

# Incubating Sustainability

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Learnings from the Digital Infrastructure Incubator at  
Code for Science & Society 2021-2023

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## Executive Summary

From 2021-2023, the Digital Infrastructure Incubator (DII) at Code for Science & Society (CS&S) was a capacity-building program for digital public infrastructure project leaders. Our work in this program moved to advance the sustainability of open source technologies by offering resources and support to open technologists as they iterated around the conceptualization and design of their sociotechnical infrastructure. Across two cohorts, the program provided \$54,000 in participant stipends; training and mentorship to 22 open infrastructure project leaders; connected these leaders with 15 additional mentors; and hosted 7 public events reaching an additional ~300 participants.

## Findings summary

Participants in the DII displayed a set of patterns indicative of how technologists approach social structures and cultural change in their projects. It is crucial that funders and other capacity builders understand these patterns and proclivities in order to build meaningful professional pipelines, leadership resources, and DEIBA (Diversity, Equity, Inclusion, Belonging, Accessibility) support across the ecosystem. Generally, these patterns can be summarized as follows:

1. Participants approach social and cultural dynamics involved in the building of open technology as if they may be fixed once and for all. They look for checklists, formulas, or codes. There is very little capacity or previous experience to think about and work on developing systems or processes.
2. Existing resources (books, articles, reports, exercises, worksheets, curricula of open training programs) are little known. When leads are referred to them, they are poorly read or used without synchronous support.
3. Project leads struggle to take risks and break down or deconstruct assumptions and norms about efficiency and equity in organizational dynamics and community accountability. Attention to meaningful project design and organizational development is sporadic and inconsistent.
4. Leads rarely have interlocutors with whom to discuss and consider questions of organizational development.

These findings reveal an acute need for cohort-based, synchronous, and well-facilitated training and group-based learning for public digital infrastructure projects around program design and project governance. There is a real need for capacity-building groups, funders, and intermediaries to foment the social conditions in which innovation and risk-taking around the development and sustainability of social infrastructure can take place. By cultivating risk-taking, vulnerability, and innovation in the building of project governance, community outreach and innovation, and localization we may really make an impact in terms of how public interest tech is designed and for whom.

# Introduction

## Context

The program was developed with the hypothesis that widely available recommendations for best practices to improve the community health of open source projects were not moving the needle on questions of improving participation, increasing diversity, and ultimately affecting the precarity (under maintenance, unsustainability, inequity) of open source projects. The program was proposed as a research and practice project that would answer the question: how to bridge the gap between research recommendations and real-world practices?

Thinking for the program was influenced by a host of open source leadership programs, political education for tech curricula, and non-profit consultancy models, including the [Mozilla Open Leadership Series](#), the [Openscapes Champions Lesson Series](#), the [UNICEF Open Source Inventory](#), Educopia's [Field Guide for Community Cultivation](#), Lyrasis's [It Takes a Village](#), GitHub's [Open Source Guides](#), [The Open Source Way 2.0](#), the [Frictionless Data Fellows](#) program, the [Turing Way](#), the [Logic School](#), and the [Participatory Budgeting Project](#), among others.

## Support and founding

The DII welcomed its first cohort in 2021-2022 with a \$150k grant from the [Digital Infrastructure Fund](#) (the Ford Foundation, the Alfred P. Sloan Foundation, the Open Society Foundation, Omidyar Network, and Mozilla). In 2023 it welcomed a second cohort with additional support from the Ford Foundation and Omidyar Network. In 2024, CS&S closed its original, grant-supported programs department.

## CS&S

Code for Science & Society (CS&S) is a US-based 501(c)(3) nonprofit supporting open source and collaboration in public interest technology through fiscal sponsorship and programs that support sustainable open source. As a fiscal sponsor for public interest technology, CS&S serves projects from research-driven open data science to open civic data with strategic support and mentorship as well as financial and administrative services. Through years of this work, we know first-hand the common gaps and oversights that projects struggle with. This program was developed to intervene to address challenges identified through our fiscal sponsorship work.

Dr. Danielle Robinson and Joe Hand secured initial funding. Dr. Rayya El Zein was hired to develop and execute the DII in 2021. She ran the first cohort and the public event series associated with it. In 2023, Miliaku Nwabueze, MFA was hired in part to carry on the program and lead programming for the second cohort. Dr. Angela Okune oversaw programming. Bios for CS&S staff included in Addendum 3.

## Research Questions & Hypotheses

High quality research-based recommendations that aim to improve open source digital infrastructure are plentiful. However, in order to move these recommendations into practice, open digital infrastructure teams need 1) to be directed to the research at the right moment, and 2) to be supported and held accountable through the process of real-world implementation. With the increased importance of open digital infrastructure and proliferation of small, grant-funded teams, the gap between research recommendations and real-world practice is sizable. ***What happens when project leaders are given time, material support, research-based recommendations, mentorship, and a cohort of colleagues with which to iterate designs around a single human infrastructure challenge?***

## What We Did

Across two cohorts in 2022-2023, the program provided \$54,000 in participant stipends as well as training and mentorship to 22 open infrastructure project leaders. The program additionally engaged 15 mentors and held 7 public events gathering over 300 additional participants.

## Cohort 1

### Cohort 1 Open Call

The first cohort in 2021-2022 welcomed open source digital infrastructure projects interested in questions of governance, community engagement, or localization. We hosted 6 projects for 6 months and provided \$5,000 stipends to each. This cohort was offered support as they:

- Developed organizational frameworks (mission, guidelines, documentation)
- Tested and refined organizational literature (codes of conduct with usable, testable enforcement guides; revised governance documentation articulating pathways to leadership)
- Plotted collaborations (towards technical interoperability, shared resources, joint advocacy agreements, and/or multi-stakeholder partnerships)

### Cohort 1 Reflections on Submissions

We received ~ 65 submissions to the program. There was a range from very new projects with little to no existing infrastructure that identified needs like looking to bring in workers to get the project up and running and projects looking to design their first interface. There were also much more established projects looking to explore a question they hadn't had opportunity to focus on, asking questions like: How to scale a network? How to shift resources within a network? CS&S Staff narrowed down a short list and then deliberated the final roster with an invited, external selection panel.

In 2021-2022, the Incubator hosted 6 projects, grouped in 3 thematic pairs.

- In the **governance** focus area, open source projects dependent on volunteer labor worked to build transparent decision-making models that scale with growth.
- In the **community engagement** focus area, teams were thinking about how to build in the open; how to engage and retain developers, volunteers, and an interested public; and how to build those audiences into the documentation and governance of their projects.
- In the **cultural infrastructure** focus area, teams considered how to build the cultural infrastructure (translation, localization) needed to further open science and open software where the exposure to working in the open is minimal or doesn't exist at all.

## COHORT 1 PROJECTS

### **Building Community around the R Development Guide**

*The R Development Guide is a beginner-friendly guide to help new contributors to the R project. A first draft of this guide exists and the next step of this project is working on outreach and building a sustainable community around it.*

In the Incubator, project leaders [Saranjeet Kaur Bhogal](#) and [Heather Turner](#) worked to engage people in using and refining the R Development Guide, to fulfill its purpose of on-boarding people from underrepresented communities. They aimed to further the development of this project by working on its outreach, focus on improving community health and diversity by getting people more engaged and the work of connecting people to the guide, both as learners and mentors.

### **Citation File Format**

*The Citation File Format (CFF) lets you provide citation metadata for software (or datasets) in plaintext files that are easy to read by both humans and machines. The project develops the open format itself, its definition and schema, as well as documentation and open source tools to work with the format. Recently, several platforms such as GitHub, Zenodo, Zotero, JabRef and others, have implemented support for the Citation File Format.*

The Citation File Format project has recently seen uptake by major platforms and the project's needs in terms of governance and actionable community documentation are growing. In the Incubator, project leader [Stephan Druskat](#) sought to build a governance structure that would identify the foundational aims of the project and adapt them where necessary to grow and sustain the project community.

### **Council Data Project**

*The Council Data Project's mission is to improve public access to municipal legislation. To achieve this, CDP has created a number of open-source tools to collect, index, and enable the discovery of municipal government data – including the transformation of audio-recorded public meetings into high-quality text transcripts.*

As an open-source civic tech project CDP attracts interest from a wide range of people - from open-source developers to politicians, journalists, and citizen activists. During the incubator, project leads [Eva Maxfield Brown](#) and [Nicholas Weber](#) worked to design a governance structure that would allow CDP to sustainably grow the number of contributing members while still focusing on service to politicians, journalists, and citizen activists.

### **Ersilia Open Source Initiative**

*EOSI's mission is to lower the barrier of entry to state-of-the-art artificial intelligence and machine learning tools for researchers dealing with neglected infectious diseases in low and middle income countries. Our vision is that of a world with open science and egalitarian access to healthcare.*

In the Incubator, project leaders [Gemma Turon](#) and [Miquel Duran Frigola](#) worked on a strategic plan to engage data scientists and developers and improve participation in their project governance. They

considered different frameworks of “collaborative leadership”, and worked to identify the limits of responsibility and level of decision-making, among others.

### **Solar Protocol**

*Solar Protocol is a growing community of server stewards that host servers around the world. The project is part poetic exploration of internet infrastructure and part research platform for energy-efficient web design.*

In the Incubator, project leaders [Tega Brain](#), [Alex Nathanson](#), and [Benedetta Piantella](#) worked on developing more documentation and educational resources, as well as developing community guidelines and decision-making protocols. They explored questions like: how can we better support the project stewards and evolve this project to a point where it doesn't rest solely on the project founders' voluntary labor to maintain it?

### **Open Science Community Saudi Arabia**

*Open Science Community Saudi Arabia (OSCSA) focuses on installing values, enhancing knowledge, and improving equal access to education.*

In the Incubator, project leader [Batool Almarzouq](#) explored the limitations of existing digital infrastructure to adopt FAIR data practice in Arabic-speaking countries. FAIR principles are one of the most important practices in Open Science, but they have limited reach in the Middle East, where open science advocates face unique technical, legal, and cultural challenges. Almarzouq worked to identify the needs of the local community towards recommendations that can drive new policy that fosters a FAIR data culture while maximizing the accessibility and functionality of local data and scientific outputs.

## Cohort 1 Curriculum/Approach

“Sustainability” is, first and foremost, used as a corrective, a counterbalance,” writes Jeremy Caradonna. A core thread of cohort 1 was working with teams to try to identify what they needed “to correct” in order to make the work feel more sustainable. Following Caradonna’s assertion that sustainists “look at complex systems and find relationships,” programming around visioning and outreach in this cohort prioritized processes of building organizational culture.

When we say *the culture of open source*, or *the culture of [your project]*, we typically mean something fixed. But what if, when we say the culture of \_\_X\_\_, we meant the *practice of cultivating \_X\_*? What if the “culture of open source” meant “cultivating open source”? How would that change how we orient towards our projects or the ecosystem it’s a part of? (Excerpt from 2021-2022 curriculum)

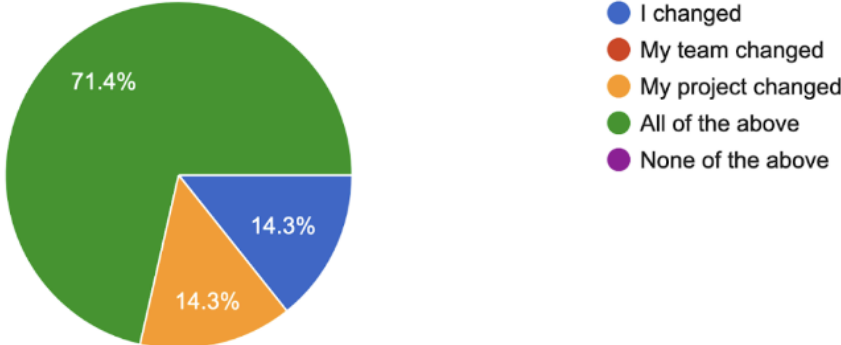


Cohort 1 Participant feedback and observations

Participants affirmed cohort programming expanded horizons and encouraged new ways of thinking. 71% of participants affirmed the team, themselves as individuals, or the project as a whole changed as part of the program

4. Over the course of the Incubator:

7 responses



## Cohort 1 Individual Testimonies

### *Introduce participants to new ways of thinking*

- "Our team has changed because we now have the necessary tools to talk about governance and mission/vision, whereas before we were just following our intuition."

### *Hold space for experimentation*

- "The Incubator provided a safe and inspiring framework to develop the groundwork for a new governance model."

### *Change approaches to growth, community, sustainability*

- "The incubator work also changed the way I view the vision and scope of the project in general, as the central component that should drive future development"
- "My approach to growing and scaling projects changed. I adopted a more sustainable approach to working for communities"
- "I changed in the way I see the project grow in the future, as a comfortably controlled, but more openly governed entity"
- "I have changed in the way I relate to the rest of my team"

### *Comfortable enough with new frameworks to apply to other aspects of project*

- "Discussions around incubator topics such as ethics and governance have clearly been moved to the center of conversations within the project team."
- "The resources and discussion also inspired me - and by extension, the project leadership as a whole - to think about potential ways forward in terms of funding/fiscal sponsorship."

## Cohort 1 Program Learnings

In general, with feedback like that quoted in the box above, cohort 1 was considered a success. We considered slightly longer timeframe than 6 months could be beneficial. (Contracting and onboarding took longer than expected). We also decided for the next cohort to focus on one of the thematic threads (community engagement) instead of trying to do three (governance, and community engagement, and cultural infrastructure).

## Cohort 2

### Cohort 2 Open call

In 2023 with support from the Ford Foundation, the DII convened an 8-month cohort with an explicit thematic focus of building and transferring power. We invited expressions of interest from open infrastructure project leads who were exploring models of community stewardship and co-ownership. The 2023 cohort prioritized work with leaders that have already recognized that growth requires attention to co-design with affected communities. We invited technologists who were considering issues like:

- Distribution of resources across an uneven network
- Legibility and translatability of participant needs, values
- Localization, translation, adaptation
- Infrastructure for growth, leadership, representation
- Infrastructure for ownership and stewardship
- Infrastructure for succession, transfer, eclipse

Projects could be new or quite developed, but project leads must have experience with community-centered work. They should be exploring the limitations of current models and looking to experiment with new ones. Priority was given to teams and technologies working with communities historically underserved by technological innovation. Applicants were not limited by geographic location or primary program language.

### Cohort 2 Reflections on submissions

We received 80 submissions from a range of projects and project leads. We observed a significant reapply rate (from 2021) and a range of definitions of both “community” and “engagement.” CS&S staff produced a long list and then an invited, external selection committee narrowed down selected teams. 4 teams were granted a \$7,000 stipend and invited to join an 8-month program running March - October 2023. All four selected teams centered impact in specific communities while straddling multiple stakeholders/collaborators.

## COHORT 2 PROJECTS

### **Open Restitution Africa**

*Molemo Moiloa and Chao Tayiana Maina lead the Open Restitution Project, an Africa-led project seeking to open up access to information on the restitution of African material culture and human ancestors, to empower all stakeholders involved to make knowledge-based decisions.*

Open Restitution Africa (ORA) is an African-restitution-centered project founded by Molemo Moiloa (RSA) and Chao Tayiana Maina (Kenya). The project is premised on facilitating better access to information about processes of restitution of African material culture and human ancestors from museums across the world back to the African continent. By collating existing data relating to restitution debates, ongoing issues and progress, we offer valuable insights into current concerns around restitution. We focus on the needs and discourse on the African continent specifically, and work towards tools for African restitution activists and African publics.

### **Open Digital Infrastructures for the Care of Living Memory**

*Juan Ramos, Carlos Barreneche, and Offray Luna are exploring how the co-design and appropriation of open digital infrastructures favor the community care of living memory. This project seeks to bridge the gap between indigenous forms of design and cosmology with modern design epistemology in La Chorrera, in the Colombian Amazonas.*

This project is conceived as an intervention and intercultural exchange among three Colombian territories and communities: *Grafoscopio*, a hacktivist community located in Bogotá; *Los Pueblos del Centro*, four indigenous communities from the Colombian Amazon; and *Setas Libertarias*, an emancipatory economies and food sovereignty collective located in Andean region. It aims at exchanging and building capacities among these communities to design autonomous memory infrastructures. Translating their worldviews and ways of knowing in information infrastructures that conform to the oral nature of their knowledge and their values, so they could take care of their memory via technological appropriation.

### **Open Agroecology Lab**

*In and around Mendoza, Argentina, Nano Castro and team propose to integrate several low-cost and open source methods and instruments into a lab to accompany peasants, farmers, students and researchers in the visualization and documentation of changes produced in farms during their transition towards agroecology.*

The Open Agroecology Lab is an assemblage of people, spaces, scientific and digital tools aimed at the systematization and sharing of experiences among peasants, farmers, researchers and students to enable the collective learning and public amplification of agroecology. We believe that bottom-up proposals for the digitalization of agroecological experiences, like ours, can support and strengthen the public valorization and acknowledgement of agroecology and the resistance to the current AgTech

wave that will only intensify the pressure on small farmers to increase their technological dependency to corporations.

### **Internet of Production Alliance**

*Sarah Hutton, Max Wardeh, and Barbara Schack enable a global alliance of people and organizations who believe in a future of production defined by decentralized manufacturing and shared knowledge. They are building a foundation to enable this future, a world where people can quickly create and fabricate products made from a combination of locally sourced materials and globally sourced designs.*

The Internet of Production Alliance (IoPA) is a global network of people and organizations who believe in a future of production defined by decentralised manufacturing and openly shared knowledge. We are building a foundation to enable this future, which we envision as a world where anyone, everywhere, can quickly create and fabricate products made from a combination of locally sourced materials and global designs. We are about to embark on a “governance reboot.” We aim to (re)define how the Alliance is governed, how the digital artifacts we steward are built and then sustainably governed by this global community.

### Cohort 2 Curriculum/Approach

In the open ecosystem, there are divergent interpretations of “community engagement,” “co-design,” “cooperation,” “collaboration” and the importance of each in different open sectors.

In this cohort, we proposed that building, engaging, sustaining, and being held accountable by communities of users is more than a question of public communication (i.e. how am I using Slack? Did we post the information on Instagram?) and should not be reduced to a checklist (i.e. Do I have a code of conduct? Are x people in the room or chat forum?). Instead, meaningful community engagement is a set of processes that are inextricable from power dynamics of a given ecosystem and group of stakeholders within it.

Given this understanding of the work, we considered the following needs in designing programming for this cohort:

- The politics and political considerations in personal and electoral realms represented by the cohort
- The need for political education in relationship to technological work
- The myriad of meanings of co-design vs. our definition
- The effective nature of the activities and their potential to be shifting and engaging
- Our ability to weave in learnings from the previous year
- Access needs to engage in practice work

The purpose of the DII Cohort 2 was to source answers to the following questions:

1. What cooperative, relational infrastructures and roles emerge across different cultural contexts in the pursuit of building open technology?

2. How might we deepen the conversation about and expand available resources that understand practices of community engagement, co-design, cooperation as processes that center the impacted users of open technology?
3. What is the relationship between governance and the technical infrastructure we are building? How do these mirror each other? Related questions: How does this tech support the relationships we want to uphold? How does the database support building and strengthening communities of practice? What are the features of the database that scaffold and uphold relationships within the real world?

### Cohort 2 Participant Feedback

Some key recurring and open reflections/questions from participants in this cohort include:

- How do you pivot to an open governance model?
- How do we work towards a speculative future when existing within the frameworks of our various realities and their opposing forces?
- How much data do we share?
- How open is open?
- Recognising the work we do is controversial, we are creating a different world and this requires the destruction/unlearning of what we are working within
- What does our horizon look like? What future are we working towards? To what extent do we believe in this future?
- How does the infrastructure we build also enable the community to collectively imagine what a horizon looks like?
- Outlining a language for how we articulate our horizon to different members within our community

## Cohort 2 Program Learnings

In this cohort we leaned into the reality that we ourselves had to **experiment with how we invited experimentation**. When it came time for participants to come up with a “research plan,” participants got stuck proposing something that wasn’t a piece of documentation. We realized the robust templates we had developed led to a project-management orientation rather than a focus on making and practicing relationships. So instead of going with a template, we offered them an example and guided people out of the habit to just write something up. Generally, participants **struggled with visioning**. At first, the DII program manager thought she was unclear so she reiterated herself. However internally, we realized that it might be neither or both, and an adjustment needed to happen. Thus, we decided to embrace the fact that people were going to struggle. And to imagine ourselves and what we offer as the “wrestling mat” where such struggling can happen.

We also leaned into our understanding of **the value of synchronous time**. We found the speaker talks were richer engagements than calls about readings. Time should be longer for certain things. We found a diverse approach to meetings and programming held the attention of participants and they found it easy to remain engaged. Finally, we noticed that the more points of interaction with the cohort we offered, the more excited and clear participants seemed about what they were doing. Over time, participants started doing more work and being more excited about the work they are doing, especially when we increased the amount of meetings and gatherings we had.

## 7 Observations across Both Cohorts

We gather the following 7 high level observations across both cohorts. We consider these observations on how leads approach and engage this work of developing social infrastructure to be useful to capacity builders, funders, and other tech leads as they determine where and how to spend resources and support.

1. **Teams want fixes** (a document, a body, a tool) that they can write, assemble, or implement that would resolve a given problem, dynamic, or scope of work to be done. Teams read resources, but sporadically, inconsistently, un-thoroughly.
  - a. All teams want prototypes (a la [community rule](#)).
  - b. It is hard to trace the development of processes or outputs from access to a written resource.
2. **There are few resources about developing processes - or even about sequential work.** (ex: All teams struggled putting together visioning statements but very few returned to this on their own.)
  - a. Leads have little appetite for discussing failure and experimentation with regards to sociotechnical infrastructure. Despite sustained attention to failure and the value of failure in our iterative practices and frameworks, projects struggled to imagine failure as shortcomings of ideas (much more easily identify lack of time, problem with tools/accessing tools).

- b. Teams lack tools for navigating dissensus. Collaborative project leads, even those with a working relationship, often have divergent, competing ideas about what they're building and how with real implications on how internal decisions get made.
  - c. All governance is political - who makes decisions and how are fundamental questions about power and relationality (trust). Prototypes and tools are only entry points to engaging in political discussions.
  - d. Most teams end up trying to balance autonomy for pieces of the project with centralized authority.
  - e. Leads often do not have interlocutors with whom they can (or readily do) speak to about non-technical aspects of their work (decision making structures, how to identify bias, financial and/or communication strategies, transparency in project documentation).
3. **All teams needed assistance network mapping and developing financial strategies**
- a. *Governance is intimately connected to financial strategy and network map. What kind of oversight do your funders require? Who can help you network with funders or investors and advise on their priorities? Who can help you build accountability with communities?*
4. **Capacity building efforts across the ecosystem are not strategically designed in sync with each other.** They may acknowledge others exist, but less of a sense that things are meant to diverge (politically, technically, or otherwise) - most specification is by sector; little sense that resources may be used in sequence or tangentially.
- a. Tools, resources, support to address translation and localization are the least developed of all the capacity-building tools around social infrastructure.
5. **Community engagement is often presumed to be a synchronous, external facing activity, not a question of internal structure.**
- a. Autonomous tech collaborations, even those informed by left politics, still often depend on and are limited by university infrastructure.
  - b. It is necessary to be specific about who you are trying to include. You cannot effectively be accessible to everyone.
6. **The instinct in supporting localization work is to find or direct teams to *other regions*.** *Intra regional cross-sectoral comparisons very rarely emerge as viable examples to learn from (ie localization in a different industry in the same region/language/cultural context).*
7. **Local power dynamics and inequities are almost always underplayed in deference to global questions of representation.** This includes local dimensions of colorism, class, gender, ability. Projects based outside of the US/Europe most readily compare and contrast themselves with counterparts in US/Europe.



## Recommendations

Despite much of it being publicly available, most technologists are not aware of/ do not have access to resources about developing social infrastructure. When they are aware of publicly accessible resources, they struggle to use them effectively on their own (unfacilitated or without a peer group). Our findings in this program strongly suggest that publishing open access asynchronous guides, resources, and other documentation is not enough to significantly change organizational practices or meaningfully develop the capacity to build and design innovative and accessible social infrastructure.

The program as designed did not meaningfully build an alumni network. Such a network could have worked to provide a larger cohort experience past the synchronous commitments of the two rounds of the program.

## Conclusion

The question of scaling capacity building support is increasingly present in deliberations between funders and intermediaries like CS&S. One tendency in figuring out how to scale sustainability support to multiple cohorts of grantees is to consider the production of asynchronous resources. A generation of research about the sustainability and maintenance of community health in open source already exists; it has helped some individual leads but has done little to move the needle on material questions of diversity and inclusion across the ecosystem. Our work in this program suggests that technologists struggle to repeatedly take risks, develop processes, or even engage sequentially or iteratively in the development of their technology's social infrastructure – a project's governance, design for community engagement and accountability, overall plan for sustainability and community health. The most progress made towards these questions came after established trust with mentors/coaches and a cohort and multiple synchronous visioning sessions. *We conclude that addressing the precarity of our digital infrastructure cannot be done with a prototype, a metric, or an asynchronous tool. It must be engaged as a question and iterative process of strategic visioning, design, and community accountability.* Support for the sustainability and maintenance of open source should carefully consider the ways in which technologists and scientists use existing resources and the conditions in which they most readily take risks and make meaningful changes.

## Addenda

### Public Event Recordings

**Building Laterally: Political Imagination to Support and Sustain Digital Infrastructure** was a series of virtual events open to the public hosted by the Digital Infrastructure Incubator at Code for Science and Society. The series connects the discourse on sustainability, governance, and community health in open source and digital public infrastructure to wider political horizons. Together these events draw out interdisciplinary resonances and invite participants to invest in the crafting of a political imagination to support and sustain digital infrastructure. The Digital Infrastructure Incubator hosts a cohort of open source project leaders as they work to address their sociotechnical infrastructure. Participants iterate solutions around governance models, community engagement and participation, and the building of cultural foundations to support the growth of dynamic open source across the globe. The program is part the Digital Infrastructure Fund, provided by the Ford Foundation, Alfred P. Sloan Foundation, Open Society Foundation, Omidyar Network and the Mozilla Open Source Support Program in collaboration with the Open Collective Foundation.

#### [Labor Across the Tech Ecosystem](#) | October 28, 2021

The last few years have seen an uptick in organizing among tech workers writ large. What can efforts to increase the sustainability of digital public infrastructure learn from these movements? What does "sustainability" mean to gig workers? What does it mean to employees in big tech or at startups? How is that the same or different from what it means in open source and digital public infrastructure? How to connect these struggles for sustainable work? Join a panel discussion with labor organizers and movement makers from across the tech ecosystem. Together their reflections offer new directions to push on and expand what "sustainability" means across the tech ecosystem. Speakers: Aerica Shimizu Banks (Pinterest whistleblower, founder Shiso) Clarissa Redwine (Collective Action in Tech, Oral History of Kickstarter United) Jennifer Scott (Gig Workers United, Foodsters United Co-op) Nataliya Nedzhvetskaya, moderator (University of California, Berkeley)

#### [Anti-Oppression Frameworks in Open Source](#) | December 10, 2021

We are increasingly seeing social justice language in mission statements, codes of conduct, grant proposals, and more in open source software and digital public infrastructure. The incorporation of anti-oppression frameworks into organizational governance and policies begs a reflection on the political processes behind this shift. As we have seen in other sectors at different points in history, radical frameworks born out of specific political contexts can become sanitized and depoliticized as they are applied more widely. As open source digital public infrastructure embraces anti-racist, anti-ableist, anti-colonial, and gender-affirming values and commitments, how can project leaders and community managers critically assess this work and the tools relied on to do it? As the urgency shifts in many organizations from the documentation of anti-oppressive values to considerations of their implementation or "enforcement," the question of

the political trajectories we are on becomes more important. Join a panel discussion with open source leaders, anarchist organizers, and community managers that explores the building of resilient community structures. Explore with them their experiences addressing harm and creating safety and revisit with them the radical roots underpinning today's social justice discourse. Panelists: Coraline Ada Ehmke (Organization for Ethical Source) Sydette Harry (Mozilla Rally) David Ryan Barcega Castro-Harris (Amplify Restorative Justice).

#### [Visions of Mutual Power](#) | January 22, 2022

Many open source public interest projects identify as do-ocracies - where contribution and participation guide a project's trajectory. For many, this structure holds a liberatory potential where seemingly low barriers to entry promise a future of diverse contributors working collaboratively to build open solutions. This panel asks: what kinds of power can do-ocracies and other models of collective governance build and hold? Panelists offer examples from open source digital infrastructure projects and from other movements that have mobilized the structure of mutual aid and other forms of collective action towards radical solutions to questions of community health, safety and inclusion, and sustainable work. Join us for a conversation that explores the link between project governance and the horizons towards which digital infrastructure projects strive. As conversations deepen around implementing distributed and transparent governance models towards more sustainable futures for open source projects, we zoom out to ask what visions drive efforts building and maintaining digital public infrastructures? How can work around project governance reflect and inform larger goals around resource redistribution, equality, and transformation of the commons? How to build power laterally towards a sustainability that coheres beyond grant seasons, beyond crisis response, beyond burnout? Panelists: Camille Acey (CoLET) Liz Barry (Public Lab) and Njera Keith (400+1)

#### [Coloniality of Digital Infrastructure](#) | March 15, 2022

We know that infrastructure is the stuff our lives run on - the roads and bridges of contemporary life. But digital infrastructure, like its material forebears, enables domination at the same time that it offers speed, efficacy, development. How does the building and maintenance of digital infrastructure further imperial domination, neocolonialism, and other forms of extractivism? Is it possible to build or maintain digital infrastructure outside of colonial histories and neoimperial realities? Join a conversation with those building digital infrastructure around the world that explores sovereignty, development, and the futures of digital infrastructure. Panelists: Chao Tayiana Maina, a co-founder of the Museum of British Colonialism and a co-founder of the Open Restitution Africa project. Luis Tayori is the director of the ECA Amarakaeri (The Executor of the Administration Contract of the Amarakaeri Communal Reserve).

#### [Practice of Digital Infrastructure](#) | May 9, 2022

In recent years, more and more attention has turned to the challenges of maintaining open software and infrastructure. Across the open landscape, resources and support for open source

project leaders are being published and offered. Behind the scenes and in between these resources, what does the practice of building transparent governance models, designing engaging community outreach, sketching models of scaling, growth, and finance look like for small teams behind experimental digital public infrastructure projects? Join a celebration of the first cohort of the digital infrastructure incubator at Code for Science & Society as they share out learnings from the past six months. Teams open their project notebooks to discuss approaches to governance, community engagement, and the practice of building cultural infrastructure. After lightning talks by project leads, we turn to the audience to further discuss the practices of building sustainably. Speakers: Batool Almarzouq, Saranjeet Kaur Bhogal, Tega Brain, Jackson Maxfield Brown, Stephan Druskat, Miquel Duran-Frigola, Alex Nathanson, Heather Turner, Gemma Turon, Nicolas Weber.

**Courageous Conversations** was a sequence of public events paired with the second cohort of the Digital Infrastructure Incubator. The third event featured the participating projects of the second cohort in a kind of “fail fair” that was not recorded.

[Governance! Or Whatever It Is We’re Trying to Do](#) | August 31, 2023

Political orientations show themselves in governance the way disdain can show itself in the pithy one liners of a southern belle—subtly. One’s mode of governance is found in how people share food, in whether people greet each other in a room, in the language they use to ask a question and determine who is worthy of being asked certain questions. In an era of rapid change and evolving societal clarity, it is essential to question and reimagine the traditional models of governance that underline the relationships between people who work on projects. Today’s discussions will explore both alternative social governance structures to “get things done” and diversions that do not merely replace, but direct us away from this culture altogether. Speakers: Amethyst Carey Janelle Orsi Parissah Lin Moderator: Miliaku Nwabueze.

[\[Open\] Sourcing Resistance](#) | September 11, 2023

Disruption has become all the rage in the tech world since the Silicon Valley boom. In line with trajectories of co-optation, the rhetorical realm of disruption moved from a thing one does to halt hegemonic forces of destruction to a characterization of new high-grossing tech companies. A disruptor has now become a VC-backed techie fomenting those same oppressive economic and political forces within which silicon valley disruptors thrive. In this discussion, we will explore lessons from the frontlines that open source and science ecosystems can use to reject the prevailing ethos of state and market backed tech and science. It is our hope to inspire folks to build tech that can directly deliver and hedge the power to disrupt back to the people.

## Public Resources

### [DII Essential Readings](#)

An incomplete list of things we have read, are reading, and are thinking with.

### [Governance Bibliography](#)

Selected resources for developing project governance.

### [Community Engagement Bibliography](#)

Selected resources for deepening community engagement.

### [21-22 DII Curriculum](#)

Skeleton of the programming and exercises used in the first cohort.

## Staff Bios

**Rayya El Zein, PhD** brings a global, justice-centered perspective to philanthropy, public policy, and community-led institution building. She works with technologists, artists, and researchers to imagine and build flexible infrastructures to support their work. She holds a PhD in Theatre and Performance from the City University of New York.

**Joe Hand** is an expert in strategic and operational development for communities addressing global challenges faced by community-led projects working with data and technology. He serves as Senior Director of Operations at Code for Science & Society and also holds an acting Officer position. Since 2018, Joe has led CS&S's operational growth from two employees and \$400k in annual revenue to a budget of over \$15 million and 50 employees. Joe has experience leading global open source projects as a developer.

**Angela Okune, PhD** brings over 12 years of experience in community engagement in open data and scholarship ecosystems to CS&S. A social scientist of science, Angela received her doctorate in Anthropology from the University of California, Irvine. Formative experiences include establishing a research and data science team at the first African tech hub (2010-2015); co-running the [Open and Collaborative Science in Development Network](#), and co-editing the open-access book [Contextualizing Openness: Situating Open Science](#) (University of Ottawa Press).

**Miliaku Nwabueze, MFA** is an anti-disciplinarian constellation architect, chaos orchestrator, and glitch enthusiast who splits her time between New York and Atlanta. She is a queer, Igbo-Black American originally born and raised in Detroit who writes, designs, and wonders. You can follow her portfolio at [www.miliaku.com](http://www.miliaku.com).

**Danielle Robinson, PhD** is a strategic advisor to communities innovating in technology, research, and open source. In 2016, she completed a PhD in Neuroscience at Oregon Health & Science University, during which time was a NSF Graduate Research Fellow and advocated for policies that supported open access on campus. As a 2016 Mozilla Fellow for Science, she ran open source project management workshops around the world, and explored decentralized approaches to data preservation. She is Executive Director of Code for Science & Society.