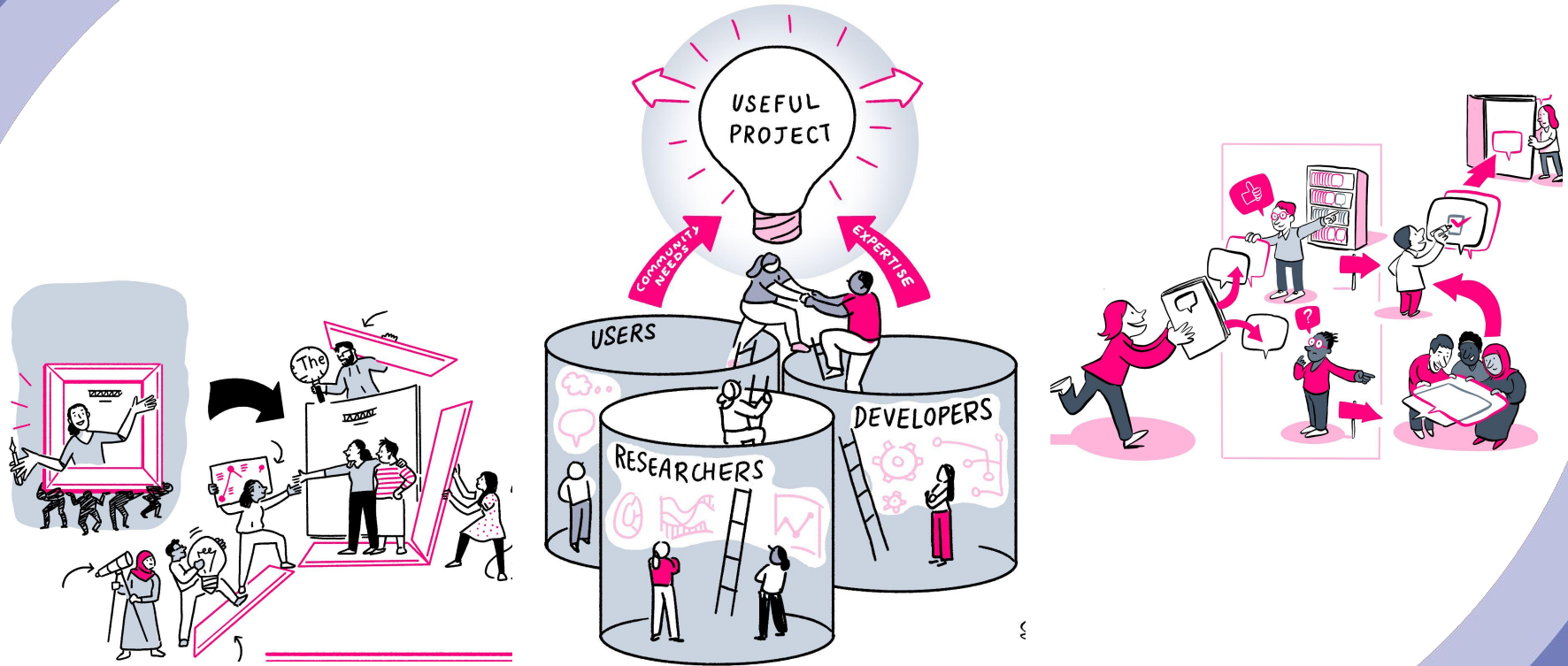
10 Years of the RSE movement



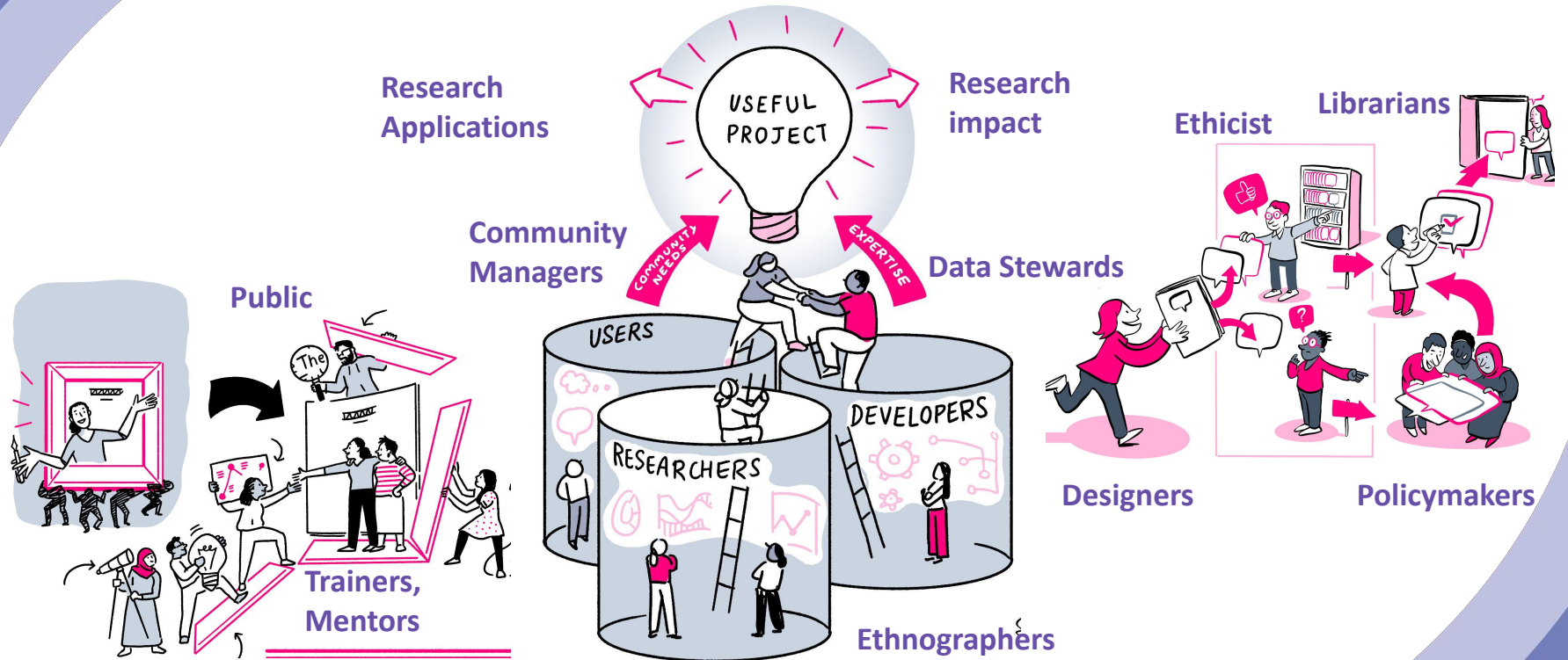
Baxter, R, Chue Hong, N, Gorissen, D,
Hetherington, J & Todorov, I 2012, 'The Research
Software Engineer', Digital Research 2012

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Diversifying Research Roles



Diversifying Research Roles



The Alan Turing Institute

The national institute
for data science and
artificial intelligence



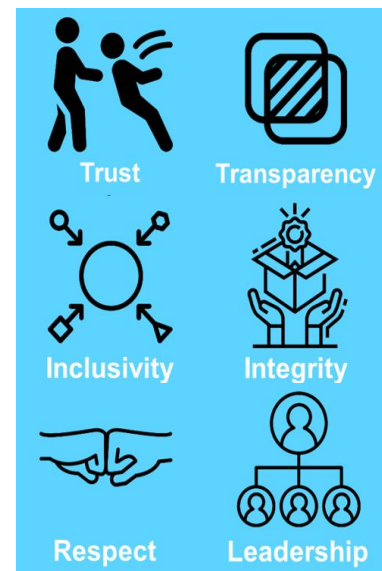
Tools, Practices and Systems

- Trustworthy systems
- Transparent reporting
- Inclusive interoperable design
- Ethical integrity
- Respectful co-creation
- Leadership in open research



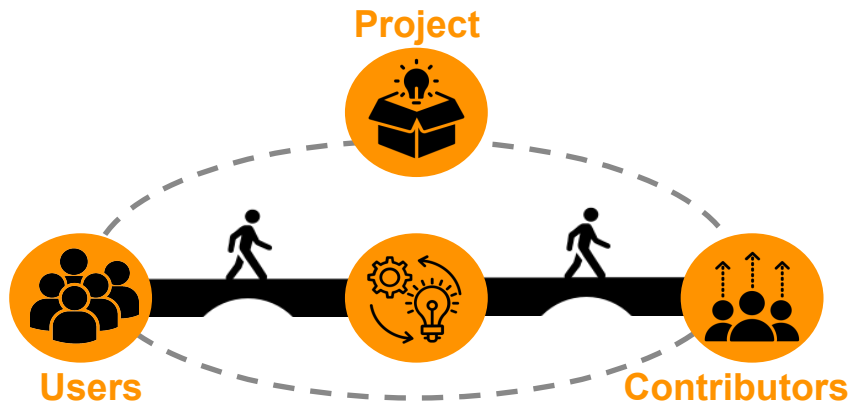
Kirstie Whitaker

Director of the programme



Tools, practices and systems

Building open source infrastructure to empower a global, decentralised network of people who connect data with domain experts

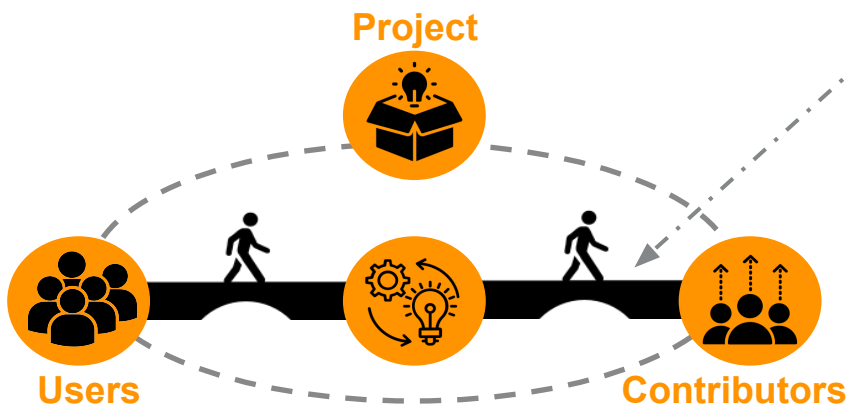
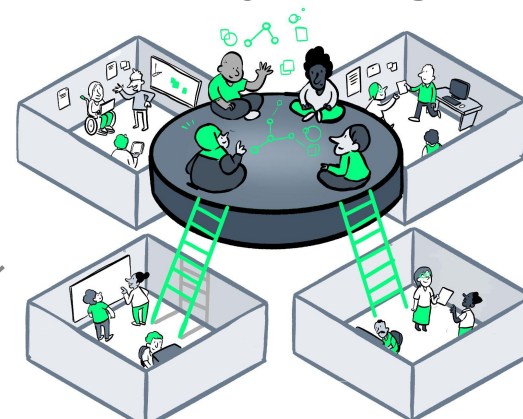


Strategic and technical support for Stakeholder
Engagement and Participation

Tools, practices and systems

Building open source infrastructure to empower a global, decentralised network of people who connect data with domain experts

Community Management



Strategic and technical support for Stakeholder Engagement and Participation

Researchers and collaborators



Dr Emma Karoune



Dr Arron Lacey



Anne Lee Steele



Vicky Hellon



Dr Eirini Zormpa



Claudia Fischer



Ayesha Magill

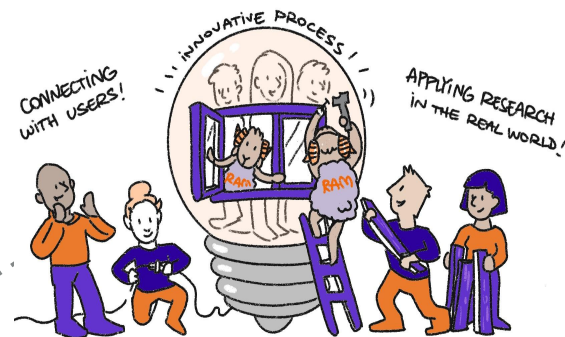


Bridget Nea

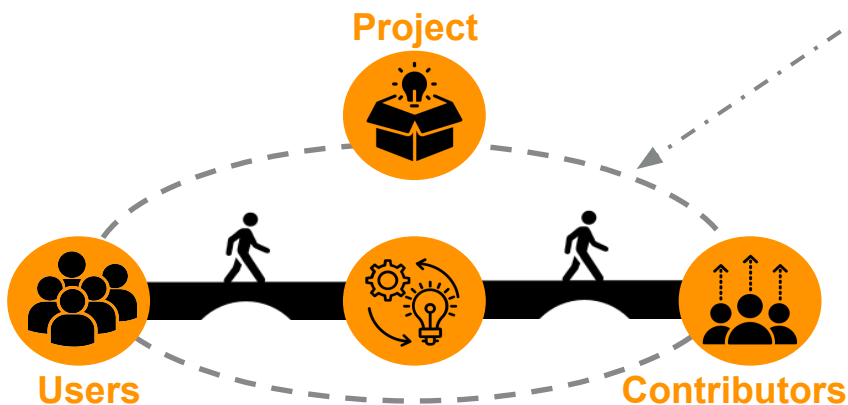
Tools, practices and systems

Building open source infrastructure to empower a global, decentralised network of people who connect data with domain experts

Research Applications



Senberia



Strategic and technical support for Stakeholder Engagement and Participation

Organisers



Dr Aida Mehonic



Dr Alden Conner



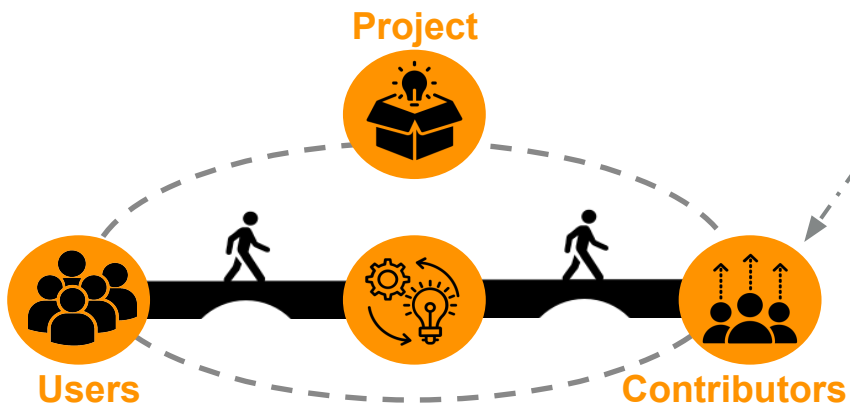
Jennifer Ding



Hari Sood

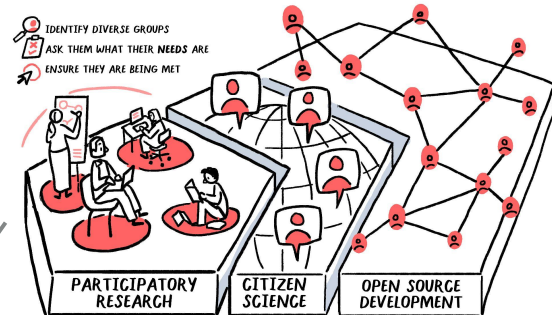
Tools, practices and systems

Building open source infrastructure to empower a global, decentralised network of people who connect data with domain experts



Strategic and technical support for Stakeholder Engagement and Participation

Participatory Citizen Science



Bastian Greshake-Tzovaras

Senior Researcher, Co-lead of Autspaces,
Co-director of Open Humans Platform,
Co-PI of Transbiome Project

**The
Alan Turing
Institute**

Partners and
collaborating
projects



**Tools,
Practices and
Systems**



Research
communities
at national &
global scale

Bidirectional flow of knowledge, resources & evidence

Research outputs

Strategic and
technical support

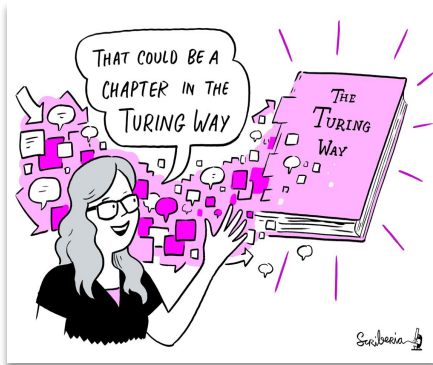
Open
Infrastructure



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: Book on Reproducibility

The Turing Way is a lightly opinionated guide to reproducible data science.

Our goal is to provide all the information that researchers need at the start of their projects to ensure that they are easy to reproduce at the end.

This also means making sure PhD students, postdocs, PIs, and funding teams know which parts of the "responsibility of reproducibility" they can affect, and what they should do to nudge data science to being more efficient, effective, and understandable.

		Data	
		Same	Different
Analysis	Same	Reproducible	Replicable
	Different	Robust	Generalisable



Guide for Reproducible Research

Overview

Open Research

Version Control

Licensing

Research Data Management

Reproducible Environments

BinderHub

Code quality

Code Testing

Code Reviewing Process

Reusable Code

Continuous Integration (CI)

Reproducible Research with

Make

Research Compendia

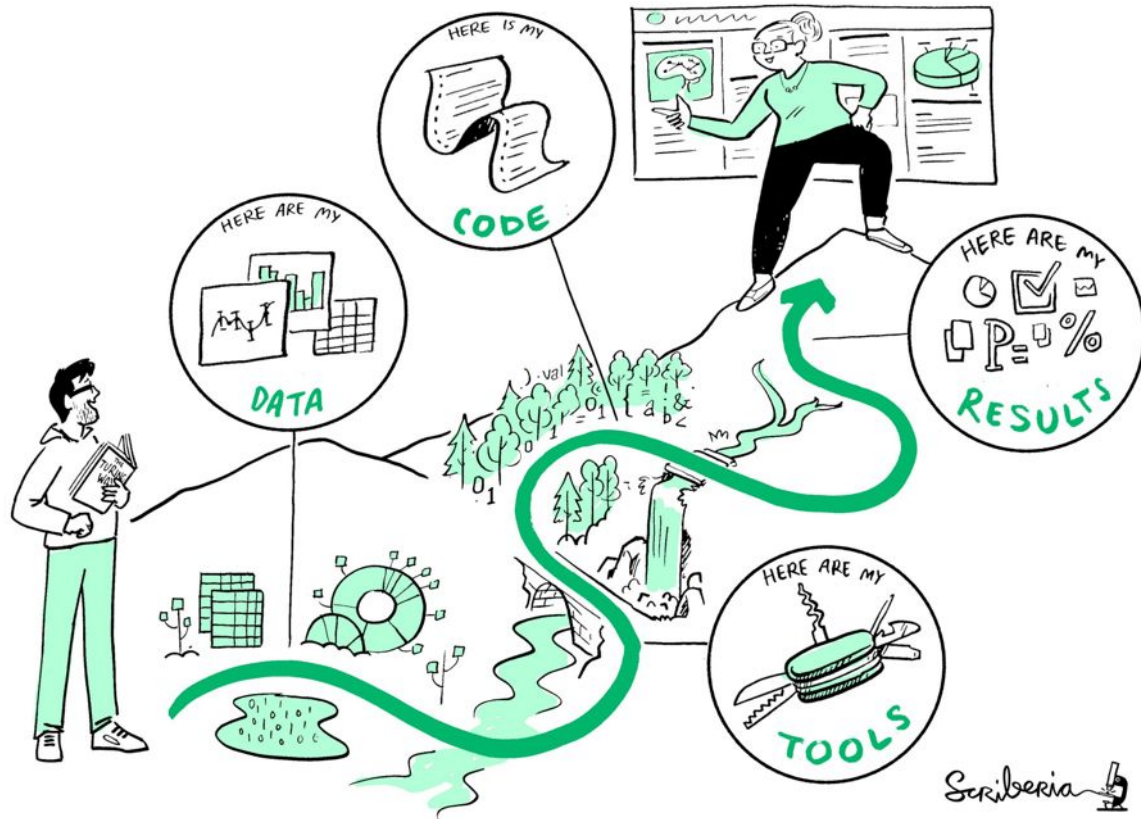


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The Turing Way

🔍 Search this book...

Welcome

Guide for Reproducible Research

Guide for Project Design

Guide for Communication

Guide for Collaboration

Guide for Ethical Research

Community Handbook



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Research Infrastructure Roles ^

Community Managers

Overview

Data Stewards Overview

Data Steward Personal Story

Data Wrangler Overview

Research Software Engineers
Overview

Research Software
Engineering Personal Story

Research Application
Manager Overview

Research Infrastructure
Developer Overview

Remote Collaboration v

Shared Ownership in Open
Source Projects v

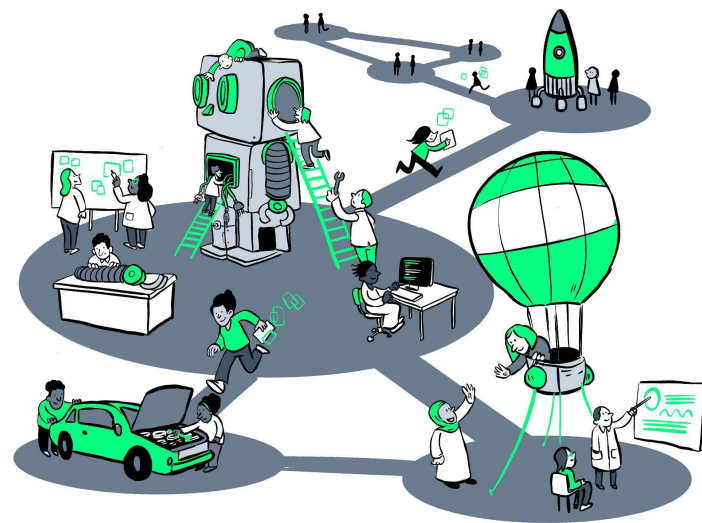
Guide for Ethical Research v

Community Handbook v

Examples of Research Infrastructure Roles

This initial list of examples of Research Infrastructure Roles that has been expanded as part of *The Turing Way* Hackathon Workshop at the [Big Team Science conference 2022](#).

- Community manager
- Project manager
- Research software engineer
- Research application manager
- Programme manager
- Data steward
- Data wrangler
- Research infrastructure developer
- Partnerships development manager
- Grant application manager
- Community engagement lead
- Librarian
- Communications manager
- Events manager
- Participatory research manager



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Project Growth & Recognitions

- 4+ years, >260 Chapters, community resources
- 425+ contributors, 3000+ monthly users - supported by project leads, community manager, 20+ core members (governance)
- Replication/extension by 3 Turing & 6+ external projects (e.g. ONS, UCL, Uni Oxford, LIBER: Association of European Research Libraries)

 19,098 views
16,710 downloads



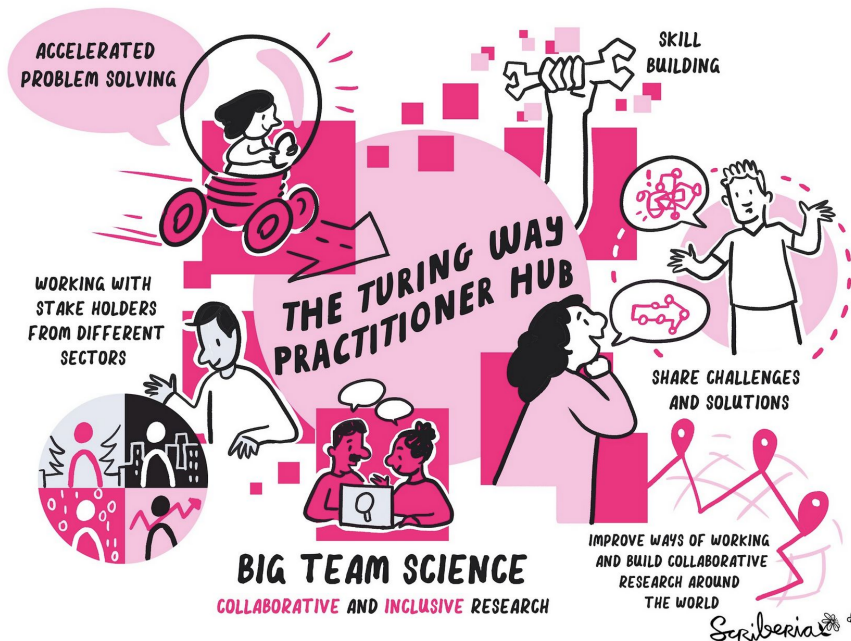
Notable Activities & Impact

Resources used by organisations, research teams, educators, community builders, policy makers and researchers globally

- **NASA - Transform to Open Science** - 5 years Mission for capacity building
- Recommended in **Goldacre Review for modern open working** into health data
- NASA OpenCore, CodeRefinery, Library Carpentries **training materials**
- Reproducibility of scientific results in the **EU 2020 report**
- **An Emerging Technology Charter** by Mayor of London (2021 policy)
- Innovation Scholars: **UKRI grant 2020** (funding call)
- Cited by 30+ peer-reviewed articles & 100+ online publications

Broader Recognition for Research Infrastructure Roles

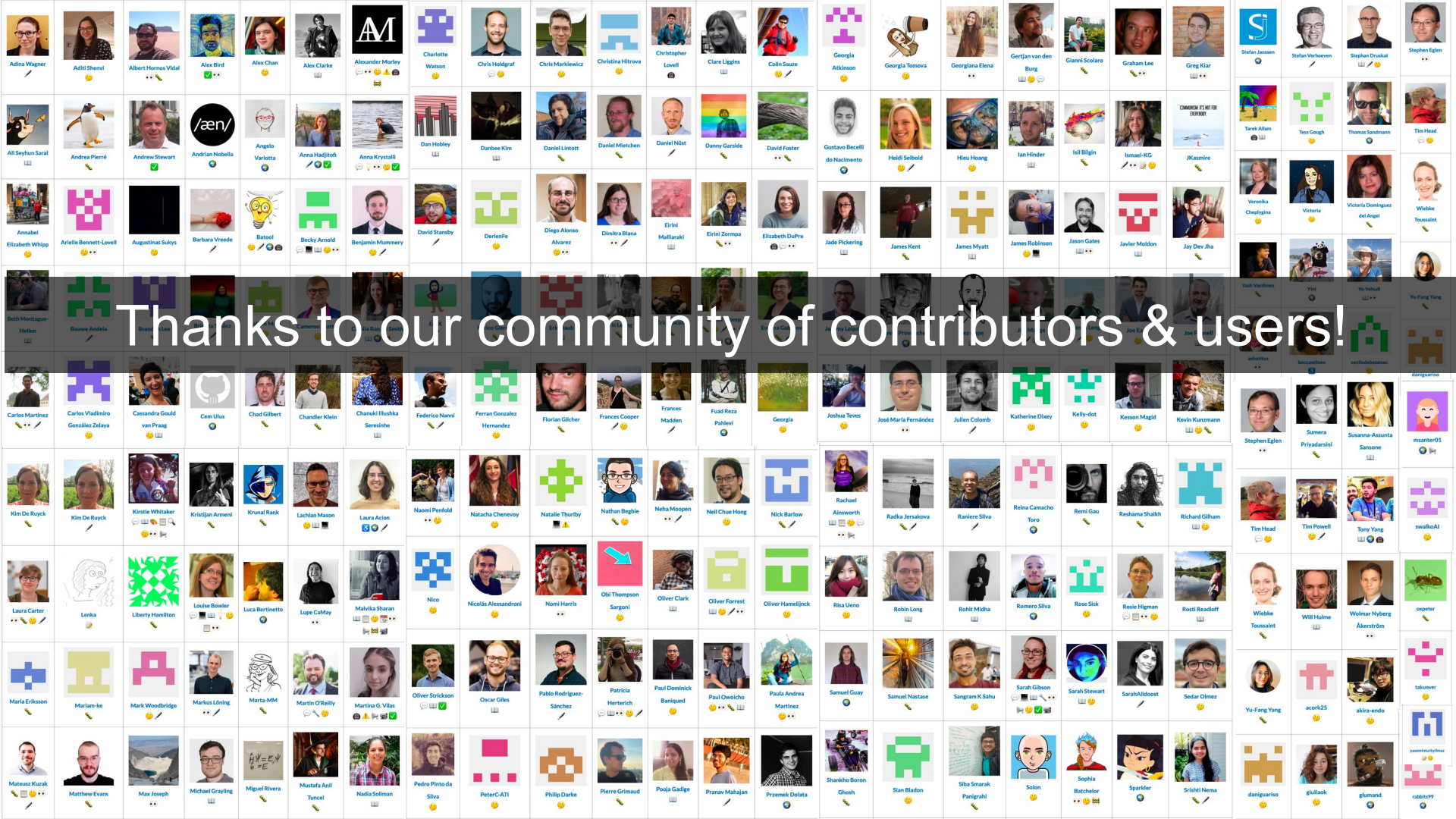
- **The Turing Way Practitioners Hub** in close collaboration with UK orgs (government, industry, public sector)
- **The Turing's Skill Policy Award** for engaging with policy ecosystem - led by **Dr. Emma Karoune**



21-22 March
QEII, London

The
Alan Turing
Institute

CATAPULT
Digital



Thanks to our community of contributors & users!

The Turing Way Community Handbook

Community Handbook

Code of Conduct

Ways to Enter the Project

Style Guide

Maintaining Consistency

Chapter Templates and

Contribution Workflow

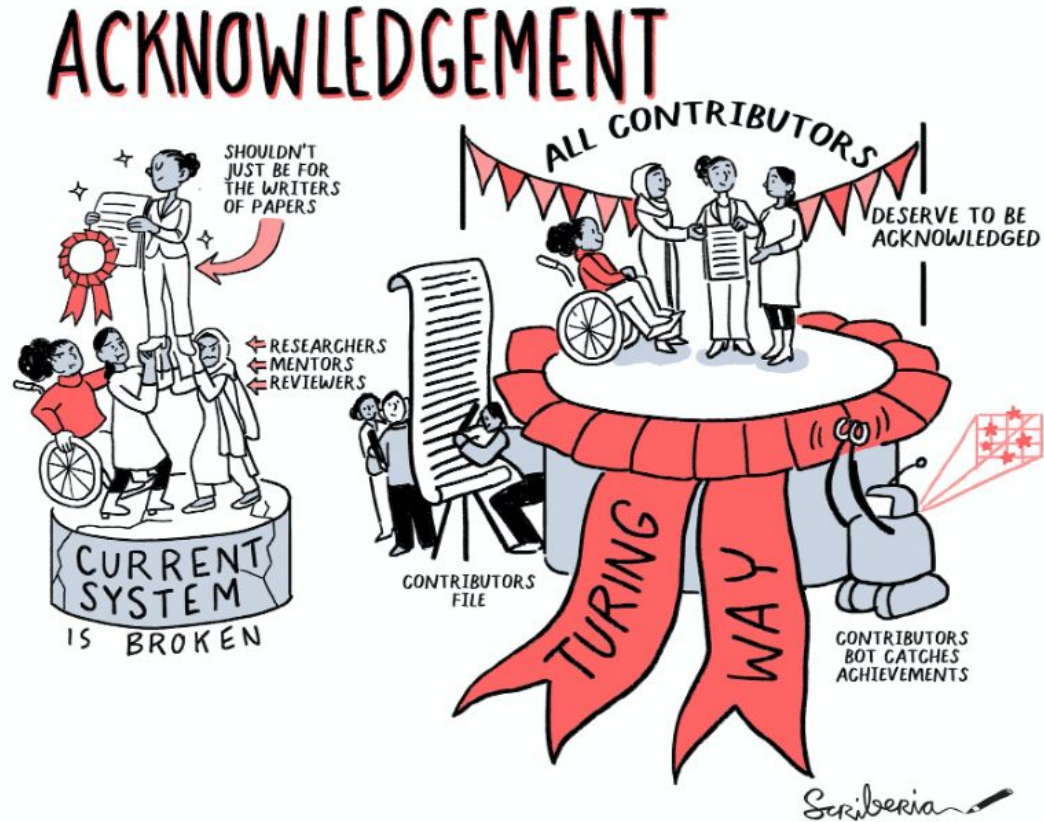
Acknowledging Contributors

Monthly Newsletters

Book Dash Events

Community Coworking Calls

Template Collection



Online book: <https://the-turing-way.netlify.app/community-handbook>, @malvikasharan @turingway

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The Turing Way



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Total Contributors:

all contributors 429

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All Contributors

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build passing localized 42% all contributors 54 netlify Success Stars 6.8k

This is a specification for recognizing contributors to an open-source project in a way that rewards every contribution, not just code.

Contributors

Thanks goes to these wonderful people (emoji key):

Online book: <https://the-turing-way.netlify.app/community-handbook>, @malvikasharan @turingway

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Join a Community Event

- *Collaboration Cafes*
 - 1st & 3rd Wednesdays (14:00 UTC)
- *Coworking Calls*
 - Mondays (10:00 UTC)
- *Book Dash, Fireside Chats*
 - Periodically
- *More ways to connect*

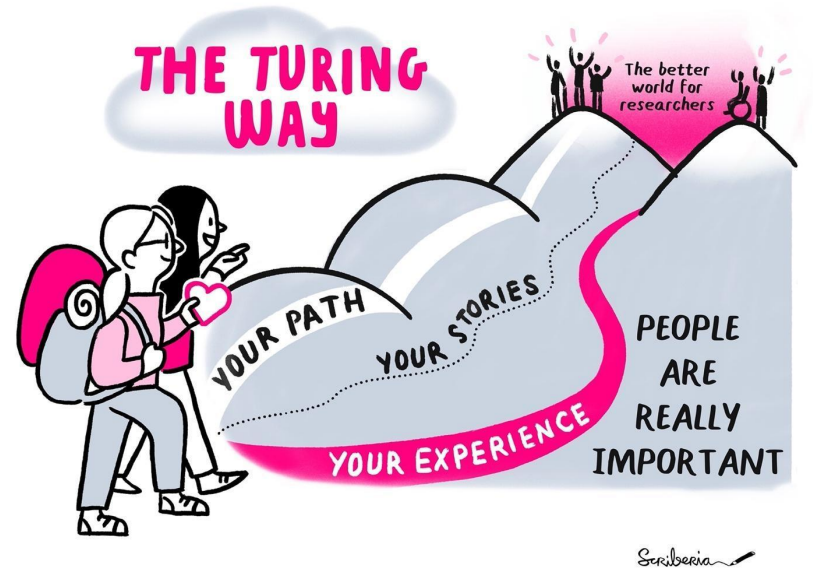
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Scriberia

Meeting you where you are!

- i. Join the community
- ii. Learn a new skill
- iii. Share your skills
- iv. Collaborate with others
- v. Mentor others' contributions
- vi. Represent this community



We value your participation!

The Turing Way Team at State of Open Con (3rd Floor)



Anne Lee Steele

Community Manager - The
Turing Way
The Alan Turing Institute

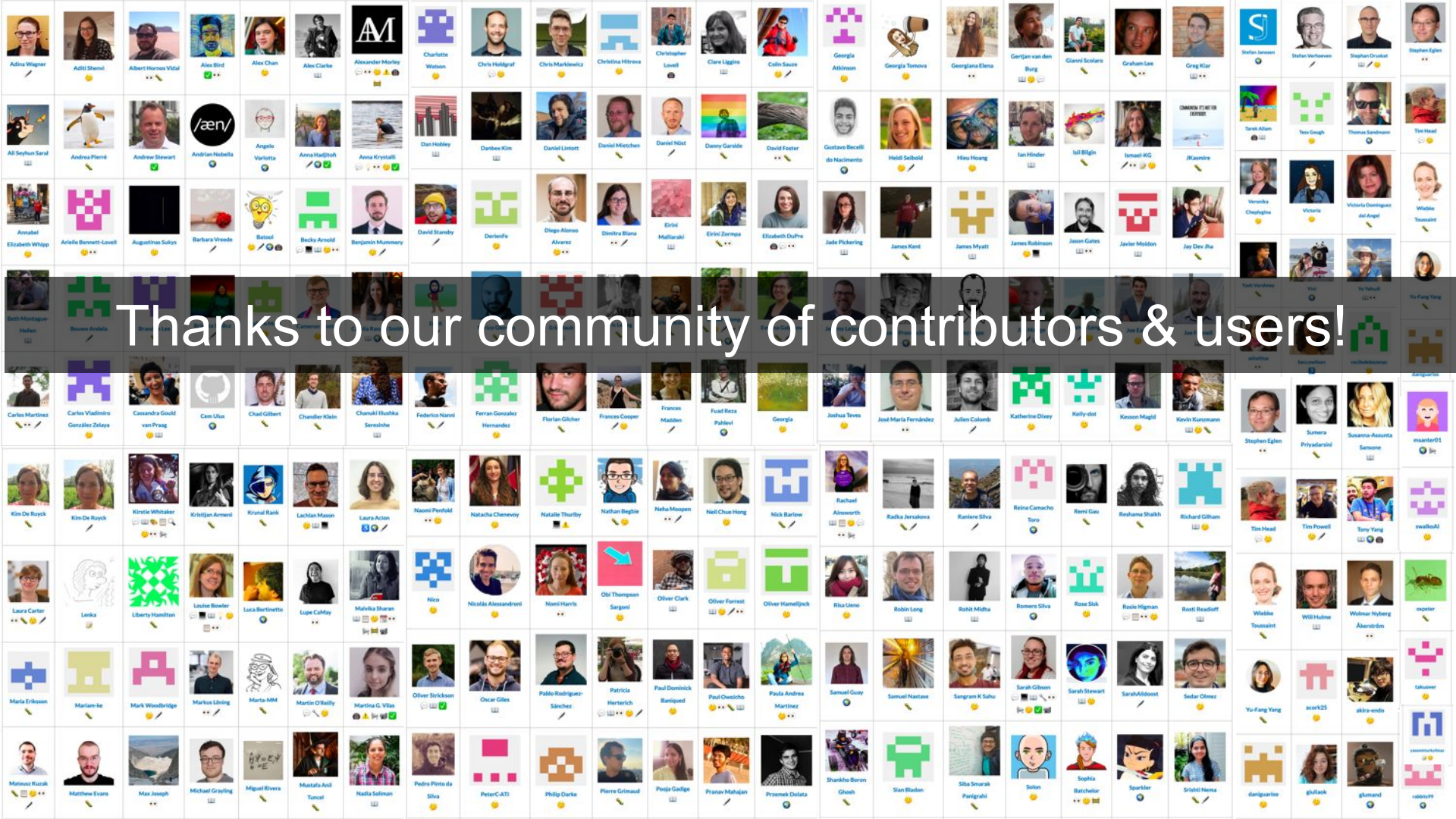


Emma Karoune

Senior Community Manager -
Health Programme
The Alan Turing Institute



bit.ly/turingway



Thanks to our community of contributors & users!

Acknowledgements:

- Kirstie Whitaker, TPS Programme Director, TPS Team Members
- *The Turing Way* Team, Anne Lee Steele - Community Manager
- *The Turing Way* Community, Collaborators & Contributors

Links:

- Book: the-turing-way.netlify.com
- Relevant resources: bit.ly/turingway
- Newsletter: tinyletter.com/TuringWay
- GitHub: github.com/alan-turing-institute/the-turing-way
- Original artwork by Scriberia: <https://doi.org/10.5281/zenodo.3332807>





Open Life Science

A mentoring & training program for Open Science Ambassadors in Life Science

Sharing

Connecting

Empowering

Join the program



1:1 mentoring



Training calls on Open Science

Talks from experts

Break out discussions



Training for mentors

OLS-8 applications open in June

Apply individually or in a team to join the cohort

 [openlifesci](https://twitter.com/openlifesci)

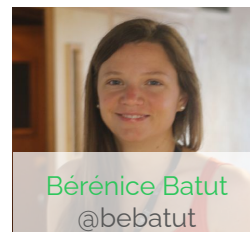
Visit our website: openlifesci.org



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National Aeronautics and
Space Administration



Dr. Chelle Gentemann, Science Lead
Yvonne Ivey, Equity Lead
Cyndi Hall, Community Coordinator
Isabella Martinez, Content Coordinator
Dr. Yaitza Luna-Cruz, CSDO Program Scientist
Dr. Paige Martin, TOPS Program Scientist
Dr. Sam Gabre, ARS, Science Advisor
Dr. Ryan McGranaghan, GSFC, Science Advisor

Kevin Murphy, Chief Science Data Officer SMD
Katie Baynes, Deputy Chief Science Data Officer SMD
Dr. Steve Crawford, Science Data Officer SMD
Amy (Uyen) Truong, Chief Science Data Office Coordinator



YEAR OF OPEN SCIENCE

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◆ DOE ◆ GSA ◆ NEH ◆ NIH ◆
◆ NIST ◆ USDA ◆ USGS ◆



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