

# “Bundle of Sticks” and the Value of Interdependence: Building a Tools and Services Collective

KATHERINE SKINNER, CATHERINE MITCHELL, KRISTEN RATAN

## Introduction

In “Bundle of Sticks,” a famous fable credited to Aesop, a parent gives three children a bundle of sticks and challenges each to try to break that bundle. None succeed. Then the parent asks each child to break a single stick from the bundle, and, of course, each easily accomplishes this task.

The moral is clear: our strength as individuals lies in our ability to work together to tackle big problems. But there is another moral here, too, and this one might resonate more quickly with our electronic publishing audience: bundles are powerful forms and, once created, are notoriously difficult to break.

Bundling as a business approach has been used to great success by large, conglomerate publishing and digital services (and at great expense to the academy). For decades, libraries and smaller publishers have witnessed the strength and resilience of this model. They have also experienced the damaging impact of its outsized, overpriced, and overly standardized offerings on academic institutions.

By contrast, independence has been among the most prevalent characteristics of smaller nonprofit, commercial, and academy-based publishing and digital services. Their business models have prioritized innovation and bootstrapping behavior, yielding a diverse array of promising but small-scale offerings that compete with one another for scraps of funding, time, and attention. These independent “sticks” are mission driven and responsive, and they increase access to academic publishing for authors and readers alike. But their siloed offerings are fragile and all too easily broken.

The Next Generation Library Publishing (NGLP) project is studying and piloting a third path: the conscious pursuit of *interdependence*. We are trying to match the resilience of the bundle while retaining the diversity of the individual sticks. In order to do so, we are exploring ways to scale up and unite myriad siloed, mission-driven tools and services. We want to demonstrate what a well-structured union of tools and services could accomplish, both technically and as an overarching collective business framework.

Herein, we raise questions about how bundling and independence show up in the scholarly publishing industry today, both for large conglomerates and for smaller commercial and nonprofit players. We then contemplate what interdependence might look like and how it might help to transform academic publishing. We end with findings from the NGLP project (2019–2022) and its Collaborative Frameworks Working Group regarding a set of initial steps that we believe publishers, tool developers, and service providers might take together toward developing a collective publishing framework for open source, values-aligned tools and services.

## Bundled, Closed, and Integrated

In the field of scholarly publishing, bundling as it is practiced today is deeply strategic. Large commercial publishers have long used the bundle as a powerful mechanism for selling digital content in unbreakable groupings. The bundle serves a dual benefit for the publisher. It reduces publisher expenses through standardizing offerings; it also increases publishing revenues by compelling libraries to buy more content than they want at higher prices than they can afford. The economies of scale produce high profit margins that benefit shareholders and are not passed along to academic institutions, researchers, and funders as price reductions.

More recently, large commercial publishers have also popularized another type of bundling, this one in the form of digital services. The most successful publishers today are giant conglomerates that regularly buy up and forge together chains of tools, changing them from relatively small and independent entities (e.g., Mendeley, SSRN, Digital Commons, Aries Systems, F1000, Knowledge Unlatched) to bundled-up scholarly communication offerings that are owned and controlled by a single corporation.

In so doing, these large commercial publishers are leveraging their resources to aggregate the many disparate tools and services their clients need into smooth, uninterrupted workflows and, simultaneously, to aggregate usage information for their own business intelligence and additional product development. They secure their market advantage through the age-old practice of acquisition and integration. Currently, a handful of multinational corporations own and control most of the infrastructure supporting scholarly research and publishing—along with most of the academy’s research outputs.<sup>1</sup>

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1. See, e.g., Vincent Larivière, Stefanie Haustein, and Philippe Mongeon, “The Oligopoly of Academic Publishers in the Digital Era,” *PLoS ONE* 10, no. 6 (2015), <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0127502>; and Alejandro Posada and George Chen, “Inequality in Knowledge Production: The Integration of Academic Infrastructure by Big Publishers,” *ELPUB 2018* (June 2018), <https://hal.archives-ouvertes.fr/hal-01816707v1>; and Roger C. Schonfeld, “Big Deal: Should Universities Outsource More Core Research Infrastructure?,” Ithaka S&R issue brief, 2018, <https://doi.org/10.18665/sr.306032>.

The industry consolidation represented by these bundling activities reduces competition and reinforces commercial entrenchment, narrowing options and opportunities (who can publish and where; who can access publications and how) and increasing data intelligence in potentially dangerous ways (usage data and predictive analytics).

This acquisition-and-integration model of bundling offers efficiency, no question, but the strategy of absorbing distributed tools and services into a single workflow (and, often, a single business model) also threatens to diminish the important distinctions among the sticks in the bundle. One pertinent example of this risk is Elsevier's 2017 acquisition of bepress. Though bepress retained its branding and services in the wake of that acquisition, its role within the scholarly communication landscape was compromised. No longer was bepress a scrappy player in the library publishing space, born within academia and supporting institution-based alternatives to commercial publishers. It became, in that moment of acquisition, the agent of a conglomerate publisher. For the publishing community, the values and principles underpinning that platform underwent a cataclysmic shift.<sup>2</sup> Using bepress Digital Commons became an ethical dilemma and risk—for example, for those who were concerned about how usage data about their authors and readers would be integrated into Elsevier's business intelligence or shared with government officials without knowledge or informed consent.

In other words, while these forms of bundling by conglomerates may serve to align a set of sticks (content or services), they accomplish this alignment by centralizing a set of previously independent and distributed resources (tools and services from many creators) under a single business structure. This act of acquisition and integration, while strengthening the commercial offering, ultimately undermines the productive diversity represented by the sticks collected in the original bundle.

## Open, Unbundled, and Independent

Coexisting with these large conglomerates, independent publishing tools and services (sticks) pepper the academic publishing landscape. These include a wide array of open source (OS) technologies and (usually) nonprofit services developed by scholars, publishers, and librarians that focus on specific functions in scholarly communication, including creation, evaluation, publication, distribution, reuse, and preservation.

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2. Paul Royster, Roger Weaver, Marilyn Billings, Phillip Fitzsimmons, and Terri Fishel, "DigitalCommons Users Discuss the bepress Acquisition," *Copyright, Fair Use, Scholarly Communication, etc.* 84, May 22, 2018, <https://digitalcommons.unl.edu/scholcom/84>; and Heather Joseph and Kathleen Sherer, "Elsevier Acquisition Highlights the Need for Community-Based Scholarly Communication Infrastructure," SPARC, September 6, 2017, <https://sparcopen.org/news/2017/elsevier-acquisition-highlights-the-need-for-community-based-scholarly-communication-infrastructure/>.

These independent OS tools and services represent some of today’s most innovative efforts to transform and improve access within the publishing landscape. They actively seek to support more inclusive publishing models and modes of scholarly communication, including meeting the needs of underserved/underrepresented authors, readers, and topical areas. From Islandora to Open Journal Systems (OJS), and from Fulcrum to LOCKSS, the most successful of these OS tools and services galvanize institutions and engage in multi-layered development activities, supporting community engagement and distributed governance alongside the actual code or service offering.

Although the longevity of some of these tools and services speaks volumes about the resilience they can have (e.g., both LOCKSS and OJS date back to the 1990s), these are still relatively fragile tools with thin margins, supported by small communities of practice. They compete with one another for members/clients, for funding, and for attention. Some are hugely successful in terms of adoption and use, but they simultaneously have so few resources that they cannot adequately staff their operations, pay off technical debt, or keep up with the pace of development happening around them.

So, while their independence enables these technologies the agility and freedom to align their service offerings with the specific needs of the communities they serve, it also often results in serious sustainability challenges (i.e., unstable or unsupported infrastructure) as they cycle off grant funding and work to establish business models that will serve them over time. The distinctiveness that they bring to the community is, in other words, both blessing and curse.

Even unbundled, these open source solutions and their communities offer a compelling glimpse of a possible alternative to today’s overwhelmingly profit-driven and locked-in scholarly publishing landscape. But their independence also exposes them as fragile sticks, each one easily broken by a shift in institutional priorities, change in leadership, or the kind of funding fatigue that currently plagues academic libraries.

### **Proposed Solution: Open and Interdependent**

Is there a way to pursue the strength made possible via integration without sacrificing the diversity of perspective, approach, and voice enabled by independence? Is there a midway point on the spectrum between these distinct models where independent tools and services embrace interdependence by agreeing to intentionally standardize and streamline their offerings so that the pieces fit together better, both technically and fiscally? And if so, what specific, small steps can we take toward this big goal? How can

we incentivize academic publishers, tool developers, and service providers to align and move as a collective effort toward those goals at scale? These are among the key questions with which the NGLP project has been grappling.<sup>3</sup>

The solution we propose and are currently testing in the NGLP project is *interdependence*. To be sure, this concept is neither new nor novel; it has long been discussed by librarians, funders, tool developers, service providers, and publishers in various settings.<sup>4</sup> Moving from discussion to action, however, has proved challenging, in large part because funding and reward structures continue to focus on simpler, one-off, or shorter-term initiatives. We have thus far lacked adequate scaffolding to incentivize and reward teams and technological solutions that work in truly interdependent ways.

Interdependence, in its purest form, is a mutually beneficial relationship that empowers and enriches the work of all entities involved. Interdependent relationships arise and thrive when a set of independent players come together as partners because they need something that they can only create together.

Rather than bundling a single set of solutions to corner the market (integration) or encouraging a wealth of single-faceted initiatives that compete with one another from siloed locations (independence), a model of interdependence encourages the growth and development of distinct technologies whose strength and stability are enhanced by the voluntary partnerships and shared service models established among them.

An interdependent approach to academic publishing would allow for targeted solutions for distinct communities. It would include developing and upholding the standards and frameworks necessary to enable modular recombinations of tools and technologies to serve needs as they arise. There is no single publishing workflow or toolset that can address the distinct methods and practices of scholars across the academic spectrum. The landscape of publishing solutions should provide a smorgasbord of options that can be combined and recombined in ways that reflect and support the diversity of author and reader needs and practices.

Such interdependence isn't accomplished through goodwill and good intentions alone. It requires independent entities to agree to balance the very real needs of their solo endeavors with the needs of the collective and to actively and continuously calibrate their own activities so that they support both. Interdependence has to resonate

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3. We are, of course, not alone in these queries. We are especially watching and/or participating in Invest in Open Infrastructure, Open Knowledge Community, and a range of data trust and data exchange initiatives. We are also watching groups such as the Global Sustainability Coalition for Open Science Services (SCOSS) and the range of work underway via Horizon 2020 (e.g., HIRMEOS and OPERAS).

4. Recall the Institute of Museum and Library Service's National Digital Platform concept, as just one example: <https://www.imls.gov/publications/national-digital-infrastructure-and-initiatives-report-2017-national-digital-platform>.

with those who bind together in a collective, not just as an ideal but also as tangible benefits that each member of the collective can see and feel and value.

## Steps toward Interdependence

There are serious barriers to embracing interdependence in our academic publishing landscape today. Tool developers, service providers, and publishers currently lack the resources and incentive structures necessary to enable, much less encourage, an interdependent approach. Recalibrating the way we invest in infrastructure elements, including the publishing tools and services of concern to the NGLP project, will require substantive work that is beyond the scope of this project but is getting underway in related initiatives such as Invest in Open Infrastructure.

Our current project is piloting an approach with a limited set of players on a very concrete (if still complex) case study in interdependence: **improving the publishing pathways and choices available to authors, editors, and readers through strengthening, integrating, and scaling up scholarly publishing infrastructures to support library publishers.**

To achieve these goals, NGLP is constructing a framework for the following:

1. **Vision.** Offering a collective vision that engages tool developers, service providers, and library publishers with a shared sense of purpose. This cannot be based on platitudes; it needs to offer measurable indicators of alignment.
2. **Tools.** Providing tools to help guide tool developers, service providers, and publishers toward this vision and to help them demonstrate their ongoing efforts to improve their alignment with the vision.
3. **Relationships.** Facilitating interactions between these entities, providing opportunities for each player to demonstrate how its work supports and benefits from an interdependent and collaborative network.

### *Vision*

Our first step toward assembling this Collaborative Publishing Framework has been to establish a compelling vision. In order to do so, we spent the first 15 months of project work engaging as many library publishers as possible in conversations about what they need and want in their technical solutions and infrastructure for library publishing. We heard strong and consistent responses across surveys, focus groups, workshops, and interviews, not just regarding the specific tools and services they seek to use but

also regarding *how they want the tool developers and service providers with whom they work to act*.

The theme of mission alignment and values alignment arose repeatedly in these conversations, and this, accordingly, became a grounding element for all of our work.<sup>5</sup> Library publishers want the technology and service providers that they can rely on to consciously strive toward stronger alignment with core values, including transparency; openness and interoperability; representation in governance; anti-oppression, diversity, and accessibility; and organizational resilience.<sup>6</sup>

Library publishers also consistently asked for infrastructure that improves both the delivery and display of published content and the administrative experience of managing that content and tracking its use. They emphatically urged us not to reinvent what already exists (e.g., institutional repositories and publishing systems such as DSpace, OJS, and Janeway) but instead to build interactive pathways *between* these systems to unite and modernize the experience of using them.

The vision for our Collaborative Publishing Framework has arisen directly from these conversations and prioritizes (1) modular technology with strong UX features for combined IR/publishing functionality and (2) clear expectations that all participants and elements within the framework will seek to align with specified values.

## Tools

Values alignment measures are being formalized in Educopia's FOREST Framework for Values-Driven Scholarly Communication (March 2022), which we hope will serve as a touchstone for the diverse set of projects, tools, services, and standards in the emerging open publishing network. This framework provides a set of criteria for entities to measure their progress in moving toward norms of openness, transparency, and accountability with fair and sustainable business practices baked in. Our initial assessment with our project partners shows that, while most of the stakeholder projects involved with

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5. See Katherine Skinner and Sarah Wiperman, "Living Our Values and Principles: Exploring Assessment Strategies for the Scholarly Communication Field," Educopia Institute, October 21, 2020, <https://educopia.org/living-our-values-and-principles/>.

6. We know we are not alone in prioritizing values alignment; many other groups have been exploring this area as well. To bring these together, we hosted a half-day summit in February 2022, "Aligning Scholarly Communication Values and Principles Approaches," to evaluate the synergies and differences in our collective intentions and approaches. The summit included representatives from CARE Principles for Indigenous Data Governance (Global Indigenous Data Alliance), Jus-sieu Call for Open science and bibliodiversity, GO FAIR (FAIRification), CoreTrustSeal, The Principles of Open Scholarly Infrastructure (POSI), Good Practice Principles, An Ethical Framework for Library Publishing (LPC), Invest in Open Infrastructure, PAPPI Publisher Evaluation, Think. Check. Submit, Principles of Transparency and Best Practice in Scholarly Publishing (OASPA, COPE/DOAJ/OASPA/WAME), Force11 400+ Principles, and HuMetricsHSS Values Framework.

NGLP have work to do to fully realize their aspirations in these areas, they share significant alignment in their desire to get there eventually.

We encourage the use of the FOREST Framework by tool developers, service providers, and publishers who are interested in engaging in more interdependent activities in conjunction with the library publishing community. They can use the FOREST Framework to examine their current operations and business practices, assess how these align with documented values and principles, and plan toward ongoing improvement of their alignment over time. They can also use this framework to evaluate potential partners and to be more deliberate about how they want their work with external groups to align with the values espoused within this field.

Also based on our vision work, the NGLP team determined that modular publishing solutions, supporting flexible service models, would best satisfy the needs of multiple segments of the library publishing community and decrease this market’s dependence on any one platform or provider. The NGLP team selected to focus on the build of two specific software components to aggregate content and data from widely adopted open source platforms to create end-to-end library publishing solutions. The **Web Delivery Platform (WDP)** facilitates unified content management, discovery, and display while the complementary **Analytics Dashboard (AD)** allows workflow and usage data monitoring and reporting.<sup>7</sup> In the forthcoming pilot work in 2022, the WDP and AD will be deployed with a leading OS IR tool (DSpace) and two leading OS publishing tools (Janeway and OJS).

Notably, we are strongly committed to the free and open reuse of software components produced by the NGLP project. This commitment is reflected in the choice of licensing for the two components and associated documentation: both the NGLP Web Delivery Platform and Analytics Dashboard are built as open source software, licensed under the MIT License. The MIT License is considered a permissive open source license with limited restriction on reuse of the software. All project development outputs are made immediately available in our NGLP GitHub Repository.

### *Relationships*

Relationships can be challenging in the academic publishing arena. The tool developers, service providers, and publishers within this domain are often both collaborators and competitors; we generally agree with the fundamentals of one another’s work but

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7. These builds were formally commissioned by the NGLP project and are currently under development with Cast Iron Coding and Cottage Labs, two development partners chosen through RFP and review processes in August 2020. Discovery work and iterative development cycles ran from August 2020 through February 2022.



might vehemently disagree about some of the details. But we also all need one another because our independent, siloed work is simply too fragile to scale. We believe it is time to reconceptualize how we work together and how we invest in our work together.

NGLP has offered a home for defining the collective strategic goals that reflect what the library publishing community has said it needs. It has convened, facilitated, and built coalitions among the key stakeholders within that community and the broader open source landscape. It has commissioned software development to fill key gaps in open source tools and services and is funding work to improve interconnectivity between platforms and tools.

Alongside the development of these crucial vision and tools elements, we are working to strengthen and deepen the relationships among the tool developers, service providers, and publishers engaging in this work. Together, we are creating business modeling and governance concepts that stretch across independent entities and encourage interdependence. This work requires that we find ways to cultivate trust and establish financial sustainability for all of the platforms and services involved.

Our project has engaged a Collaborative Publishing Frameworks Working Group to help chart the relationships among participating tool developers, service providers, and publishers, particularly in terms of financial contributions, code contributions, and community engagement work.

We are building on existing models and engagements that have been deployed between a tool/development team and other entities that host services based on that tool (e.g., DSpace's Service Provider Program or Crossref Service Providers). We are working to define what a fully realized collective publishing framework might look like and what impact it could have on the way knowledge and information are packaged, shared, and analyzed in the future.

We are currently working to build a strong model that includes concrete expectations of transparency and support from service providers to their clients/customers and to the OS tools they build upon. We are developing a straightforward set of levels and milestones for service providers based on their gross annual revenue, staffing levels, and the number of clients they serve. At each level, the service providers will be expected to provide a percentage of gross annual revenue and/or in-kind developer time and documentation to each of the open source tools they use. For example, if a service provider uses DSpace and Janeway, along with the Web Delivery Platform and the Analytics Dashboard, there will be reasonable and concrete expectations for how they should engage with each of these tools and their governance structure.

By tying this framework back into the Values and Principles Assessment Toolkit, we hope to make clear and transparent the terms that service providers are expected to uphold and also, to their own stakeholders, whether they are complying with these expectations. This work will be ongoing throughout the third year of the project. We

also hope this model will be extensible to and adopted by other OS tools used within the academic library sphere.

## Conclusion

To return to the metaphor with which we began, bundles are unquestionably strong but, in the case of scholarly communication, their strength more often results in vendor lock-in and disproportionate revenue generation than in powerful, values-aligned, affordable publishing solutions for the scholarly community. At the same time, distinct and siloed open source technologies, while often values driven and low cost, generally do not have the services integration or staying power (sustainability) as individual sticks to rival these bundles. Too frequently, they founder under the weight of their own ambitions and limited resources. NGLP’s focus on fostering a framework for productive interdependence offers a third path—one that recognizes the importance of reliable, well-resourced platforms; the productive distinctions that can arise in unaffiliated technology projects; and the necessity of aligning these efforts to create cooperative, mutually beneficial relationships that distribute resources and provide robust publishing services suites for scholars and library publishers. Rather than buying things that are yoked together in commercial bundles, let’s instead build webs of synergistic tools, values-aligned service provision, shared resourcing, and collective governance. The work is not easy or uncomplicated, but it is the kind of thing we have to do if we truly want to transform scholarly communication.

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