GROWING A
FOREST

VALUES-ALIGNED APPROACHES TO TRANSFORMATIVE SCHOLARLY COMMUNICATION

A Report on Year 2 of the
Next Generation Library
Publishing project

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Executive summary

The Next Generation Library Publishing (NGLP) project is working to improve and increase open publishing pathways and services for scholarly authors, editors, and readers. Today's dominant, profit-centered approach to scholarly publishing (estimated to be a $26 billion per year industry) treats information as a commodity, limiting its circulation to increase its value. The end-to-end environments designed and sold by profit-driven publishers create significant barriers to autonomy and choice within this industry, and the price tags associated with both publishing and accessing content, data, and infrastructures in these systems prohibit the fair and equitable production and circulation of knowledge for wide numbers of prospective authors, editors, and readers.

NGLP aims to transform the scholarly publishing landscape by empowering academic institutions to reclaim research communication as a core activity. Library publishers, along with university and scholar-led presses and other nonprofit publishers, provide a crucial counterpoint and potential competitive alternative to commercial publishers. These mission-aligned library publishers need interoperable and flexible tools and values-driven partners to actualize a change in ownership and control of scholarly communication.

NGLP is helping library publishers to build holistic solutions that combine technology development with collaborative network development to sustain an open, scalable, values-aligned publishing system. We are doing this by:

1. integrating open source platforms already widely used in the community by producing a modular architecture that allows service providers to mix and match these existing components to deliver hosted solutions geared towards different library publishing community segments;
2. building a unified web delivery front end so that library publishers can publish institutional repository and journal content from multiple content production systems in one place;
3. building an analytics tool that provides a comprehensive view of usage and workflow metrics from multiple platforms; and
4. seeding a range of hosted solutions and support options that are reliable and sustainable and meet the needs of different library publishers;
5. producing, vetting, and refining a framework to help library publishing stakeholders to assess and improve their alignment with academic values and principles.

In the second year of the NGLP project (September 2020-August 2021), we delivered research findings based on extensive community engagement, produced specifications for technologies to unite and complement existing open source tools, progressed towards minimum viable products (MVPs), and initiated coordination of three pilot implementations of publishing solutions that represent different service use cases. We also produced, vetted, and refined the FOREST Framework (forthcoming 2022), a values and principles alignment mechanism that undergirds and supports the NGLP approach.

Our second year work and outputs include:

- [Scholarly Communication Technology Catalogue](#), SComCat (February 2021), a tool to assist stakeholders in making decisions about which technologies they will adopt by providing an overview of the functionality, organizational models, dependencies, use of standards, and levels of adoption of each.
- [Living Our Values and Principles (October 2020)](#), a white paper that examines varied "values and principles" efforts in scholarly communication, and that proposes a methodology for incentivizing stronger adherence to agreed-upon academic values and principles.
- "[Library Publishing Infrastructure: Assembling New Solutions](#)" [(March 2021)](#), a report that shares what we learned from our extensive research with more than 150 library publishing stakeholders and how it guides our work.
- Specifications for a Web Delivery Platform ([WDP MVP](#)) and an Administrative Dashboard ([AD MVP](#)) and their potential connections to existing open source platforms to facilitate end-to-end repository and publishing
- Development on the WDP and AD components (with MVP completion in early 2022)
- Definition of three distinct publishing use cases with three pilot partners (pilots to launch April 2022)
- Attracted 40 library publishers to serve as user-group volunteers throughout the remainder of the project period

NGLP's approach is grounded in values and principles. We seek to empower values-aligned organizations, center values-based practices in scholarly communication, and hold communities accountable to these values.

In the following pages, we provide a detailed account of NGLP's second-year accomplishments, outputs, and increasing impact and describe in depth the values-based framework through which we approach our work.

Introduction

The Arcadia-funded Next Generation Library Publishing (NGLP) project is working to improve and increase open publishing pathways and services for scholarly authors, editors, and readers. Today's dominant, profit-centered approach to scholarly publishing treats information as a commodity, limiting its circulation to increase its value. The end-to-end environments designed and sold by profit-driven publishers create significant barriers to autonomy and choice within this industry, and the price tags associated with both publishing and accessing content, data, and infrastructures in these systems prohibit the fair and equitable production and circulation of knowledge for wide numbers of prospective authors, editors, and readers.

Our project demonstrates how a modular, open-source suite of platforms and tools can be offered as turnkey solutions by trusted service providers to support campus-based, open access publishing.

In close partnership with academic-mission-aligned service providers and open source tool-builders, NGLP resists these end-to-end, locked, "black-box" systems by cultivating robust, alternative publishing platforms and values-driven community frameworks for governance, assessment, and accountability. Our project demonstrates how a modular, open-source suite of platforms and tools can be offered as turnkey solutions by trusted service providers to support campus-based, open access publishing.

We are laying the foundation for widespread adoption and integration of open source tools and services within the library publishing community. As part of this work, we are seeding the development of a network of publishers, tool developers, and service providers with a strong, interconnected business framework designed to support open, interoperable solutions that intentionally align with academic values and principles.

We structured the NGLP project around the question: What does it take to transform a sector? Using a sociology of business framework, we have planted seeds of change in three interconnected areas that we believe hold great potential to transform scholarly publishing: *alignment with academic values and principles*, *technical interoperability*, and *collaborative business networks*. This holistic approach increases the likelihood that our work will effect change in the structures that scholars, libraries, and publishers use to share and publish their research findings.

Who are library publishers and what is their role in systemic change?
Embedded in the academy and imbued with the values of open scholarship, library publishers provide a critical lever for systemic change. Library publishing models offer robust alternatives to traditional publishing, making reputable, high-quality open access (OA) scholarship broadly available, giving authors greater control over how their work is published and disseminated, and providing a home for a diverse array of content that historically has not been well served by commercial scholarly publishers.

Library publishing programs have demonstrated their value and viability as an alternative and complement to commercial scholarly publishing.[1] As they expand and mature, they require new technological and operational infrastructure to effectively steward and promote a growing range and volume of scholarly and creative outputs. With strengthened infrastructure, library publishers of all shapes and sizes can offer high-quality publishing services that align with the values of openness, equity, and sustainability and that compete with more profit-centered publishers.

The NGLP project aims to help materialize this vision through a combination of research, community-building, technology development, and service modeling. NGLP's second year of work builds upon the Library Publishing Coalition's (LPC) community of practice, the operational insights provided by the Library Publishing Workflows project,[2] and the intensive information gathering and outreach undertaken by our team in the first project year.[3] The project centers the expertise of library publishers in order to empower them, bringing the collective experience and wisdom of this community into collaboration with developers and service providers who can build and sustain leading edge publishing solutions. Regular and ongoing community engagement has been carefully cultivated through working groups, consultations, workshops, and forums.

Year 1 recap: Developing informed solutions to serve community needs
Community engagement efforts throughout the project have identified remarkably consistent needs and desires among library publishers.[4] In our first year of work, library

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[1] See e.g., the 2022 edition of the *Library Publishing Directory* which features nearly 150 library-based publishing initiatives around the world. These range from small liberal arts colleges publishing a handful of journals to large universities and consortial initiatives building expansive portfolios of journals, books, learning objects, gray literature, experimental media, and other content.
[2] https://educopia.org/library-publishing-workflows/
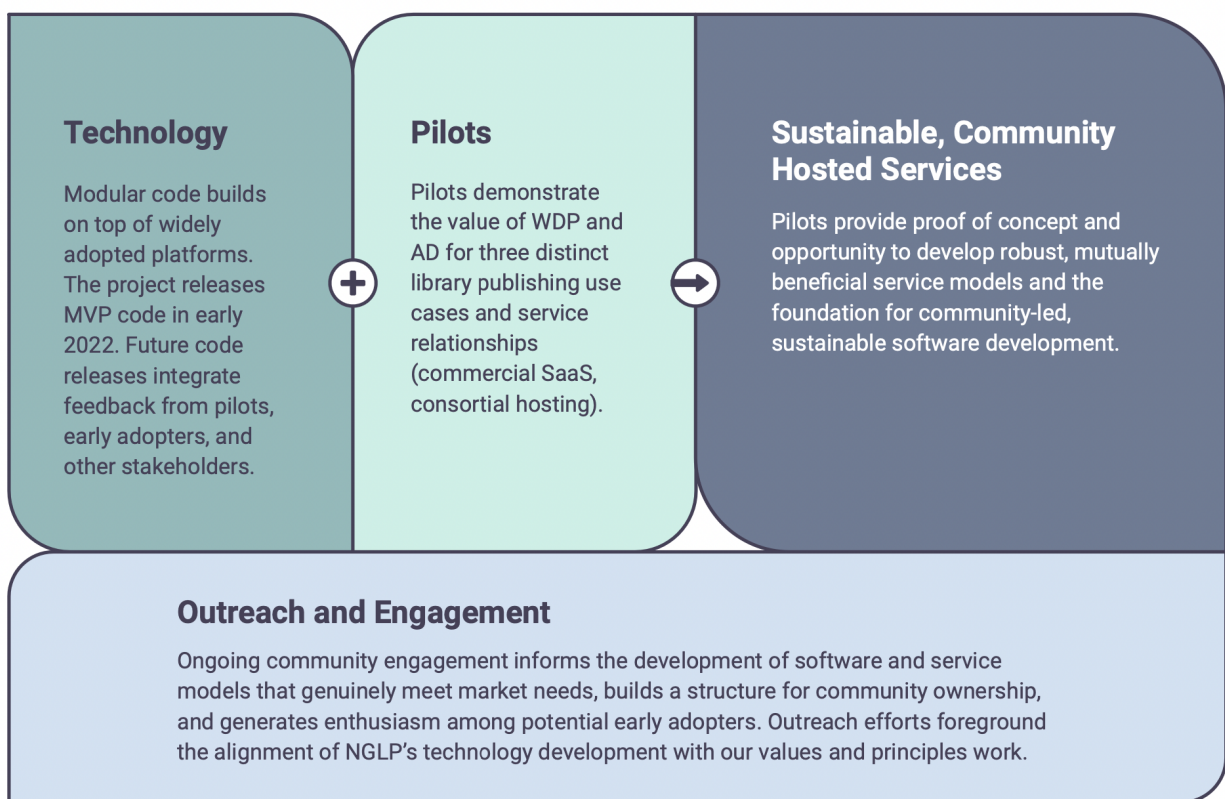[3] https://educopia.org/nglp-lib-pub-infrastructure/
[4] See Ratan, et al. (2021) "Library Publishing Infrastructure: Assembling New Solutions" for a summary of this community engagement work.

publishers confirmed through an array of interviews, focus groups, surveys, requests for input, and workshops that the following criteria should guide our technical development and operational work:

1. Build on top of what already works. Establish a modular infrastructure model that enables the community to continue working with familiar and functional open source publishing tolls, but enhance their functionality and associated tools.
2. Provide a seamless, integrated user experience across these platforms, allowing for robust management and use of a diverse portfolio of published content. In particular, support unified web delivery that unites content from multiple sources into a modern, flexible discovery and display platform. This enables them to take advantage of submission and curation tools optimized for different types of content, while also building multi-format collections that represent the full breadth of scholarly and creative output.
3. Develop an analytics dashboard that provides a bird's-eye view of both workflow and engagement metrics. Workflow metrics facilitate capacity planning, resource allocation, and strategic planning efforts. Engagement metrics help library publishers, editors, and authors demonstrate the value of their work.
4. Ensure community governance and a robust marketplace of values-aligned service providers that can offer a range of hosted, turnkey solutions that mix and match existing and new components into a variety of iterations optimized for different use cases.

In the project's second year, we have continued to focus our attention on listening to and responding to the library publishing community, building tools and frameworks to support their needs using iterative cycles and constant feedback loops. As depicted in Figure 1 below, each interconnected aspect of our work (outreach and engagement, technology development, pilot implementation, and community-hosted service delivery) centers and builds upon the shared values and principles of this community.

Technology

Modular code builds on top of widely adopted platforms. The project releases MVP code in early 2022. Future code releases integrate feedback from pilots, early adopters, and other stakeholders.

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Pilots

Pilots demonstrate the value of WDP and AD for three distinct library publishing use cases and service relationships (commercial SaaS, consortial hosting).

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Sustainable, Community Hosted Services

Pilots provide proof of concept and opportunity to develop robust, mutually beneficial service models and the foundation for community-led, sustainable software development.

Outreach and Engagement

Ongoing community engagement informs the development of software and service models that genuinely meet market needs, builds a structure for community ownership, and generates enthusiasm among potential early adopters. Outreach efforts foreground the alignment of NGLP's technology development with our values and principles work.

Figure 1. Outreach and engagement form the foundation for NGLP's software and service development.

By approaching our problem space collectively and along multiple vectors, NGLP seeks to cultivate holistic publishing solutions that align well with the academic values that distinguish library publishing from other approaches. We are providing not only the technologies that library publishers need, but also the scaffolding that makes these technologies accessible, sustainable, and community-led over the long term. In promoting this approach, NGLP is also asserting values-alignment as foundational to scholarly communications work. We believe that the collective action detailed in this document can serve as a model for other projects that seek to transform sectors and move towards values-aligned products and services.

Connecting a values-aligned community

Can we put the library publishing community at the core of transformative change in scholarly publishing?

Articulating values and principles
Scholars and other scholarly communications stakeholders have critiqued the scholarly publishing industry and called for change for decades, yielding more than 100 manifestos and declarations, open letters and descriptive lists to date. The NGLP project team's 2020 [analysis](#) of these initiatives shows that the values and principles espoused across them are remarkably consistent; it also indicates that while some of these initiatives have called for alignment with these values and principles, they have not yet provided mechanisms to enable those involved in publishing to concretely evaluate and improve their own practices in this regard or to enable funders and investors to use values alignment to inform their partnership decisions.[5]

Based on our findings, we have worked with a broad range of academic stakeholders to more concretely define their values and principles in terms of measurable actions, so these statements can be readily assessed and audited. In 2020, we proposed and vetted an initial methodology for auditing publishing service providers to ensure adherence to agreed-upon academic values and principles, with the dual goals of helping to guide values-informed decision making by academic stakeholders and encouraging values alignment efforts by infrastructure providers.[6] We also explored ways to structure this assessment framework both to avoid barriers to entry and to discourage the kinds of "gaming the system" activities that so often accompany audits and ranking mechanisms.

In October-December 2020, our team contracted with Invest in Open Infrastructure (IOI) to enable Kaitlin Thaney and Samuel Moore to provide an external review of our draft *[Values and Principles Framework and Assessment Checklist](#)*. This review included two main elements: assessing NGLP's framework/checklist and then applying them to a set of project partners,

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[5] See Katherine Skinner and Sarah Wipperman, "Living Our Values and Principles" (October 2020). Available: https://educopia.org/living-our-values-and-principles/

[6] See the Katherine Skinner and Sarah Lippincott, "Values and Principles Framework and Assessment Checklist," which were issued for public comment in July-August, 2020 on *CommonPlace* (hosted by the Knowledge Futures Group). Available: https://doi.org/10.21428/6ffd8432.5175bab1

specifically LYRASIS, DSpace, Janeway, Public Knowledge Project, Longleaf, and California Digital Library. This process provided our team with an external test of the resources; it also demonstrated that our core pilot and technical partners explicitly met or surpassed key criteria, marking their strong alignment with the scholarly values and principles we had identified as core to this work.

Based on the public comment period feedback and the IOI pilot findings, we worked with the library publishing community to produce, vet, and refine what we are calling the FOREST Framework, to connect commonly agreed upon values and principles with evidence-based, measurable criteria. This Framework, which will be formally issued later in 2022, makes visible the ongoing values-aligned policies and practices of all actors (publishers, tool developers, and service providers) who engage with the NGLP environment, incentivizing them to intentionally improve their alignment with these values over time.

The FOREST Framework distills six core values that have been espoused across more than 200 values and principles efforts and defines them in action-based and measurement-oriented terms:

1. **F**inancial and organizational resilience
2. **O**penness
3. **R**esponsible governance
4. **E**quity, accessibility, anti-oppression
5. **S**haring of knowledge
6. **T**ransparency

This Framework includes instruments for self assessment and reflection that can be used by many stakeholders in scholarly communication, including library publishers and the tool developers and service providers that support their work. These instruments have been designed to recognize growth and progress (rather than just results), identify strengths (rather than only deficits), and center aspirations (rather than descriptions of the current state).

The project's own work reflects and is grounded in these values and principles; it serves as the backbone for our approach and guides our outputs and outcomes. The FOREST Framework is already helping to inform other values-aligned institutions, even prior to its release: our year two outcomes include five consortia using the draft Framework to inform

their strategic plans, and more than 20 library publishers, tool developers, and service providers actively aligning their work with the draft Framework. We expect these outcomes to grow significantly as we launch the formal release in March 2022.

Keeping community actively engaged and involved

In keeping with the project's values-based approach, our team has consciously striven to engage and involve the library publishing community, including open source tool developers and service providers, in every component of our project's work. Building on the deep research we conducted with hundreds of individual actors in our first project year, the NGLP team opened its second year of work by collating the information gathered through our 2019-2020 community outreach into user stories, use cases, and requirements to hand off to our technology partners. We also assembled and released the "Library Publishing Infrastructure: Assembling New Solutions" report to openly and transparently share our findings in hopes that other development efforts may benefit from this research.

As development began in late 2020 and progressed over the course of 2021, the NGLP team sought regular input from the library publishing community, enabling the team to continually refine development specifications in accordance with evolving stakeholder needs. These engagement activities included conference presentations; regular meetings with our Advisory Board; and, even more directly, the establishment of targeted user groups and working groups, a quarterly newsletter, and our first Community Forum.

User Groups

An NGLP user group open to any interested member of the library publishing community regularly convened starting in June of 2021, both in groups and also in one-on-one meetings.[7] Fully 40 users have used the user group to engage in iterative design activities and information sharing around both the technology and service development. The feedback from these sessions has had an immediate impact on our developers, offering invaluable direction and assisting in prioritizing specifications for the first release of both components.[8]

As NGLP seeks to refine its technology and service development in 2022, our user group will subdivide into cohorts organized around scales and contexts. By identifying

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[7] A list of participants will be made available publicly (with permission from participants) at the end of the project in 2022.
[8] Reports summarizing user group sessions held over the course of 2021 can be accessed at https://bit.ly/NGLP-publicdocs.

commonalities among library publishers, these cohorts can better identify where tailored functionality or alternate structures of support from service providers can best serve library publishers in certain contexts.

Newsletters and Mailing List

NGLP is also committed to keeping the broader library publishing community updated and engaged throughout the development process. Our mailing list of over 180 community members receives newsletters and periodic updates on the progress of the project as a whole.[9]

Community Forum

We announced our first Community Forum in October 2021, and we received an overwhelmingly positive response from the community. With more than 200 registrants, the Forum proved a perfect venue for updating participants on the progress made and engaging a broader segment of the community in generating feedback and interest in further stages of the project.[10]

The high level of ongoing community engagement in the project signals the value of the NGLP offering and validates our approach, not only for library publishers and other potential users, but also for potential service providers, who continue to deepen their interest in and connection with our project.

Though the most difficult part of rolling out any new solution is attracting early adopters, NGLP already has a large (and steadily growing!) pool of engaged library publishers following our work and looking for ways to use it. All of these different approaches to connect with library publishers provide a ready market of early adopters for the pilots and initial service offerings that follow.

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[9] Previous newsletters are accessible at https://mailchi.mp/56f9ffc4824b/nglpforum and https://mailchi.mp/9eb90906770d/nglpforum2022.

[10] View the recording of our first Community Forum at https://www.youtube.com/watch?v=-r_LR7Vib1M or read an overview of the Forum at https://educopia.org/building-community-transparent-open-source-development/

Coordinating a values-aligned build

Can we develop interoperable tools that build on what already works while keeping the door open for innovation?

Creating a solution space, not a single stack
[The library publishing community asked our team](#) to deliver a strong, sustainable, modular infrastructure that would leverage (not replace) existing tools, advance their feature sets, and simplify their workflows. In our second year of work, NGLP has developed a suite of resources that combine the values alignment of open source software with the convenience of turnkey publishing and repository solutions. We have structured the NGLP framework in transformative ways, developing integrated solutions for library publishing that can scale and evolve without a centralized (and profit-centric) business model or lock-in mechanics.

Working with two stellar development groups, [Cottage Labs](#) and [Cast Iron Coding](#), our team has built a Web Delivery Platform (WDP) for robust, unified content discovery and display and an Analytics Dashboard (AD) for powerful usage and workflow metrics. The Web Delivery Platform (WDP) and Analytics Dashboard (AD) prioritize flexible content delivery, impactful integrations with other technologies, schema-based architecture, and permissive software licensing.

These components integrate with each other, and they enable new, long-desired integrations between an initial set of widely adopted platforms (beginning with DSpace, Janeway, and OJS; see Figure 2 below for an example workflow) maintained by values-aligned organizations. The inherent flexibility of this model means that we are creating a solution space rather than a single stack. This solution space can grow and scale in multiple directions and with different tools. The approach empowers open-source builders and service providers to imagine and launch new services over time.

NGLP has developed a suite of resources that combine the values alignment of open source software with the convenience of turnkey publishing and repository solutions.

We are building open software in the open: actively pursuing community oversight and input, making code and documentation immediately available, and seeking external validation of our

approach and outputs at each step.[11] We elaborate below to provide full details about each of these tools and the new capabilities they enable.
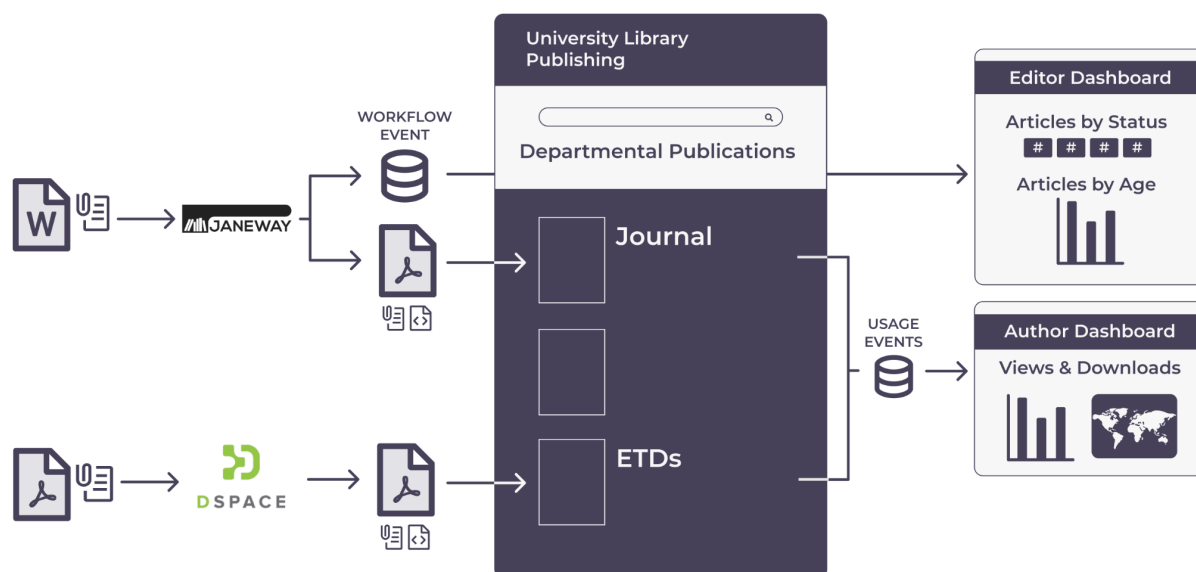

Figure 2. Content flow from upstream submission systems to WDP and AD.

Flexible content delivery - The WDP

The WDP ingests content from multiple upstream submission and curation systems such as DSpace, Janeway, and OJS, into a unified discovery and display platform. Administrators can mix and match content into different collections, customize templates for different community pages, and support a single access point to a rich portfolio of content. The WDP meets a range of use cases, from a single library publisher that wants to unify content from a journal publishing platform and an institutional repository, to a consortial publisher that wants to aggregate content from multiple publishers.

Technology should not dictate the shape of a library publisher's portfolio. The content-agnostic WDP empowers library publishers to showcase their full portfolio of outputs. Library publishers can maintain submission and review workflows optimized for different content types (e.g., utilizing Janeway for journals and DSpace for electronic theses and dissertations) and assemble the results into a single discovery and display platform. Attractive, content-aware, customizable templates showcase a range of content types and allow administrators to apply collection-level branding. Non-technical users will be able to manage communities, collections, items, and various supporting records, whether that

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[11] For additional information about the architecture of the WDP and AD, see our technical documentation at https://bit.ly/NGLP-publicdocs. Code for both components is published to our GitHub repositories.

content is ingested from an external content provider or authored in the WDP. Customizable JSON schemas govern content and metadata display and behavior; built-in templates tailored to different content types ensure that a white paper or student thesis looks as polished as a digital-first journal article. Using schemas as the underlying structure gives the WDP outstanding control and flexibility. Schemas ensure that data and metadata remain well-structured and consistent across an instance of the WDP, but also modifiable based on local needs and descriptive practices.
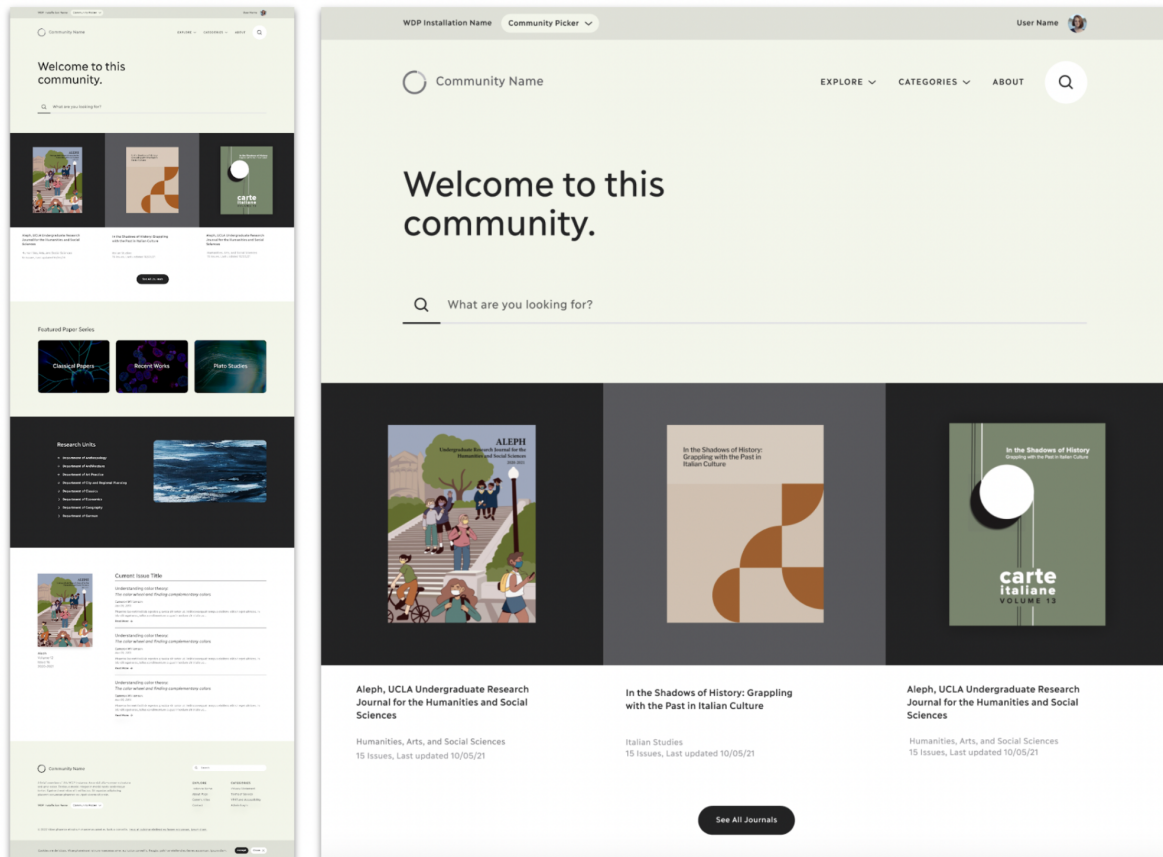
Figure 3. Mobile and standard view of a community landing page in the WDP.

Comprehensive metrics–The AD

The AD ingests and normalizes workflow and readership data from disparate sources (i.e., multiple submission and curation systems) into a single platform, giving library publishers unmatched oversight of their full portfolio. The dashboard ships with a set of compelling built-in reports and dynamic visualizations that allow users to examine collection and content metrics from a bird's-eye view down to the level of an individual object.

Where the WDP unites content from varied sources, the AD ingests and normalizes workflow and readership data from disparate sources into a single platform, giving library publishers unmatched oversight of their portfolio (see Figure 4 below). The dashboard ships with a set of compelling built-in reports and dynamic visualizations that allow users to drill down from portfolio-level data all the way to article-level metrics. A built-in archival content store allows administrators to view unprocessed data to ensure its integrity and to build custom reports in an open source business intelligence platform such as Kibana. Reports can also be embedded directly into our WDP, giving users convenient access to metrics at the point of need.

Figure 4. The AD's impact dashboard, showcasing engagement data for content in the WDP.

The AD is designed to provide both workflow and usage/engagement metrics for content published through NGLP components. Workflow metrics document significant markers in the publication lifecycle, such as average time from submission to publication, acceptance and rejection rate for a journal, and number of submissions assigned to each editor. These metrics facilitate capacity planning, resource allocation, and strategic planning efforts. Engagement metrics comprise views and downloads, geographic reach, referring sites, and other measures of the reach and impact of a publication. These metrics help library publishers, editors, and authors demonstrate the value of their work.

Impactful integrations

The library publishing community relies on a number of widely adopted and trusted open-source software, such as DSpace, Janeway, and OJS. They urged NGLP to build upon these tools to develop end-to-end solutions. Rather than a monolithic solution, library publishers want a modular stack that can be customized to best fit their local needs and that can expand to include additional tools in the future.

The WDP and AD are designed to integrate with a subset of our community's preferred tools to start, and to accommodate additional integrations over time. Both components rely on standards-based mechanisms for content harvest (OAI-PMH and APIs), ensuring their compatibility with a range of upstream systems. By developing components that enhance the interoperability of platforms, NGLP is building for a future where open source components offer a scalable, adaptable alternative to a market that relies on locking library publishers into single-platform solutions.

Modular, standards-driven architecture

The WDP and AD were designed to fill gaps in an overarching architectural plan that places existing open source platforms and tools at the center. By adding these two modular pieces, the architectural landscape can now meet the needs of the community more effectively. And this architecture allows non-profit and mission-aligned service providers to assemble unique solutions to meet different community needs.

The WDP is powered by its API, which ingests content from diverse content providers, transforms it into a consistent format, and stores it. The API exposes the ingested content to frontend and administrative browser applications as a GraphQL endpoint. The API provides a complete and understandable description of all the data it exposes because it is fundamentally self-documenting and strongly typed.[12] On the front end, configurable schemas defined in JSON allow the WDP to move from generic entities (collections, items) to recognizable types of content (journals, articles, books). Strongly typed, structured data also ensures its portability in the event an adopter chooses to migrate to another platform. While the for-profit model of scholarly publishing extracts profits by increasingly consolidating functionality into a single monolithic system and raising costs once library publishers are reliant on the system, NGLP offers an alternative. The WDP's schema-driven approach puts structured data at the heart of the application.

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[12] Read additional technical documentation for the WDP at https://bit.ly/NGLP-publicdocs.

The AD uses platform-specific plug-ins to ingest and normalize data. These plug-ins harvest workflow and engagement events from upstream systems and map them to data points defined in the AD. The AD's built-in archival store provides access to raw data before any normalization or processing occurs, ensuring that metrics are traceable and transparent. A "reporting context" layer gives the AD the information required to transform the harvested data into visualizations and reports. For example, in order to generate a report on "all sponsored journals" the AD must have a concept of what a "sponsored journal" is, and how to separate those from non-sponsored journals in the analytics index. The AD's modular architecture makes it extensible over time. We can build additional plug-ins to support other upstream platforms, connect the archival data store directly to business intelligence systems like Kibana, and develop new built-in reports and visualizations for different audiences and use cases.

Open and transparent development
The NGLP team and our development partners believe that building in the open is key to developing trustworthy, community-driven software. Throughout the year, we have immediately published code to our GitHub repository, complemented by robust technical documentation made available through our public documentation collection.[13]

NGLP also engaged an external evaluator, Open Tech Solutions (OTS), to conduct a platform design and architecture review to ensure our MVP specifications met all functional requirements and that our technical team's selected languages, technologies, and components were put through a rigorous peer review before development began. The report enthusiastically confirmed our approach, noting "We found nothing to give us pause; indeed, if OTS's own tech team were designing a system to meet these same requirements, it would probably look quite similar to the system NGLP, Cottage Labs, and Cast Iron Coding have designed."[14]

> *"...if OTS's own tech team were designing a system to meet these same requirements, it would probably look quite similar to the system NGLP, Cottage Labs, and Cast Iron Coding have designed."*

NGLP's commitment to perpetuating free and open reuse of our software is further reflected in our code licensing

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[13] See https://bit.ly/NGLP-publicdocs and our GitHub repositories.
[14] The OTS report is available through our public documentation folder at https://bit.ly/NGLP-publicdocs.

choices. Both NGLP components are licensed under the MIT License, which imposes few restrictions on reuse. Permissive licensing allows the community to adapt and extend the code to meet new use cases and facilitates the growth of a robust network of service providers. Cultivating this new community of adopters, developers, maintainers, and service providers represents the third aspect of our holistic approach to transforming the scholarly publishing sector.

Cultivating a network of values-aligned service providers and tool developers

Can we provide scalable solutions tailored to the needs of library publishers?

OSS implementation and sustainability challenges

The NGLP team believes open source software (OSS) represents the best alignment between library publishers' technology needs and their core values. However, OSS is resource-intensive to build, maintain, and host. Many institutions, particularly small libraries and publishers, lack the human or financial resources to implement OSS locally. A number of OSS communities have launched hosting services for the platforms and software they maintain. What has been missing is a way to knit these components together to empower library publishers to maintain a modern, flexible, publishing portfolio.

Facilitating adoption and long-term sustainability of a complex, modular, open source software stack requires building a collaborative support network that will steward these tools into the future and make them available to libraries of all sizes. Technology is animated by people and communities, but NGLP is positioned as a project, not as a long-term host or coordinator. Instead, we are putting our deliverables into the capable hands of a decentralized network of stakeholders who will collaboratively direct further development. To set this network up for success, we're building a governance framework that helps to define expectations for service providers, tool developers, publishers, and other stakeholders that want to participate in this nascent marketplace.

Documenting use cases

Service layers are a vital dimension of the NGLP project. These will ensure the NGLP components will be accessible for library publishers at a variety of scales, supporting a range of use cases. As noted above, many library publishers seek hosted solutions that enable them to focus on operational workflows, rather than technical development tasks. Others have technical staffing and prefer to host their own infrastructure.

Four anticipated use cases for mission-driven publishers with a wide range of profiles are described below. These are not meant to represent the full spectrum of use cases, but rather exemplify the range of scenarios we are building toward.

- *Consortial publishing.* A library consortium wants to offer a single access point for content originating from multiple institutions. Its members seek to create economies of scale by hosting a single publishing stack that can meet a range of local needs. The consortial offering must be compatible with local workflows, allow community-level branding, and support granular permissions and role definition.
- *Small library publishers.* Many library publishers are responsible for both an institutional repository and a small journals initiative. These programs want to facilitate discovery and engagement of their full portfolios in a single display layer and streamline repository management workflows. They need flexible, hosted solutions that allow library workers to focus on publishing, not software updates. Many value open source, non-proprietary solutions, and a la carte services.
- *Flipped open access journals.* A research community is ready to flip a journal to open access. They plan to move out of a proprietary system and begin using open source tools for submission and review. They want to ensure that past and future issues of the journal are made available side-by-side for discovery and display.
- *Society publisher.* A society publisher has a portfolio of journals that they would like to unify through a single interface for discovery and display. These journals may have different submission systems and workflows, individual branding, and their own dedicated websites. They require the flexibility to unify journals with different profiles and needs, balancing customization with economies of scale.

These different use cases illustrate the need for a range of service models. A large consortial publisher may have the resources to host the platform in-house, giving them greater control over the infrastructure and the ability to create and deploy their own customizations on behalf of their members. A small library or society publisher might prefer a turnkey solution that provides soup-to-nuts services from technology hosting to customer support. Others might opt for something in between, such as simple infrastructure hosting and maintenance without added-value services.

From use cases to pilot implementations
During the second year of our project work, the team has dedicated a large part of its time and energy to defining and planning three pilots that will launch in 2022. The pilots represent three use cases: a consortial, multi-campus, cross-content solution with unified display and analytics; a turnkey service for journals and IR hosted by a trusted nonprofit partner; and a turnkey journals solution also hosted by a trusted nonprofit partner.

This marks the first round of pilots that NGLP will be launching and supporting. Planned future pilots will include different assemblies of existing OS platforms with one or both of the NGLP WDP and AD components hosted by a range of service providers, including those that are university-based, geography-based, or content-based. These future pilots will also expand to include services and support for other content types, like books and preprints.

The pilots test and showcase the many use cases that the NGLP and partner solutions can support. The first three pilots described below are launching in early April 2022 and the NGLP and partner teams will monitor how each one meets the acceptance criteria agreed upon by the community partners. NGLP will produce a report on pilot outcomes with metrics and next steps in June 2022 and hold a Community Forum to share and discuss the results.

- **Combined Journal and IR hosted solution:** This pilot will be led by Janeway, acting as both service provider and builder of the Janeway manuscript submission system. Janeway will host a solution that combines journal and IR publishing in an end-to-end service. The technologies included will be the NGLP components for web delivery and analytics, with DSpace and the WDP supporting IR functions and Janeway supporting journal submission and peer review. Five established library publishers of varied sizes and structures will participate in this pilot.
- **Consortial library publishing:** This pilot, run by California Digital Library (CDL), will demonstrate how the NGLP components meet the needs of large-scale, consortial library publishing environments. This pilot will integrate Janeway, DSpace, the WDP, and the AD in a CDL-hosted solution. CDL is eager to move away from bespoke, outdated technology solutions and engage more fully with open source platform communities, both as a consumer of and contributor to these efforts. This pilot provides a framework for testing these new solutions at scale and moving toward a more robust and feature-rich set of services for the eScholarship publishing program and institutional repository services.
- **New journals publishing program:** This pilot, run by Longleaf Services, a not-for-profit affiliate of UNC Press, will demonstrate the ease of establishing an institution-based journal services business for existing and new journals that rivals commercial services in its abilities to offer cross-journal collection-building, branding, and analytics. The technologies will be Janeway for journal submission and peer review and the NGLP components for web delivery and analytics.

NGLP's modular architecture, open licensing, and nascent community of practice make all of these models viable. Our business modeling and assessment work, discussed in the next section, puts them on a path towards sustainability.

Future pilots will include additional partners such as the Public Knowledge Project (PKP), builders of Open Journals System (OJS), UK and European-based service providers, and other consortial or campus-based service providers.

Designing strong business frameworks to support open source integrations
Values-aligned tools supporting scholarly communication have most often been built as free, publicly available, open-source code that is notoriously challenging to maintain and sustain. Successful open-source tools and the services built upon them often are managed by passionate-but-limited support teams with lean budgets based largely on membership donations (money, in-kind support), service installations (one-off, or hosted solutions), and occasional grant funds for R&D efforts. This environment has promoted an "every tool/provider for itself" kind of mentality, pitting these efforts against each other instead of encouraging and rewarding work towards interoperability.

Our project envisions a different business framework, one that recognizes and cultivates productive interdependence across the various actors involved in scholarly communication–tool developers, hosts and service providers, library publishers, authors, editors, and users. The long-term success of our modular, interoperable approach depends on cooperation between these stakeholders. These groups must actively foster and support new forms of interaction on both technical and operational levels in the interdependent environment that we envision.

We seek to recalibrate the business models that tool developers and service providers are using (largely membership and donation models) by making more transparent the costs of development, upkeep, and interoperability and how those costs can be shared more effectively across a library publishing investment community. In close consultation with other groups who are exploring this issue (e.g., COPIM, IOI, SCOSS, SPARC), we are working to document the real costs for this set of interconnected technologies and to reimagine how the library publishing community, through both institutional and consortial lenses and arrangements, can invest appropriately in its own future.
Incentivizing this type of sector-wide change requires that we define and show how each stakeholder's stability and resilience will benefit from the NGLP approach and components. To do so, we are working directly with these stakeholders to negotiate a new business

framework that is modeled on successful open source integration approaches taken in adjacent fields.

Business framework working group
Throughout 2021, we have convened and facilitated a group of these stakeholders that includes representatives of some of the most successful tool developers, service hosts, and publishers in our sector. This group is studying and documenting a new type of business and governance model that recognizes and structures the relationships among tools, service providers, and users for their mutual benefit.

These stakeholders are building the trust and connections necessary for a collaborative community of practice. They are also defining workflows between and across tools and actors in order to understand where and when expectations could be set for financial contributions or specific in-kind support. This raises opportunities for new models for revenue flows between different stakeholders, including transparency around how those flows are enacted. As this group continues its work in 2022, it will begin to build directly on the FOREST Framework to set aims and standards for values and principles alignment; it will also work on the development of a trusted service provider registry.

Our aim is to build a community of practice that is defined not by a single tool or platform, but a set of shared goals. Our governance work, like our software, invites the community to consider where each participant excels. We start not by dissolving boundaries between the different stakeholders in this coalition, but by building bridges across them. We want to identify where each partner (and its technology components) can best contribute, and also where it can best receive reciprocal support, so that we can leverage assets in order to address existing gaps. We thereby reinforce the identity and importance of each component while also building a safe form of interdependence between and among them.

The willingness of NGLP's current and interested partners to work within a circle of trusted actors in this space, while acknowledging friendly and healthy competition, is one of the project's most exciting developments. There is a growing understanding that "competing" open-source platform projects such as OJS and Janeway have more to gain by working together than they have to lose, and it is only through these kinds of collaborative and sustainable efforts that open tools and services can compete with large proprietary end-to-end solutions.

Conclusion

As we seek to make equitable, sustainable, and open scholarly publishing the norm, the FOREST Framework and NGLP components open the way for a new, diverse, and healthy ecosystem that includes strong and resilient open source technologies and mission-aligned service offerings.

We sit at an inflection point, watching the library publishing community engage more and more deeply in this work. We are thrilled at what the project has accomplished in its first two years of work, and we are excited for the pilot implementations, values and principles framework, and business framework maturation that we will undertake in 2022.

We are simultaneously mindful of how much more scaffolding we need to build in 2023 and beyond to effect lasting change within library publishing and the broader scholarly communication environment. The library publishing community is ready to use better frameworks to support scholars, and scholars are hungry for the publishing outlet and alignment library publishers can offer.

We are working to bring first-class tools and first-class scholarly content together to position academic libraries to play a central role in the publication and dissemination of scholarly research. This work is already diversifying the options available to library publishers and other campus-based entities by bringing trustworthy open-source integrations into a space that has been dominated by proprietary end-to-end solutions. We are helping to reinvigorate a sense of trust among library publishing programs in the platforms they use and establish new levels of collaboration and interdependence among open source infrastructure and values-aligned service providers to promote viable, sustainable alternatives to profit-driven, proprietary, end-to-end service options.

Future plans (2023 and beyond)
As NGLP looks towards its next phase of work in 2023 and beyond, we aim to launch additional pilots, invest in new technical features and integrations, and enact the business framework.

Our future technical work will involve moving from our minimum viable product (MVP) to version 1.0 of the WDP and AD. Our priorities for technology development include:

1. building out additional product features based on priorities identified by our pilot partners and user group members;
2. adding support for new content types, such as books and datasets; and
3. integrating with additional software, again prioritizing platforms identified by our stakeholders, such as OJS and Hyku.

We also aim to assist each of our pilot partners as they transition to market-ready service offerings. Priorities for this work include:

1. supporting migration tools and workflows;
2. building and supporting a community of practice; and
3. improving documentation and a shared knowledge base.

Above all, we will continue to advocate for systematic culture changes in scholarly communications, facilitating a shift to values-aligned governance and business models, promoting investment in open source, community-driven solutions that increase the circulation of and access to knowledge.

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