Maintainers III: Policy, Practice, and Care
October 6 – 9, 2019
Kellogg Conference Center & Hotel at Gallaudet University
Washington, D.C.

A summary report

Written by The Maintainers co-directors:
Jessica Meyerson
Andrew Russell
Lee Vinsel
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Executive Summary

This report details the planning activities and outcomes for *Maintainers III: Policy, Practice, and Care*, a conference that took place on October 6-9, 2019 at the Kellogg Conference Center & Hotel at Gallaudet University in Washington, D.C. The Alfred P. Sloan Foundation was the largest supporter of the conference; other sponsors included APIdays, ANSI, UpKeep, Fiix, and the Rockefeller Archive Center. In this seven month project the co-investigators planned and convened a conference that brought together practitioners, policy-makers, researchers, and activists who have deep engagements with maintenance; developed and helped to sustain communities in specific maintenance contexts; and contributed to a broad public movement around the importance of maintenance and maintainers in modern life. We sold 223 tickets for Maintainers III (with net sales of $32,703.76) and featured over 100 speakers in 50 sessions. The success of the conference is evidenced by increased conference participation by self-described practitioners; deeper engagement both within and across maintenance communities; and documented commitment to future participation from existing and new members of the Maintainers network.

Acknowledgements

As all of you know, hosting a conference is a considerable undertaking. Therefore, the success of the event hinges on the contributions of many individuals and organizations. The Maintainers co-directors are endlessly grateful and consistently humbled by the investment of time, creativity, and thoughtfulness all of the people that helped to make Maintainers III a safe and meaningful event. These people include proposal submitters, attendees, members of the broader Maintainers network that helped to spread the word, sponsors, program committee chairs, speakers, keynote speakers, and conference staff.

In addition to serving as a source of community cultivation expertise¹ Educopia Institute² served as the fiscal sponsor for Maintainers III, providing their legal and tax-exempt status as well as their accounting infrastructure to the Maintainers in order to process revenues and expenditures associated with the conference.

Sponsors³

Maintainers III would not have been possible without the support and generosity of our sponsors:

**The Alfred P. Sloan Foundation⁴** makes grants primarily to support original research and education related to science, technology, engineering, mathematics, and economics. The Foundation believes that a reasoned, systematic understanding of the forces of nature and society, when applied inventively and wisely, can lead to a better world for all.

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¹ Community Cultivation - A Field Guide: [https://educopia.org/cultivation/](https://educopia.org/cultivation/)
² Educopia Institute - Home: [https://educopia.org/](https://educopia.org/)
³ Maintainers III - Sponsor Resources: [http://themaintainers.org/miii-sponsor-resources](http://themaintainers.org/miii-sponsor-resources)
⁴ Alfred P. Sloan Foundation - Home: [https://sloan.org/](https://sloan.org/)
API Days⁵ is the world’s leading API conference series. The mission of API Days is to democratize and evangelize the opportunities and the use of APIs for corporations and businesses.

Fiix⁶ provides easy-to-use, affordable maintenance management software to the world in order to reduce waste and protect investments in infrastructure.

Rockefeller Archive Center⁷ preserves and makes available for research the archival collections of the Rockefeller family and associates through a transparent and standards-based approach, contributing to open-source systems and communities; and publishing policies and workflows openly online.

American National Standards Institute (ANSI)⁸ is a private, not-for-profit organization committed to enhancing the global competitiveness of U.S. business and quality of life. They advance this mission by providing a framework for fair standards development and quality conformity assessment systems, and safeguarding the integrity of those systems.

UpKeep⁹ designs maintenance management software intended to make life easier and to empower maintenance teams to make better decisions from data-driven insights. They believe that we can transform maintenance culture from reactive to preventative if we can make management of maintenance work easier and lower maintenance costs.

Program Committee

We are forever indebted to the members of the MIII program committee for their significant contribution of time, thoughtfulness and creativity. From ideation to implementation, the program committee members ensured that the call, review, selection, and scheduling of proposals for each track were all informed by a combination of domain expertise and commitment to Maintainers values.

Information Track

Hillel Arnold is Assistant Director, Head of Digital Programs at the Rockefeller Archive Center where he leads implementation and maintenance of open-source systems and processes facilitating broad and equitable access to and responsible preservation of archival records. He is active in standards making and maintenance bodies, and has served on the Society of American Archivists’ Technical Subcommittee on Describing Archives: A Content Standard (TS-DACS), and Encoded Archival Description Roundtable. In his role as co-chair of the information track, he works to include the voices of a diverse set of information maintainers in the conference.

Juliana Castro is a Colombian, New York-based graphic designer and writer interested in design ethics, open-access, and media theory. Juliana is the Design Associate at Access Now, where she helps a global advocacy team fight towards the respect of human rights online and procure a free and open internet for all. She is also the founder of Cita, an independent feminist publisher of free open-access books. Juliana hopes to bring into discussion the role of interfaces and interaction design in caring for information maintenance.

⁵ API Days - Home: [https://www.apidays.co/](https://www.apidays.co/)
⁶ Fiix - Home: [https://www.fiixsoftware.com/](https://www.fiixsoftware.com/)
⁷ Rockefeller Archive Center - Home: [https://rockarch.org/](https://rockarch.org/)
⁸ American National Standards Institute (ANSI) - Home: [https://www.ansi.org/](https://www.ansi.org/)
⁹ UpKeep - Home: [https://www.onupkeep.com/](https://www.onupkeep.com/)
Chela Scott Weber currently works as a Senior Program Officer for the OCLC Research Library Partnership, where she builds and maintains relationships, resources, and programs across an international collective of research libraries. She has previously held a number of positions in archives and special collections libraries, including Head of Library and Collections at the California Historical Society and Associate Head for Archival Collections at the Tamiment Library & Robert F. Wagner Labor Archives at NYU. In her role as co-chair of the information track, she hopes to encourage a broad array of information maintainers to reflect on their work and encourage a view of information maintenance work as worthy of reflection.

Transportation Track

Tabitha Decker is the Deputy Executive Director at TransitCenter, a foundation that works nationally to improve transit in ways that make cities more just, and environmentally and economically sustainable. Tabitha is one of the leaders of the Bus Turnaround Campaign, a coalition effort that successfully advocated for better bus service in NYC, securing commitments from the transit authority and mayor to radically improve bus speeds and reliability. As co-chair of the transportation track, she is focused on incorporating the perspectives of advocates, practitioners, and those who are most affected by our uneven and ill-maintained transportation system.

Raquel Velho is assistant professor at the department of Science & Technology Studies at Rensselaer Polytechnic Institute. She is a sociologist of technology, and works at the intersection of infrastructure studies and disability studies, often informed by Latin American approaches to the field of STS more broadly. Her primary research has focused on issues of transport accessibility for disabled people, researching how users’ voices are (or aren’t) included in the process of technological and infrastructural development. As co-chair of the transportation track, Raquel hopes that she can trouble the innovation/maintenance divide in ways that reflect the practices of everyday users.

Carole Voulgaris is assistant professor at the department of Civil and Environmental Engineering at California Polytechnic State University. Her research interests include travel behavior, alternative modes of transportation and transportation finance. She teaches courses in Transportation System Planning, Sustainable Mobility, and Public Transportation. Carole is Advisor to the Institute of Transportation Engineers. As co-chair of the transportation track, she is interested in facilitating discussions around maintenance of critical transportation infrastructure.

Software Track

Don Goodman-Wilson is a philosopher-engineer based in Amsterdam. His focus is on empowering software developers, and especially open-source software maintainers by helping them identify the best tools, and best practices for their craft. In previous lives, Don has worked with startups in such diverse fields as web security, chatbots, streaming media, embedded hardware, the model railroading industry; he also holds a Ph.D. in philosophy from Washington University in St. Louis. Don is also the founder of the DevRel Salon, a European-wide series of events designed to help individuals and companies understand the value of developer relations as a role and career path.

Mehdi Medjaoui is the CEO of Progressive Identity, a company enabling users to get back their data from digital platforms and redistribute them to others with the identity they want: their alias(es). In 2012, Mehdi created APIDays conferences, the main series of Conference on APIs (still running in 2019 with 9 events) and has been the co-founder of OAuth.io, a developer backend to handle application authorizations (acquired in 2017 by Xenon Ventures). Since 2015, Mehdi publishes every year the Banking APIs : State of the market...
report, and just published his last book Continuous API management with its fellow API academy members, published by O’Reilly.

**General Track and Steering**

**Shannon Mattern** is a Professor at the New School for Social Research. Her writing and teaching focus on archives, libraries, and other media spaces; media infrastructures; spatial epistemologies; and mediated sensation and exhibition. She is the author of The New Downtown Library: Designing with Communities; Deep Mapping the Media City; and Code and Clay, Data and Dirt, all published by University of Minnesota Press. She contributes a regular long-form column about urban data and mediated infrastructures to Places Journal, and she regularly collaborates on public design and interactive projects and exhibitions. You can find her at wordsinspace.net.

**Jessica Meyerson** is Director of Research & Strategy for Educopia Institute, co-director of the Maintainers (with Lee Vinsel and Andrew Russell) and PI on the *Maintainers III: Policy, Practice and Care* conference grant awarded by the Sloan Foundation. Jessica works across organizations and sectors to support applied research that advances community health. She currently participates in several projects aimed at broadening participation in digital curation and the open knowledge movement. As a member of the Maintainers III Steering Committee, Jessica oversees conference staff, volunteers, program logistics, budget, timelines, communications, and overall attendee experience.

**Andrew Russell** is Professor of History and Dean of the College of Arts & Sciences at SUNY Polytechnic Institute in Utica and Albany, New York. He is the co-founder (with Lee Vinsel) of The Maintainers, a network of scholars and professionals focused on maintenance, repair, upkeep, and the everyday labor that keeps the world going. Russell is the author of Open Standards and the Digital Age: History, Ideology, and Networks (Cambridge University Press, 2014), co-editor of Ada’s Legacy: Cultures of Computing from the Victorian to the Digital Age (Morgan & Claypool, 2015), and has published essays on Internet history, modular design, standardization in the United States and Europe, and the monopoly Bell System. As a member of the MIII Steering Committee, Andy works on program logistics, content, and bringing together people from diverse backgrounds who are passionate about maintenance.

**Lee Vinsel** professes Science, Technology, and Society at Virginia Tech. He is the co-founder (with Andy Russell) of The Maintainers, a network of scholars and professionals focused on maintenance, repair, upkeep, and the everyday labor that keeps the world going. Lee is the author of Moving Violations: Automobiles, Experts, and Regulations in the United States (Johns Hopkins University Press, 2019) and articles on the history of technology, standardization, and public policy. As a member of the MIII Steering Committee, Lee focuses on program logistics, and he is also proud to be helping the transportation track leaders in their efforts.

**Conference Staff**

Juliana Castro was responsible for designing a set of extensible design assets that extended the Maintainers visual identity and also provided sufficient visual distinction between each of the conference tracks. Juliana designed the name badges, program schedule, social media graphics, floor map, stickers for participants to self-identify, consistent styling for Sched, and wayfinding signage for Maintainers III.
Bernardo Hidalgo created illustrations inspired by the proposal abstracts submitted by authors and presenters. MAMA’s illustrations are used in sections of this report and will be featured more extensively in a companion publication scheduled to be released in 2020.

Several Educopia Institute staff played critical roles in the successful execution of Maintainers III. Donald Westbrook, former Project Coordinator for the Sustaining Maintenance Communities grant organized the program schedule in Sched, provided ongoing logistical support for speakers and the program committee members, and managed applications for the Fiix Travel Scholarships. Nancy Adams helped to manage communications with Kellogg staff regarding on-site conference needs, oversaw the sponsorship workflow, made updates to the conference website including the Accessibility FAQ, and handled ordering and shipping for conference supplies. Nance also worked the registration table most days of the conference, providing on-site registration assistance and information about how to navigate the conference including where to sign-up for dine arounds. Caitlin Perry also helped to manage communications with Kellogg staff, particularly in regards to catering and invoicing. Caitlin processed all revenue and expenditures associated with the conference and handled all of the travel arrangements for conference keynotes and staff. Katherine Skinner served as an external adviser to the conference team, providing advice and feedback and key points in the planning process.
Themes

The enthusiastic discussions at Maintainers III touched on innumerable topics and concerns. The meeting was organized into four distinct tracks—Information, Software, Transportation, and General—with plenary sessions that established a shared agenda and sense of purpose. The conference program, goals, code of conduct, and other details are available on our website, http://themaintainers.org/miii. With the use of meeting notes from the event, generated from track chairs and conference attendees themselves, we were able to identify four high-level themes: Maintenance, Maintainers, Ecosystems, and Research. Each theme is illustrated using examples taken directly from session-specific discussions. The following section includes reflections on planning and preparation, and an overview of outcomes and lessons learned. Finally, we outline future directions for Maintainers events.

MAINTENANCE: Maintenance is deeply connected to Power, Governance, and Representation

Many of the presentations and conversations at MIII—some of which have been published online10—examined how maintenance connects to systems of power and social hierarchies. There is an uneven distribution of infrastructure and maintenance, often dictated by long-standing patterns of economic, social, and cultural privilege. This theme was prominent in all of the keynote presentations. For example, Deb Chachra—in her keynote address with Mel Gregg—described a global “infrastructural aristocracy” of people who have access to infrastructural systems.11

Several papers and conversations also touched on how to govern public and collective maintenance projects, such as a session in the Transportation Track featuring Tabitha Decker, Dara Baldwin, Ron Thompson, and Raquel Velho entitled “Maintaining Public Transit for All: Addressing Bias in Safety and Access.”12 In a session on open source software with Benedict Kingsbury and Thomas Streinz, presenters provided examples of community organizations successfully overseeing maintenance.13 In others, however, such as a presentation about green infrastructure from Amanda Philips de Lucas,14 community groups were shown to be short-lived and ineffective, leading to the failure of maintenance initiatives in the medium-to-long term. One major upshot of the “Mowed Over” workshop—a simulation game about governing community spaces held in the General Track and created and facilitated by Ben Helphand, Gia Biagi, and Laura Lawson—was the importance of adopting models of community governance that respond directly to local contexts and needs.15 Meanwhile, Chuck Marohn of Strong Towns argued in his keynote address that turning to community groups for public

infrastructure maintenance is a mistake, and that the responsibility properly rests with local governments. Exploring appropriate governance models for maintenance might be a fruitful topic for a future Maintainers conference or workshop.

**Image:** MAMA illustration inspired by Alice Goldfarb’s paper proposal entitled “Done, if by Sea: Consequences of the Potential End to the Alaska Marine Highway System.”

**MAINTAINERS:** Examining maintenance highlights how this form of work connects to long-lived status hierarchies, including those around identity categories such as race, class, and gender.

Participants in the Information Track’s “Interrogating the Ethic of Care in Information Maintenance” panel discussed the ways in which information infrastructures perpetuate systemic inequities as well as ways in which current information organizations are addressing these inequities. Historian James Longhurst, speaking in the Transportation Track, described how the work of “meter maids”—often done by underpaid minority women—represents a form of maintenance labor. In the General Track panel entitled “Labor: Maintainers at Work,” Stephanie Hoopes, National Director of United Way’s ALICE program, described early research on how the vast majority of people who meet the definition of ALICE (Asset Limited, Income Constrained, Employed)—a measure of working people who face financial hardship—work in Maintainers roles.

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17 The illustration features Alaska governor, Mike Dunleavy, describing his budget proposal to end the state ferry service known as the Alaska Marine Highway System. The proposal disproportionately affects communities that are not on the road network and do not have access to affordable transportation alternatives that would allow them to access public education, healthcare, and other basic services.


Some talks put forward visions for how to improve the cultural ways in which individuals perceive maintainers. In his keynote, Chuck Marohn, the founder and president of Strong Towns, said, “If maintenance is the priority—and it must be the priority—then the people who perform maintenance must be a priority. That’s a different culture, one where the maintenance worker is a value-adding artisan, not the lowest-cost cog in a bigger system.” Laura James, one of the founders of the UK-based Festival of Maintenance, argued that the goal should be to ennoble maintenance—that is, to elevate the work in degree, excellence, and respect and to view it with the dignity it deserves.

**ECOSYSTEMS:** Thinking about maintenance requires a holistic approach that frames the subject not only in terms of systems but also entire ecosystems of interaction.

Conversations repeatedly called for interdisciplinary and cross-sector conversations and learning, including business, government, academia, and nonprofit organizations. Papers in the Transportation Track pointed out that solutions to transportation-scale problems often require broad circles of expertise. For

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21 The illustration features a crew of lighthouse maintainers on their way to a lighthouse. The lighthouse maintainers possessed mechanical ability and were faced with maintenance challenges that resulted in lighting innovations that were never recognized as such. Lacking formal engineering education, lighthouse maintainers were used as pawns in a political debate over control of the United States Lighthouse Establishment.


instance, historian Gerard Fitzgerald, speaking in a session on “Lifecycles of Infrastructure,” described how solutions around persistent water problems in the railroad industry draw on chemists as well as engineers.  

A frequent theme was the balance and tradeoff between capacity and impact, on the one hand, and scale and growth on the other. In the Information Track, presenters in the “Reconfiguring Archives” and “Information Maintenance in Archives” sessions argued that library and information collections need to reflect existing organizational capacities, not the other way around. Building collections beyond capacities on the assumption that more people will be hired down the road leads to deferred maintenance and stressed maintainers. In her keynote address, Mel Gregg pointed out that, through digital systems and shared files (such as Google Docs), individuals are increasingly working in public, with the result that overburdened workers feel the need to perform beyond their actual responsibilities. Chuck Marohn examined how US infrastructure policy incentivizes municipalities to take on infrastructural debt that far exceeds their maintenance capacities. This topic also was raised frequently in the Transportation Track, since transportation users are promised better service through system growth, but find that this growth can increase maintenance burdens and lead to degraded service.

Members of the Maintainers network have increasingly called for examinations of moments where maintenance transitions into senescence and decay. Nothing lasts forever. Thinking through maintenance requires us to consider when we should cease caring for things and discontinue them. In the Information Track, for instance, Este Pope described situations where software and digital repositories are being phased out or replaced. A panel on “Impermanence,” organized by Sabir Khan and featuring Jamie Ready and Roy Decker, reflected on the tendency of architects to focus on the design and construction phases, in contrast to the work of facilities maintenance and repair teams that are responsible for fixing ageing buildings. In his keynote, Chuck Marohn of Strong Towns described how municipalities that are deeply underwater financially will need to carry out painful processes of “triage” in order to decide which neighborhoods to save and which neighborhoods to let go and eventually raze. In addition, sessions in the Software Track, such as “Unruly Bodies of Code in Time” and “Building a Bridge to a Legacy Application,” explored the challenges of maintaining and making use of code and software past their prime.

Finally, we were struck by how often the topic of **modularity** came up, opening an avenue of inquiry for the community. Modularity is considered a key factor in supporting resilience in ecosystems and enables incremental improvements to the system—that is, you can make small changes to one component in the system rather than making global changes to the entire system. However, modularity also presents challenges for maintenance because discrete components of the system may require maintenance at different points in time, and relationships between discrete components can be lost or compromised when modular systems are transferred from an active use to a reuse context, as in the case of software preservation (something explored in the Information Track’s panel “Software Curation: Intersection of Policy and Practice”). Graduate student Danielle Bovenberg gave a talk on how modularity has impacted the production and use of scientific instruments. Modular design has also become popular in heavy industry as a way to make maintenance and repair more efficient.

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34 The illustration features an equipment technician maintaining nanoscale processing tools of different generations in a materials science laboratory. In order to provide ongoing maintenance on a broad range of equipment still in use today, technicians have to take a strategic and modular approach to equipment modifications.


RESEARCH: Conversations also focused on the need for further research, including expanding the types of methods and data being drawn upon.

In all professional fields and conference tracks, we see people eager for more research and better data to inform discussions and decision-making. The need is especially acute where maintenance has been neglected or taken for granted; indeed, one outcome of neglect is a lack of knowledge. For example, in the “Maintainers at Work” panel in the General Track, Katie Wells, a researcher at Georgetown University, argued that a “lack of research is impeding our ability to create policy to support Maintainers,” and Stephanie Hoopes of United Way’s ALICE project described her efforts to create a better measure of financial hardships, which, in turn, opens up new research questions. Extremely basic questions often remain unanswered: Roy Decker, an architect who took part in the “Impermanence” panel, pointed out that we lack basic measures of the costs of building-related maintenance on different timescales. And the “Right to Repair and the Circular Economy” panel highlighted how we lack information on several fundamental topics, from how numbers of local repair shops have changed over time to the environmental impact data for e-waste and recycling.

The ecosystems theme and its implications for a truly interdisciplinary discussion have been proven in previous Maintainers events. However, what was much clearer during the Maintainers III conference was the interest in seeing the mixture of methods and perspectives applied to an empirical understanding of a particular maintenance concept. For example, in the General Track, there was a discussion about the need to include more economists and engineers in the network’s conversations.

Several conversations focused on how better data and, importantly, shared measurement can lead to better alignment and collective decision-making. Holistic, maintenance-aware framing for major social challenges is only effective if there are several key points of alignment, including tracking disparate activities and goals towards a set of broader, consensual goals and objectives. Several conversations focused on how the Maintainers network needed to begin creating shared measurement tools.

Reflections on process, content, and structure

Maintainers III planning began in earnest in January 2019, which greatly accelerated the timeline of completion for conference activities. Maintainers co-directors began the process by writing the call for proposals and used that as the basis for planning committee member invitations. The first monthly planning committee meeting was held in February. All conference planning documentation was accessible to all members of the conference planning team. Monthly planning committee meetings were supplemented with weekly co-director and staff check-ins. A master planning spreadsheet, organized into tabs for discrete planning activities, was the primary

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source for information regarding budget, programming, and contact information. With the entire nine-month planning runway now in clear view, (drawing directly from documented participant feedback, planning committee meeting notes, and post-event retrospectives with staff and volunteers), organizers have identified clear takeaways to be incorporated into planning in interprofessional and interdisciplinary spaces:

- **There are many reasons for a planning committee design that works across disciplinary and professional siloes.** Our track chairs were uniquely positioned to understand and select proposals submitted to their track, and to weave together threads of discussion within their track in the form of curated panels. In the future, we will continue to identify people that represent different maintenance contexts but we will organize the work of planning and programming in order to encourage strong connections and discussions around themes common across maintenance contexts.

- **When we have a choice between additional dedicated staff, and additional volunteers, we need to weigh this choice very carefully.** Paid staff were essential to the success of the event, particularly within the four month time window. However, even with their assistance (.6 FTE total), the conference would not have been successful if the planning committee had not been willing to serve as both the program committee and on-site volunteer staff in each of their tracks. Volunteer opportunities during Maintainers events are an effective way to empower community members to shape the discussion and the culture of the conference more directly. While we were tempted to recruit additional volunteers for on-site assistance with moderation, timing, and note taking, the coordination of a team of additional volunteers presented challenges. For instance, lacking a set of existing tools or workflows for managing a larger team of volunteers, coordination was time-prohibitive for all members of the paid conference staff and planning committee. One way to create capacity for additional volunteer opportunities during future events is to identify discrete, self-contained sets of work that people can sign up for and complete on a rolling basis (such a list could easily be derived from the Maintainers III meeting notes and task lists). Another way to create capacity for volunteer opportunities is to create roles on future planning committees that correspond to conference functions in addition to content. Establishing roles would include clearer expectations about which aspects of the conference planning committee members are responsible for, and make room for a Volunteer Coordinator role that would focus on processes and workflows for coordinating ad hoc, discrete tasks undertaken by volunteers.

- **The visual identity of the conference was critical for a coherent program and a user-friendly experience.** Juliana Castro⁴¹ was contracted to update the visual identity for the Maintainers, design the *Information Maintenance as a Practice of Care* paper,⁴² and create promotional materials and wayfinding signage for the Maintainers III conference. The concurrent nature of this work allowed the development of flexible and easily recognizable branding system that reinforces the reciprocal and iterative relationship between Maintenance Communities and the Maintainers network at-large. Together with illustrations of specific maintenance activities (inspired by the conference proposal abstracts) created by Bernardo Hidalgo of MAMA⁴³, the visual identity of the conference will extend beyond Maintainers III and continue to develop, reflecting changes to the culture and activities of the Maintainers network.

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⁴¹ Juliana Castro - About, [http://julianacastro.co/](http://julianacastro.co/)
⁴² *Information Maintenance as a Practice of Care* (on Zenodo): [https://zenodo.org/record/3251131#.XgEeXEdKiiN](https://zenodo.org/record/3251131#.XgEeXEdKiiN)
• Inclusion and accessibility should continue to be central to the culture of Maintainers events, which means inclusion and accessibility have to be considered an essential component of event budget planning. We have to be clear about which inclusive practices we choose to prioritize when decisions have to be made about finite resources. While accessibility was at the forefront of planning committee discussions from the beginning, we did not budget appropriately to cover accessibility services that may have been necessary to facilitate a meaningful experience for attendees. Additionally, we asked whether attendees would require accommodations such as sign language interpretation, but only in the registration form. In future events, we will account for accessibility and inclusion costs upfront as an estimated percentage of the total conference costs. We will also be sure to inquire about specific attendee accessibility needs in the initial call for proposals, so that speaker/presenters accommodations are accounted for as early in the process as possible.

• Less waste still costs more. Sustainability and maintenance are a Venn diagram illustrating the shared emphasis on making things last, honoring the craft inherent in that activity and considering the needs of ourselves and our environment across time. As such, we have a responsibility to the members of the Maintainers network to embody these priorities and values in our consumptive practices for Maintainers events. However, one takeaway from Maintainers III is that sometimes less waste costs more; this was especially true for catering, which represents one of the most if not the most significant conference costs. Regular plastic name badges and sleeves cost far less than compostable name badges and are non-reusable. We opted for compostable badges and would do this again for future events.

Energy and waste savings is an area of expertise represented within the network, and for future Maintainers conferences we would like to enlist members to think more creatively about ways to lower energy and waste consumption, including experimentation with virtual conference models such as the Nearly Carbon Neutral Conference Model developed at the University of California, Santa Barbara. Moreover, as global society grapples with the challenges of the COVID-19 pandemic, virtual conferences also are necessary from a public health standpoint.

Additionally, organizers reflected on the stated Maintainers conference themes and objectives to determine how comprehensively the program engaged those themes and objectives. Our largest attendance goal was to continue shifting the conference from one primarily attended by academics and researchers to one attended by practitioners. We set a goal of having 50% practitioners (as opposed to researchers) and we exceeded this goal: 43.8% of attendees identified as practitioners, while only 35.6% identified as researchers. Other self identified designations and their rate of attendance includes students (11.4%), sponsors (4.6%), and other (4.6%). Most attendees came from the US, with a handful from Australia (2), Canada (1), Switzerland (1), Germany (1), and Great Britain (1). Of the 68 attendees who responded to the feedback survey, 89.7% of attendees had never attended a conference of this nature before.

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45 To clarify, we don’t always have to choose. Before making a choice, we should ask how we might accomplish an inclusion goal without hiring a contractor. Following on from the example provided in the paragraph, one Maintainers III participant (who is also a working mother and attended with her young child) suggested a Little Maintainers or child track would be a great way to instill Maintainers values in a new generation and open up conference participation to primary child caregivers. The same participant also suggested that the track could be run by volunteers - parents that are willing to take shifts and develop actual programming for the children participating.


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attended a Maintainers-related event before, which means we are continuing to draw new individuals into the network.

Although “policy” was one of the themes of the conference, gauging our growth into the policy domain as a result of Maintainers III has proven more challenging. Most, if not all, sessions addressed policy to varying degrees. The panel moderator for “Labor: Maintainers at Work” asked panelists to explicitly address the ways in which research should inform practice and vice versa.\(^{47}\) However, these discussions fell short of mapping out clear next steps for maintainers that want to inform policy or apply new/existing research to a policy issue. While our reasoning for hosting the event in Washington, D.C. was centered on attracting “policymakers,” we did not provide potential participants with a working definition of “policy”, specific examples of contexts in which policymaking activities are being carried out, a keynote speaker that would draw policymakers, and (most importantly) an explicit request to tie their session proposal to a specific policy or set of policies that affects or is affected by the maintenance phenomenon they discuss in their proposal. Despite (and perhaps because) of the fuzzy (but prominent) role for “policy” in MIII sessions, participants steered towards discussions about the types, access, and quality of data needed to shape policies in specific maintenance contexts. These data needs require further elaboration (possibly a community call for clarification on the Maintainers list) but represent a valuable outcome from MIII that will inform the Maintainers research agenda. In addition to providing more guidance for potential attendees and asking for more explicit ties between conference themes and the proposals, we will design more structured interactions between participants - interactions more likely to result in interventions, roadmaps, research questions, and other documented, actionable next steps.

Additionally, while the conference program design was effective at identifying and parsing out themes within specific maintenance contexts, attendee feedback consistently indicated a desire for more structured engagement across tracks. One attendee nicely encapsulated the conflict felt by other attendees:

> “I am a software engineer, and found the information and general talks to be of particular interest to my field (there are a lot of parallels) but also felt obligated to go to my own track more than I might have wanted. Perhaps re-aligning along different tracks e.g. career development and labour practices, historical stories & lessons learned, research areas, etc. might assuage some of this conflict I felt?”

With the exception of cross-track sessions (i.e. the plenary keynotes and track report-outs on Wednesday), scheduling presented a challenge to attendees interested in floating between tracks. First, the timing for sessions in the different tracks only aligned for plenary sessions. Outside of plenaries, breaks and meals, we did not require track chairs to align their session blocks. Since Maintainers III was the first Maintainers conference with a planning committee made up of track chairs, we wanted to give the track chairs significant autonomy in how they organized their tracks. Additionally, the planning committee optimized programming around track-specific themes described on the conference website\(^ {48}\) as well as a shared desire to include as many presenters as possible. In retrospect, the number of talks and speakers on the schedule was maximized at the expense of audience discussion with speakers and with one another.


Organizers sent a feedback form to all attendees in the week following the conference. Results from the feedback form revealed that 94% of feedback survey participants agreed that the conference met their expectations, and 50% of attendees rated overall satisfaction as “very satisfied.” 92.6% of attendees said they would plan to attend a future Maintainers event, and 45% said they were “very likely” or “likely” to recommend the conference to a friend or colleague. Given that the vast majority of Maintainers III attendees were first-time attendees, we believe this is a significant indicator of success.

Many of the attendees that completed the feedback form had concrete suggestions for how to improve cross-track discussion. One attendee commented that “the track-by-track readback session on the last day was excellent, but could be scaffolded throughout the conference.” Another attendee suggested a “braided” concept “i.e., in any given time slot, only TWO of the three threads are active, so participants are encouraged to do that intellectual cross-pollination.” One suggestion referred upstream to the call for proposals, suggesting that we could ask “how papers speak to the following xxx questions. And then, at the conference, asking folks to dialog around certain overarching questions, looking for points of connection and looking for some kind of actionable steps, etc.”

On the topic of unrealized potential in convening a mix of practitioners and researchers, one attendee asked if “there are ways to construct specific problem-solving sessions with academics and industry people?” Outside of the formal session programming, remaining suggestions for leveraging the mix of perspectives focused on providing more structure to foster informal interactions and potential ways to expand volunteer opportunities. For example, one attendee remarked, “I would have loved additional semi-organized opportunities to meet people and network outside of the main conference events...Perhaps in [the] future you could solicit volunteers from the Maintainers community to help set up this kind of event (I know there was the dine-around option, but perhaps that needed a bit of extra nudging or more formal inclusion on the program).”

**Future Directions**

Larger, in-person events such as conferences provide a unique experience not easily replicated in virtual environments or smaller gatherings, but we are actively researching alternative ways of convening and energizing participants in and outside of the network. Given the distributed nature of Maintainers and trends in event planning that leverage advanced features of web conferencing platforms (e.g., breakout rooms), we want to enact a virtual conference model that broadens participation, lowers costs, and provides a clear mechanism for localized conversations to feed into a set of broader program themes. Inspired by conferences such as the Society for Cultural Anthropology’s #displace conference, we could experiment with a hub and spoke model consisting of in-person, regional meetups that are in conversation with a virtual conference program. We could develop a blueprint for regional meetups (or “maintenance nodes”), including a set of discussion prompts, timing for break-outs to discuss reactions to invited speakers, and other tools. This model may also result in better documentation of discussions that take place during the event because it is inexpensive to record sessions.

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in the web conferencing platform and questions and comments may have to be submitted in writing in advance or posted to participants within a chat box.

Appendices

Appendix A: Final consolidated Maintainers III Track Session Notes:


Appendix B: PDF of Maintainers III Printed Program Schedule