

## Power and Precarity: Lessons from the Makers by Mail Project

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### Abstract

This article examines notions of precarity within the Makers by Mail project to interrogate the relationship between minimal computing methodologies and academic austerity. Doing so pushes us to reconsider the question “What do we need?” to center not only technological tangibles but also human(e) requirements for effective and ethical engagement. While this piece focuses on Makers by Mail, we hope our experience can bring attention to the ways in which precarity operates and is operationalized by individuals and institutions to reinforce traditional notions of power, limiting opportunities for marginalized peoples and groups. We hope that our experiences offer insight into the lives of precarious digital humanists, and that they continue pushing our field to reconsider when and how we support digital scholars and their projects. There are many ways to push against precarity in digital humanities — providing better contracts, paying higher wages, offering funding opportunities, developing mentorship networks, giving appropriate credit, supporting career growth, and promoting structural change. Any of the above can help shift our work away from precarity and toward praxis — working with and supporting communities. While minimal computing methodologies can help us alleviate some of the structural inequalities within higher education, we cannot achieve maximum justice until we address the problem of precarity within our own communities.

Making is a fraught process. As Dave Gaertner notes, the maker movement is “deeply rooted in the colonial heteropatriarchy,” favoring activities that result in increased capital — the development of technical skills and the production of new technologies, rather than the relationships between makers and their communities [Gaertner 2019]. So, how can digital humanities — a field deeply invested in maker culture — develop strategies for people-first approaches to technology? 1

Makers by Mail, a project launched in 2016, was developed as a people-first approach to making. Inspired by projects like the DHMakerBus, as well as the fields of public humanities and, more recently, digital community engagement (DiCE), we sought to develop a maker community that “leverage[d our] knowledge of the digital as a tool of community building” [Wingo et al. 2020, 14] [Hsu 2016]. Aware that “[t]he standpoints of the marginalized, the knowledge that is generated from their unique and particular social locations, thus offers important epistemological resources in any quest to create a more just world,” we sought to build a making community responsive to the needs and positionalities of our users [Eubanks 2011, 148]. We cite Virginia Eubank’s *Digital Dead End* specifically because, like Makers by Mail, it challenges the construct of the “digital divide” by promoting community-engaged technology praxis based on active listening, “a process that repositions expertise” as belonging to the user rather than a project developer or institution [Boyles 2020]. 2

Makers by Mail accomplished these goals by developing a new maker infrastructure — one that sent makers materials directly to users and that developed kits and teaching materials based on their needs and feedback. Specifically, Makers by Mail shipped technologies to community partners via Priority Mail, a consistently-priced and relatively low-cost shipping option. Partners only incurred the cost of shipping, plus the value of any lost or damaged parts. As such, participants gained access to fabrication technologies without having to incur costs for purchase or maintenance. Sample lesson plans were shared along with the technologies; however, user-developed designs and lesson plans were encouraged. In particular, the project encouraged participants to share their creations with the Makers by Mail 3

community by posting them to our blog and/or teaching commons. These user-developed projects and lesson plans helped us better understand the needs of our both our local users — public libraries, educators, and individuals in Iowa — as well as our digital humanities community: educators and scholars committed to interrogating “ideologies and environments for who gets to make, who can maintain, and who must source” [Sayers 2017, 9].

Questions about power and belonging are not incompatible with the maker movement. As Emily Chang, Joy Rankin, and Melissa Terras have noted, perceptions about who should make are often limited to those backed by powerful institutions and positionalities [Chang 2018] [Rankin 2018] [Terras and Nyhan 2016]. Matt Ratto and Megan Boler view making as “an activity that provides both the possibility to intervene substantively in systems of authority and power and that offers an important site for reflecting on how such power is constituted by infrastructures, institutions, communities, and practices” [Ratto and Boler 2014, 1].

Makers by Mail challenged notions of power by building a distributed making model with a human-centered approach. Often bound by a specific geography and context, traditional makerspaces can face accessibility issues from a number of vectors, such as cost, location, audience, and material. These factors can make it difficult to live out minimal computing’s ethos of maximum justice, which asks practitioners to:

- Reduce the use of technological, cultural, social, and economic barriers to increase entry, access, participation, and self-representation in computing and
- Build systems/projects premised on social justice and difference, not white supremacy and settler colonialism. [Sayers 2016]

The Makers by Mail project sought to address both issues by 1) providing technology education that is both accessible and affordable for individuals and groups with limited access to other makerspace programs and 2) developing relationships with traditionally marginalized groups. We were moderately successful within our spheres of influence: in 2016, Boyles was involved in local and international digital humanities communities and Petersen was a member of organizations serving public and academic libraries. However, the project’s distributed making model conflicted with institutional notions of who should make, increasing the precarity of both the project and its community. Further, these power dynamics inhibited the project’s access to the resources and support needed for growth and sustainability.

Precarity is a frequent issue for makers and makerspaces, as they are often dependent upon limited labor and funding resources. As Boyles et al. note, “Many digital humanists, as well as their critics, have noted the stratification of labor in the digital humanities and the scarcity of resources available to sustain those various classes of workers and the larger collaborations or centers to which they contribute” [Boyles et al. 2018, 697]. Minimal computing’s relationship to precarity cannot be ignored. In an environment of increasing austerity — both academic and otherwise — minimal methodologies encourage innovation in the face of scarcity. As Alex Gil notes, “Minimal computing does not stand in as a universal call, but rather as a space for new questions and practices, an injunction to constantly repeat the question, ‘what do we need?’” [Gil 2015].

Minimal computing responds to this question by operating, and even excelling, in conditions of precarity. Minimal approaches require minimal resources, reducing barriers to access and inclusion. This philosophy is particularly compelling, as it extends beyond the walls of the university into communities that have traditionally been excluded. The Makers by Mail project was drawn to this methodology, as we believe that our greatest responsibility as scholars is to extend public knowledge and to work for the betterment of society. Minimal methodologies also made it possible for us to succeed in spite of our own precarity, in terms of positionality, resources, and support.

At the same time, we acknowledge that minimal computing cannot address the broader inequities within our institutions and, in fact, may even demonstrate that scholars, researchers, teachers, and practitioners can do more with less. One term for understanding this phenomenon is “resilience,” or “the process of adapting well in the face of adversity, trauma, tragedy, threats or significant sources of stress” [APA 2012]. In our ongoing community-engaged scholarship, we, the principal investigators of Makers by Mail, have seen resilience weaponized against vulnerable peoples and groups. In particular, the term “resilience” was used to downplay government failures in post-Hurricane María Puerto Rico by drawing attention to the incredible recovery work implemented by local grassroots community organizations. As Yarimar

Bonilla and Marisol LeBrón note, “The much-touted resilience of Puerto Ricans thus needs to be itself understood as a form of trauma: years of abandonment by local and federal governments have forced community to take care of themselves” [Bonilla and LeBrón 2019].

While the contexts in which resilience is applied vary greatly, rhetorics of resilience have become increasingly popular tools for downplaying precarity, austerity, and vulnerability. Makers by Mail demonstrates the complex relationship between power, precarity, and minimal computing by demonstrating how minimal methodologies alleviated elements of our precarity while simultaneously exacerbating it in others.

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## Project Strengths, or How We Operationalized Precarity with Minimal Methodologies

Minimal computing made it possible to launch the Makers by Mail project with limited financial and institutional resources. As Alex Gil and Élika Ortega articulate, minimal computing can refer to a variety of activities and approaches, including minimalist hardware, “eliminating clutter [...] ease of use, ease of creation, increased access, and reductions in computing” [Gil and Ortega 2016, 28–29]. In the development of its kits, Makers by Mail followed two distinct approaches to minimal computing.

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The first embodies the values of increased access and ease of use. Makers by Mail’s initial offering was a surveillance camera kit using littleBits and a digital camera. Intuitive, modular, and easily constructible, littleBits are a fantastic resource for introductory making, providing an easy access point to understand circuitry. This kit was designed for users seeking to enhance their digital literacy in a fun and accessible way. Since acquiring littleBits can be cost-prohibitive, Makers by Mail provided an affordable method of access by charging users only for the cost of shipping rather than for the technologies, allowing them to experiment with the littleBits on a provisional basis before making a larger time or financial investment.

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The second approach emphasizes minimalist hardware, working with communities to build basic servers. Using a Raspberry Pi 3 Model B and step-by-step instructions, this kit walked participants through the steps of building a locally hosted web server. As this is often a daunting task for individuals, testing out the process of building a server prepared participants to understand their own hardware, host games, securely store information, and more. While this kit asked users to engage in more advanced computing than the littleBits kits, it was designed using minimal computing technology. In essence, the kits’ Raspberry Pis are computers stripped down to include only the most necessary components; however, this approach can make Raspberry Pis more, rather than less, complicated. For example, while Raspberry Pis have enough hardware onboard to allow for a wide array of computing projects, their stripped-down nature requires users to attach peripherals to fully engage with the system. As Gil and Ortega note, minimal computing does not always equal “minimum effort” [Gil and Ortega 2016, 28]. In this case, our community felt that access to a completely private, locally-hosted server was worth the barriers to access.

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Our team also turned to minimal computing to address infrastructural issues by returning to the question, “What does the project need?” We focused on rapid prototyping with technologies owned or borrowed by the collaborators, providing space to experiment and play. We settled on United States Postal Service (USPS) Priority Mail shipping for distributing kits, solving the question of distribution scale. We relied upon existing connections for user testing, garnering feedback from relevant user groups. The precarity necessitating these solutions — our positionality as a graduate student and a postdoctoral fellow — lent its own affordances, given that our supervisors and the institution had few expectations regarding our research topic, project scope, or publication record.

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## Rapid Prototyping

At the project’s onset, the project collaborators had a series of connections within various Midwest public libraries, a library graduate program, and the digital humanities community. Leaning on these relationships, our team was able to rapidly prototype kits and develop ideas in a variety of communities. Small focus groups and pop-up events provided venues for participants to give feedback on the clarity of directions, ease of assembly, entertainment factor, and more.

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This feedback gave us the opportunity to iteratively revise our kits, resulting in improved instructions and kit contents. For example, after some public librarians expressed uncertainty over where they would have patrons hook up Raspberry Pis, we revised the Server Kit to include a miniature touchscreen monitor.

## Distribution

In the developmental process of Makers by Mail, our project team centered a need for portability and scalability. As we sought to provide accessible and affordable technology education, we wanted our kits to be able to be easily distributable while maintaining transparency and consistency of costs to users. Ultimately, we settled on using USPS Flat Rate shipping boxes for the distribution of our kits. Costing the same for anywhere in the contiguous United States, these boxes were freely available and consistently dimensioned, allowing us to accurately state the cost of shipping any number of kits. Building Makers by Mail with these shipping boxes in mind, we were able to keep participant costs down and choose technologies, packaging, and instructions that could be easily transported, reused, and replicated.

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## Broad Connections

An additional strength of the Makers by Mail project was its broad focus on college-aged and adult audiences. Many conventional makerspaces and maker initiatives have been targeted either towards introducing elementary or middle school students to technology or to the heavily tech fluent. While K-8 initiatives serve as an exhilarating way to engage youth with technology, these introductory resources can appear too simple for adult audiences, failing to build an interest in more in-depth maker technologies. Likewise, tools geared towards the tech-fluent — CNC machines, woodworking equipment, 3D printers, or laser cutters — often exclude and intimidate adults first starting out with critical making. For these reasons, our team focused on developing kits aimed at college students and adult audiences. With public library programming garnering interest from broad age ranges and technological fluencies, we focused on developing adaptable kits that could be informative and accessible for beginners while allowing for ample remixing and play. With this unique introductory adult focus, Makers by Mail presented the possibility of broad connections in public libraries, community organizations, college classes, and other academic programs. Partnered with its ease of distribution and scalability, the kits could readily be mailed to a diverse array of users.

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## Project Challenges, or the Harms of Precarity

While the project has many strengths, minimal computing methods could not address the broader issues of precarity within the institution and community. In particular, our positionalities — as a postdoctoral fellow and a graduate student — limited numerous opportunities for project growth and sustainability, including the project team's ability to build community, acquire funding, and collaborate effectively.

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## Community-building

The Makers by Mail project was designed to foster community-building and collaboration, but we had limited experience developing relationships with organizations outside the academy. Hoping that the project would serve as a springboard for community-building, we launched a publicity campaign, reaching out to local schools and public libraries as well as presenting at conferences including the Iowa Library Association's (ILA) annual conference, the Alliance of Digital Humanities Organizations (ADHO) annual conference, and Implementing New Knowledge Environments (INKE). Doing so generated interest in the project and led to meaningful conversations on best practices for implementing the kits in classrooms and workshops with a handful of collaborators testing the kits at their own institutions.

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One of the most important lessons we learned is that relationship-building should always come before project development and implementation so that community organizations can communicate needs, share priorities, and offer feedback on content and direction. Failing to do so results in a misalignment of priorities in which scholars are placing their needs before that of the community. This, in turn, leads to complications or relationship dynamics that reinforce harmful top-down power structures between the institution and the academy.

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To address these concerns, the Makers by Mail project conducted focus groups to test out a variety of kit designs;

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however, our participants were limited to a handful of graduate students and public library patrons. The feedback these groups provided was valuable but lacked the broader representation needed to develop kits that were dynamic, useful, and accessible to our desired audience: marginalized communities throughout North America and the Caribbean.

Since both principal investigators were on limited term contracts — Petersen was in the last year of his Master's in Library and Information Science and Boyles was in the first year of a two-year postdoctoral fellow position — there was not enough time to build long, sustained collaborations with community organizations. Perhaps the biggest lesson learned during the launch and deployment of Makers by Mail is that community-building takes time. In fact, we are still actively building relationships with many of the partners we first contacted in 2016, especially those who are collaborating with us on the Archivo de Respuestas Emergencias de Puerto Rico — our current community-engaged digital humanities project.

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## Funding

The Makers by Mail project received a microgrant from the Association for Computers and the Humanities (ACH), which allowed our team to purchase the technology needed to develop one of the three available kits. It soon became clear, however, that most other sources of funding — both internal and external — were dependent on the project having a tenure-track faculty member listed as principal investigator. With these funding limitations, the project became more reliant on personally owned technology, loaned materials, and tenuous collaborations.

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These challenges were most explicitly seen in the development and adaptation of kits, particularly when trying out new technologies. Although our team and focus groups expressed interest in an array of other kits, including basic circuits and wearable computing, we were limited in our ability to purchase and test new technologies and frequently barred from educator discounts or negotiated university pricing. For example, after our team expressed an interest in developing a Radio-Frequency Identification (RFID) Arduino kit, one collaborator ultimately acquired the necessary supplies by asking for them as a birthday gift.

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For the long-term success of this project, Makers by Mail would need a more robust funding structure, both to replace materials and to maintain the currency of the kits. Some of the initial technologies used in our kits proved relatively frail, particularly when repeatedly used or distributed. LittleBits proved particularly susceptible to damage, with replacement components running between five and fifty dollars each. Outside of the core technologies, each kit also necessitated consumables — packing tape for shipping, instruction cards, batteries, and more — which added small costs over time. Alongside the need to replace components, some amount of funding would be needed to update the circulating kits. For example, since we acquired the materials for the Server Kit, multiple new generations of Raspberry Pis have been released. Although the project's early third generation Raspberry Pis work well, if one breaks, it will become increasingly difficult to find an exact replacement. Likewise, new generations of kit components may feature different computer architecture or functionality with peripherals, requiring revised documentation and more replacement components. In many instances, updated or replacement components are fine; however, others have difficulties interfacing with older parts or require more capital investment to revise the kits.

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## Collaboration

For a brief period of time, the Makers by Mail project included a third principal investigator — a tenure-track faculty member at the University of Iowa. Initially, this collaboration was successful; the three of us communicated well and complemented one another. Over time, however, the unequal power dynamics among the principal investigators — reinforced by the institution — proved to be highly problematic.

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For example, only tenure-track faculty members were eligible for internal grants. This meant that what little internal funding we acquired was under the sole control of the tenure-track faculty member, who opted to use the funds to purchase littleBits against the advice of the other collaborators. This choice was particularly contentious because, as Kim Martin notes in her review of the project, “[L]ittleBits, while great for sparking curiosity, break quite frequently and require batteries to operate. While the only other consumable in the kits at the moment is duct tape, one can imagine this number growing as the projects expand, and these costs, in addition to replacements for obsolete technology, have

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to be accounted for as the project grows” [Martin 2020]. This choice ultimately hurt the project’s long-term sustainability by ramping up costs that could not be absorbed by the project’s budget.

Additionally, only tenure-track faculty members could be listed as principal investigators for most internal and external awards. This led to issues with credit, as most official documentation, including that disseminated by the institution, gave recognition solely to the tenure-track faculty member. When our faculty collaborator refused to address these inequities, the three of us parted ways. The dissolution of this collaboration was particularly painful, as the tenure-track faculty member claimed rights to all technologies — even those purchased with funding awarded to the three of us. This effectively bound the project to the University of Iowa, making continuation of the project difficult once the two precariously positioned project collaborators had left the institution.

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## Teaching Commons

Alongside the acquisition and distribution of technologies, a crucial element of Makers by Mail has been the development of related teaching materials. To go along with the makers kits, our team intended to include physical copies of instructional materials, a print facilitators guide, and supplemental online resources in a Teaching Commons. These supplemental materials were meant to be a backbone of the Makers by Mail project, allowing groups to experiment with a variety of lessons, target activities to their specific interests, troubleshoot malfunctioning technologies, or even begin developing their own kits. Unfortunately, the Teaching Commons never came to fruition, with only physical copies of instructions provided with the kits. Uncertainty about the project and collaborators’ academic futures paired with regular remixing of kits resulted in the Teaching Commons always being a “next step” in the process that was never developed. Before this project could ever truly prove broadly successful, reconsideration and development of the Teaching Commons would be a must.

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In her review of Makers by Mail, Kimberley Martin points out this necessity, stating, “Makerspaces, no matter where they are located, are made possible, and even profitable, by the community members that frequent them” [Martin 2020]. With this consideration of community in mind, were we to revamp the project, our team would likely reconsider where the Teaching Commons is housed. Although having these resources directly on the site is beneficial, Makers by Mail would likely reach a broader audience if the instructional materials were also housed in a collaborative network like Humanities Commons or HASTAC. Inclusion on these sites would tap into a network of like-minded scholars and help establish connections within the academic community; however, this transition alone would not break down the cultural and technological barriers Makers by Mail seeks to address.

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## Conclusion

This article has examined notions of power and precarity within the Makers by Mail project to interrogate the relationship between minimal computing methodologies and academic contingency. Doing so pushes us to reconsider the question “What do we need?” to center not only technological tangibles but also human(e) requirements for effective and ethical engagement.

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While this piece focuses on Makers by Mail, we hope our experience can bring attention to the ways in which precarity operates and is operationalized by individuals and institutions to reinforce traditional notions of power and limit opportunities for marginalized peoples and groups. We hope that our experiences offer insight into the lives of precarious digital humanists, and that they continue pushing our field to reconsider when and how we support digital scholars and their projects.

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There are many ways to push against precarity in digital humanities: providing better contracts, paying higher wages, offering funding opportunities, developing mentorship networks, giving appropriate credit, supporting career growth, and promoting structural change. Any of the above would have helped shift our work away from precarity and toward praxis — working with and supporting communities.

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While minimal computing methodologies can help us alleviate some of the structural inequalities within higher education, we cannot achieve maximum justice until we address the problem of precarity within our own institutions.

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