

# The Turing Way Funded Proposal for The Turing Way Practitioner Hub (2022)

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## Section 1 - Aims

### 1.1 Activity title

*Extending the adoption of reproducible, ethical and collaborative practices in data science and AI*

### 1.2 Applicants

Malvika Sharan, Arielle Bennett

### 1.3 Programme Director

Kirstie Whitaker

### 1.4 Lead research programme or business team directorate

Tools, Practices & Systems

### 1.5 Other research programmes, business team directorates, universities, and/or other partners involved in delivery (*100 words max*)

The Turing' Partnerships and Skills directorates, and Impact Lead will play a significant role throughout delivery of proposed activities. During the scoping period, Partnerships will support TPS' engagement with existing collaborators such as Genomics England, ONS and the Energy Systems Catapult, and establish new partnerships. Building on TPS' already strong links with Public Policy and Skills teams, we will ensure alignment with initiatives like the DS & AI Educators programme, AI Standards Hub and Turing Commons.

Content, activities and timeline will be aligned with the Turing-wide BridgeAI bid to Innovate UK to scale the adoption of best practices across underserved sectors.

### 1.6 Activity start date

1/10/2022

### 1.7 Activity end date

31/12/2024

## 1.8 Would you be happy for this application to be considered for funding from alternative sources?

Yes

## Section 2 - Aims

### 2.1 Summary and goals of the activity (500 words max)

Please summarise the proposed activity and outline the goals (which should be Specific; Measurable; Achievable; Relevant; and Time-bound). Describe the problem the activity is trying to address, why it is a problem and who is impacted by the problem.

*“Expanding the capacity of [the TPS project] The Turing Way (TTW) to drive implementation of data science practices at UK institutions and industries through ‘TTW Practitioners hub’.”*

TTW is a series of guides on reproducibility, project-design, communication, collaboration, and ethical research, championing data-driven practices that enable reproducible, accessible and inclusive AI and data science. TTW is also a global community of volunteers who create, maintain and apply its resources in different contexts. As an open-source project, everyone can freely read, share, modify, and contribute back to the resources, accelerating their potential for innovation and impact. TTW has informed high-profile reports and policies and serves as a core influence on global initiatives led by organisations like NASA, ONS and Genomics England – Genomics Diverse Data Initiative (GDDI).

TTW is internationally recognised for influencing data science culture across government, funders, policy, and healthcare sectors. However, the project lacks capacity to capitalise on this influence crucial for strengthening Turing’s connections with these organisations.

This proposal sets out an ambitious plan for TTW to enhance impact and expertise in embedding best practices into organisations across the broader data science and AI ecosystem. Through BridgeAI collaboration, we also seek to adapt and extend the impact of TTW materials to sectors with lower data science and AI uptake. All our activities will be delivered in close alignment with Partnership, Skills and Public Policy teams.

The aim is to build a bi-directional channel between TTW and organisations that benefit from and contribute to the project. Through collaborations with national and international stakeholders TTW Practitioners Hub will promote quality and ethical integrity; accelerate the adoption of TTW approaches throughout the Turing and beyond; upskill and empower data science practitioners as best practice champions.

In addition, TTW and TPS will work with Partnerships and Skills to develop and begin delivery. This proposal will align its scope with BridgeAI, a proposal to Innovate UK that focuses on sectors where data science and AI skills are underdeveloped and utilised.

A TPS PDRA will be hired to conduct research, lead the engagement and coordinate the TTW Practitioners Hub effectively.

### **We propose a three-phase project:**

Phase 1: Scoping (October-2022 – March-2023)

- Develop TTW Practitioners Hub through partnership with external organisations already applying TTW -- Energy Systems Catapult, Genomics England - GDDI, GCHQ, The Crick Institute
- Conduct research and reporting on evidence from TPS, the Turing and partnering organisations supporting the projects' goals
- Establish resources and engagement pathways for sectors with lower uptake of data science/AI through broader scoping within BridgeAI
- Develop impact strategy with Institute's Impact Lead.

Phase 2: Pilot (April-2023 – September-2023)

- Pilot “expert in residence” programme trialled over 6 months with experts drawn from partnering organisations
- Apply iterative learnings to support and advance BridgeAI plans

Phase 3: Scaling & Sustainability (June-2023 – onwards, subject to external funding)

- Extend the project's activities to more organisations currently collaborating with TTW, involving international partners
- Foster a cohort-based community to enable cross-sector collaboration, including in BridgeAI contexts
- Expand TTW materials to consolidate BridgeAI proposal
- Attract external investment towards the sustainability of TTW Practitioners Hub.

**Milestones - word doc only (not submitted)**

TTW Events	
Book Dash Events	Nov/May throughout
Fireside Chats	Monthly
Innovate UK – BridgeAI Proposal	
Proposal development & planning	Q4 2022
Priming event	Q1 2023
Innovation Labs Planned	Q2 2023
Ongoing BridgeAI delivery	Q3 2023 onwards (roadmap to 2026)
Practitioner Hub: Scoping and Planning	
Ethics Submission Process	October - November 2022
Participating Organisations Approached	October 2022

Pilot Co-Design	November 2022 – February 2023
Pilot Contracting Set Up	February - April 2023
Practitioner Hub: Pilot phase	
Pilot Programme	April - September 2023
Wrap up & Evaluation	October 2023
Pilot Review	November 2023
Practitioner Hub: Implementation	
Programme 2 Prep & Contracting	December - February 2023
Programme 2	March - August 2024
Programme 2 Wrap up & Evaluation	September 2024
Recruitment Activities	
Science Writer Contracting	October - November 2022
Science Writer in post	December 2022
TW Researcher Recruitment	October - December 2022
TW Researcher In-Post	February 2023
TW RPM Recruitment	October - December 2022
TW RPM in post	January/February 2023
TW Community Manager In-Post	October 2022

**2.2 Progress towards the Turing 2.0 vision (250 words max)**

Please provide information on how the activity drives the Institute towards the Turing 2.0 vision (information here). Be as explicit as possible about the difference from Turing 1.0.

TTW Practitioners Hub will convene a wider audience in interdisciplinary discussions around best practices. Encompassing all themes of Turing 2.0, this proposal will deliver across the strands of Science and Innovation; Skills and People; and Ecosystem and Engagement.

The Practitioners' Hub will support the direct engagement of diverse and influential organisations in TTW and Turing more broadly. Systematic efforts will be made to build a shared understanding of open, reproducible, collaborative and ethical research with a goal to enhance quality, rigour and integrity across data science and AI initiatives.

Considerations for building high quality, democratised and evidence-based research will help build public trust in data science and AI approaches. Furthermore, open-source projects and

research infrastructures supported through the hub will contribute to the development of public goods for broader applications.

The “experts in residence” cohort approach will allow exchange of professional expertise and inspire collaborative development of interoperable and reusable resources. Stakeholders will represent diverse interests from a range of sectors. They will be supported in professionalising diverse non-traditional expert roles and career pathways, as already demonstrated by TPS community and research application management teams. The Practitioners Hub will advance TTW’s ethos for research ethics, equality, diversity and inclusion in the ways we implement data science and AI globally.

In the long term, the Hub will attract cross-sector engagement and investment towards capacity building and innovation in areas that have so far not been explored very well within the data science and AI ecosystem both in the UK and internationally.

### **2.3 Alignment with activity funded from elsewhere / in-kind benefits (250 words max)**

Please provide information on how the activity is aligned with activity funded from elsewhere and/or from in-kind benefits, such as university partner in-kind contributions, and explicitly state what activity will be additionally funded from this proposal.

The TPS programme will deliver The Practitioner Hub scoping and pilot phases using Ecosystem Leadership bid funding, with a view to securing more ambitious funding to scale this work through either Innovate UK’s BridgeAI call, or international funders such as CZI and NASA, in late 2022/2023. The initial investment from the Ecosystem Leadership funding is critical to ensure such proposals are institutionally-supported and able to ramp up effectively according to ambitious timelines set by the funders.

This proposal builds on previous investments through the ASG and Turing 2.0 programmes. Project co-lead Malvika Sharan is 100% funded by ASG until 31 March 2023, and Anne Steele, Community Manager, is underwritten by core funding until March 2024.

TTW already leverages over 350 volunteer contributors, who have collectively written over 260 pages across 55+ chapters to date, making the project exceptional value for money. Contributors include researchers, practitioners, educators, policymakers and data experts across academia, government and industry, in various domains, at all levels of seniority, representing countries across the Global South and North.

Internally, TTW will expand on established connections with projects such as The Turing Commons and initiatives delivered with the Skills Team (Data Science & AI Educators training, Online Learning Platform). Where possible, TTW will link to similar work across the Turing to amplify and extend its reach and impact. Materials and resources are produced under an open licence allowing free reuse and adaptation for future initiatives, speeding up the planning and delivery process.

## **Section 3 - Options and impacts**

### **3.1 Options evaluation (250 words max)**

Please evaluate the preferred activities against other options to achieve the activity's outcome, considering the following: What would be the consequences of not doing this activity this financial year? What other organisations could also deliver this activity? i.e. demonstrate the additionality of the activity to the landscape.

TTW has undergone a massive expansion since 2019, growing from a single book to five guides and a community of 350+ contributors. However, with just one full-time staff, the TTW team is under-resourced to deliver strategic goals and exploit emerging opportunities as a result of the project's exponential growth and recognition. Without the additional capacity, Turing and TTW will remain insufficiently credited for their influence on a growing range of open research initiatives across data science and AI, many of which build on TTW resources, like the Digital Catapult Machine Learning Garage.

To ensure the projects' sustainability and take advantage of the growing TTW network, it is crucial to invest in the development of TTW Practitioners Hub. Although the project will continue through 2023 with current funding, it will still require additional funds to support TTW activities, partnership needs and additional staff capacity to seek external funding. There is already limited scope for engaging with new sectors or follow-up on desired partnerships that require additional resources and staff time to ramp up delivery. Hence, if the proposed project is not funded soon, TTW will not be able to leverage the grassroots community movement and reputation of TTW to firmly establish itself as a leader in data science practices.

TPS is uniquely placed to deliver on the goals of TTW Practitioners Hub under Turing 2.0. External initiatives such as UK Reproducibility Network may have overlapping goals, but TTW offers deeper expertise and collaboration afforded by TTW community and project team.

### **3.2 Expected impact and benefits (250 words max)**

Please explain what the impact and benefits of the activity would be. If this is an existing activity which is being extended, please also outline the benefits realised so far.

To date, TTW materials have formed the basis for high-impact training materials produced by national and international organisations [names redacted].

It has directly influenced data science practices at national organisations such as ONS, British Antarctic Survey, Health Foundation and Genomics England - GDDI. The project model has also been successfully replicated by the Environmental Data Science Book, Turing Commons, University of Oxford's FAIR Cookbook, among others. The project is also referenced by reports and peer-reviewed articles, including in the 2022 Goldacre Report.

Proposed impact and benefits of the proposal include:

- Improving dissemination and adoption of TTW resources and best practice across the UK data science ecosystem
- Scaling efforts to support innovative best practices in historically under engaged communities and sectors in data science
- Diversifying partnerships with key organisations such as Genomics England, - GDDI ONS, Digital Catapults, and eventually international organisations such as NASA, TU

Delft, VU Amsterdam, eScience Center Netherlands, 2i2c, The Carpentries, Open Life Science and MetaDocencia.

- Strengthening TTW's position as a central hub for connection across domains to bring together best practice in data science and AI.
- Building reputation of Turing for setting national and international standards on reproducible, ethical, open and collaborative data science.

The Turing Impact Lead will support the planning of a robust and integrated evaluation approach in line with Turing 2.0's impact strategy. The work carried out during the pilot stage will inform the development providing thought-leadership in planning and delivery around strategic engagements.

### **3.3 Key Performance Indicators (100 words max)**

Please list any KPIs that will be used to measure the impact and benefits outlined above

Scoping phase:

- Number of organisations that complete an expression of interest in participation in TTW Practitioners Hub
- Successful delivery of BridgeAI priming event and proposal
- Book Dash hubs outside of London hosted/attended by hub stakeholders
- Engagement drawn from the Turing and partner organisations in research and reporting

Pilot phase:

- Quality and number of unique contributors within organisations that participate in the programme vs those without a formal engagement
- Areas of the guides which have been contributed de novo by organisations engaging with the programme
- Comparative analysis of baseline narratives and surveys vs end-of-programme evaluation

### **3.4 Embedding Equality, Diversity and Inclusion (250 words max)**

Please consider and explain the steps that will be taken to make this activity inclusive and accessible and the strategies that will be used to encourage diversity of participants. If your activity will involve re-allocating funding or resources, please explain the process for this and how fairness and transparency will be achieved.

TTW Practitioners Hub will be designed as a socio-technical infrastructure for community-based development, maintenance and long-term sustainability of TTW. All the project outputs will be shared under a CC-BY 4.0 Licence so that everyone can freely read, reuse, distribute, modify, and contribute back. We foster a culture of collaboration by creating equitable opportunities for community participation and enabling an inclusive collaboration by providing a clear code of practice and contributing guidelines.

TTW guides directly address EDI in data science and AI. All resources embed universal design principles, considering online accessibility, language, and disability requirements. Our resources provide recommendations for researchers on how to build diverse teams and create inclusive workspaces spanning topics from remote working to running inclusive events and participatory

co-creation. The guide for Ethical Research grapples with the realities of ethics in AI, and shares principles from Responsible Research and Innovation and Research Integrity. TTW team has provided a working example of team science, involving a wider community to define the practices, standards and expectations for responsible and ethical data science. This approach has empowered diverse individuals from different backgrounds, identities and lived experiences to express their viewpoints, represent different realities and involve voices from communities marginalised in data science and AI. TTW was highly commended by HiddenRef and received positive feedback from the Royal Society Athena Prize for its commitment to EDI.

TTW Practitioners Hub will build on the existing practices to directly work with the partnering organisations, specifically drawn from a range of domain expertise.

### **3.5 Will you be monitoring the diversity of who engages with your activity? (250 words max)**

Please detail your reasoning and if relevant, how monitoring will be carried out.

Although the potential partnering organisations have already been identified within the UK for the initial pilot, TTW will continue to employ diversity monitoring as standard practice for ongoing project activities such as Book Dashes. As described in section 3.4, we will ensure that TTW values and ethos are applied to all the processes of community engagement and building, as well as the nomination of representatives from collaborating organisations.

After piloting the programme, we hope to expand the hub to involve international partners. As a globally distributed community, TTW team will aim to draw collaborating organisations from both the global South and North with diverse participants as 'experts in residence'. A diversity enhancing and monitoring framework will be developed during the planning and scoping phase, which will massively build on TTW's community engagement work. This framework and the associated process will be reviewed in May 2023 by involving diverse members from TTW community.

## **Section 4 - Costings**

Please upload costings using the appropriate template (available here).

### **Operational Budget**

- 1 FTE TPS RPM time from 1/10/2022 to 31/12/2026 to support delivery,
- 0.2 FTE project co-lead Malvika Sharan from 31/03/2023 – 31/12/2026 (funded 100% by ASG to March 2023)
- 0.05 FTE project co-lead Kirstie Whitaker from 31/03/2023-31/08/2024 (need to check KW allocation)
- 24-month fixed term contract for PDRA / (researcher and strategic hub coordinator) to document Turing Way & TPS Practices – to start 1/1/2023
- 24-month contract for Turing Way CM to continue project delivery (1/09/2022-31/08/2024) - in post & currently underwritten by core
- 5-month contract for a technical writer to begin building TPS and TTW documentation required for the development of TTW strategic hub (1/10/2022-31/03/2022)
- Book Dash costs from 01/09/2022-31/08/2024 (four events, held in a hybrid format at £10k each)



- Travel and conference costs from 1/09/2022-31/08/2024 (£2000 to March 2023, £2000 to March 2024, £1000 to August 2024)

## Section 5 - Operational considerations

### 5.1 Delivery (250 words max)

**State the delivery model for the activity. Will it be owned by the Institute or led by a partner organisation?**

The project will be owned by the Institute, with partner organisations engaged via TTW Practitioners Hub. Work conducted during scoping, and resources underwritten by core following the conclusion of

#### Scoping phase to 31 March 2023:

- Impact assessment framework will be developed in collaboration with the Turing Impact Lead
- A technical writer will be contracted to document outcomes, impact stories and documentation to help build stronger evidence for TTW and the Turing's position to lead TTW Practitioners Hub
- Project leads will design the engagement strategy in collaboration with all relevant Turing teams and strategic organisations mentioned previously in the proposal
- BridgeAI proposal co-developed and priming event delivered by Turing in
- 'Expert in residence' scheme will be developed by consulting organisations (Software Sustainability Institute, Open Life Science) that have similar schemes
- Recruitment and onboarding of a postdoctoral researcher
- Delivery of one Book Dash event as an early engagement opportunity

#### Pilot delivery phase 1 April – 1 October 2023

- A cohort of 'experts in residence' will be established for the Practitioners' Hub
- Engagement strategy will begin delivery, including embedding experts in TTW network, facilitating events for engagement, training and collaboration
- Curation of resources by each expert from TTW for their organisations will be supported and highlighted in the projects
- Collaboration with Turing Commons will be strengthened to build organisation or sector specific case studies which will be highlighted in multiple channels

Details for longer-term delivery are provided in section 6.

### 5.2 Resourcing and recruitment (250 words max)

If recruitment (employees) is required, please outline: any existing resources that will be redeployed, any additional resources that will be required – extending employment contracts or new hires (give job titles). If external contracts will be required, please outline: if an existing contract can be amended/extended to meet the need, any additional contracts that will be required, what contractual mechanism, etc., how the contracting partner was or will be selected

If the activity will need additional support from other teams at the Institute (Comms, Events, Finance, Programme Management, Partnerships, Research Engineering, etc.), please give brief

details here. Note that any significant involvement will need to have been reviewed and signed off by the relevant director on the funding application approvals form.

Existing resources that will be deployed:

- Turing Way Community Manager – in post, contract will be extended to 31 December 2024
- Malvika Sharan, TTW co-lead & TPS Senior Researcher – in post
- Shane Conneely, TPS Partnerships Lead
- Arielle Bennett, TPS Programme Manager
- TPS RPM (currently recruiting) will support initial project set up. A dedicated RPM will be needed to support scaling of the Practitioners Hub and delivery of BridgeAI.

**New resources:**

- New post for a TPS postdoctoral researcher (24 months<sup>[AB6]</sup>) at senior research associate level (band 4): They will be hired to lead the engagement strategy and facilitate interdisciplinary collaboration among the TTW practitioners hub stakeholders. This role will be extended if BridgeAI is successful, and may be suitable for internal recruitment
- **0.5 FTE RAM to support the adoption of The Turing Way across stakeholders and development of outputs from users' perspective**
- Technical writing contractor (5 months): To ramp up TPS and TTW documentation required for the development of TTW Practitioners Hub and BridgeAI work, we will require an external contractor,
- "Experts in residence": We will be aiming to set up two rounds of partial secondments or external fellowship awards for the nominated experts from partnering organisations (see section 6) at approximately 0.2 FTE for 6 months. The most suitable agreement mechanism will be developed during the scoping phase, since we envisage a need for flexibility due to the diversity of organisations targeted.
- Funding for 4 Book Dash events and monthly Fireside Chats throughout the course of the project.

### **5.3 Risks and mitigations (250 words max)**

Please break down: any known risks to the activity meeting its deliverables, the potential impact of these occurring, mitigations that could be put in place. Any assumptions, dependencies, exclusions or constraints

Risk: Unclear expectations and outcomes for Practitioner Hub organisations,

- Impact: Low engagement with scheme, reputational damage for Turing.
- Mitigation: a project charter will be developed at the beginning of the project. Roles and responsibilities and modes for engagement will be transparently shared. Our partnership lead will negotiate memorandums of understanding for each organisation.

Risk: Researcher recruitment proceeds slower than expected

- Impact: Preparation for the "expert in residence" scheme is slowed and is not ready to launch in April 2023

- Mitigation: Freelance science writer contracted and rapidly onboarded to support documentation and resource development with TPS and TTW

Risk: Organisations unable to participate due to operational constraints around secondments

- Impact: Lower than expected engagement, bias in organisations that participate
- Mitigation: Scheme designed with multiple, flexible avenues for participation and initial duration kept to 3 months

Risk: Misalignment of Practitioners' Hub's engagement strategy with internal policies and practices

- Impact: unacceptable operational risks, lack of internal oversight, reputational risks
- Mitigation: TTW team will work with Academic Engagement, People, Training and Partnerships teams when designing the Practitioners' Hub. The Impact Lead will help design and implement the project's evaluation plan.

Finally, as the project will involve highly influential organisations, to avoid the risk of investing resources in unaligned partnerships, we will start by piloting the hub with selected organisations that have already expressed interest in collaboration. We will deliver the first round of 'experts in residence' as a prototype, gaining insights and iterating before we pursue a large-scale collaboration model.

## Section 6 - Additional information and feedback

### 6.1 Additional information (500 words max)

Please outline any additional information that would be useful for the Review Panel to consider.

Impact statements from recent collaborators included: Chelle Genetemann, NASA-TOPS, USA; Laura Acion, MetaDocencia, Argentina; and Chris Erdmann, American Geophysical Union, USA

#### 1. Convening forum

TTW Practitioners Hub will be formed through a convened forum with pilot stakeholders on a cohort basis. They will be supported across the other three streams to strengthen their skills and achieve wider impact. Through lessons learnt from the pilot, an engagement framework will be established to build new cohorts of organisations with less prior engagement with TTW.

Additionally, mission aligned initiatives such as The UK Reproducibility Network and AI Standards Hub, and projects such as Data Study Groups, Turing Commons, Data Safe Haven, and Health programme, will be invited to benefit from knowledge exchange, upskilling and engagement opportunities offered in the hub.

#### 2. Collaboration and supporting practitioners

The “expert in residence” model will support one member from each external organisation in TTW Practitioners Hub through a funding award or partial secondment. During their 'residence', they will:

- Build capacity for and capture the impact of best practices for reproducible, ethical and collaborative data science in their organisation.
- Develop specialised sector specific examples, case studies, recommendations, training resources or ethical considerations around data science from their areas of work to share via TTW.

- Engage with TTW community to curate specific resources to drive the adoption of data science and AI in their communities.
- Gather input and contributions from TTW to improve their strategy for the implementation of data science in their domains and communities.

### **3. Engagement and knowledge exchange**

TTW will run a series of knowledge shares and events as part of the Practitioners' Hub cohort.

Additional activities may involve:

- Workshops to explore how government/industry/public sector/academia currently integrates best practices in data science and AI.
- Developing their organisation's own strategy around open-source communities and communities of practice
- Contributing to policy briefs and enquiries to raise the profile of data science and AI best practice.
- Participating in TTW community events such as Collaboration Café and Book Dashes (Nov 2022 and May 2023)
- Hosting Fireside Chats, with support from TTW Community Manager

### **4. Acceleration of innovation adoption**

Participating organisations will be supported to involve their members in wider discussions on how to build better and socially impactful data science products. For this, TTW team will build a standard toolkit for capturing insights and practices and develop guidelines for others considering embedding similar practices. Specifically, experts will be guided to evaluate and report on the impact of data science in their sector and to make the case for further digital innovation. Budget will be allocated to support events and activities in their organisations for creating resources, workshops and embedding curated TTW resources into daily work.

#### **6.2 Do you have any feedback about this application process? How might it be improved in the future? (250 words max)**

Some more guidance for what "impact" in this proposal means will be helpful.

To make the proposal writing as well as review more effective, please consider providing the rubric against which the proposal will be evaluated.

Maybe rebuttal instead of resubmission could be helpful for reviewers to re-evaluate resubmitted projects against critical feedback/criteria under which the initial proposal was rejected.

### **Section 7 - Applicant declaration and sign-off**

7.1 Please upload an application support form with the necessary signatures (instructions on the form and in the guidance/FAQ document). Form available [here](#).

7.2 I declare to the best of my knowledge the information that I have provided on this form is true, accurate and complete. I understand and hereby agree that if I am offered funding, it will be on the basis of this information and that a false statement may result in withdrawal or termination of the funding.

7.3 I confirm I have read and agree to the privacy notice and the storage and processing of my data as described therein. I understand that we may share some details of successful applications internally, for example on Mathison (our intranet), externally, for example with EPSRC, and publicly, for example on our website.