Costs & Benefits of Collective Investment

Future of Open Scholarship: Brief

May 2021

IOI

Future of Open Scholarship: Costs & Benefits of Collective Investment

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Executive Summary

All too often we lack a shared frame to discuss open infrastructure actions, and their impacts on quality, performance, usability, and risk. For this reason we created a cost-benefit model — a shared resource to look at the financial impact of open infrastructure and collective processes. In this exercise, we have generated a preliminary tool which can help us to model what was previously unquantifiable, such as fungible hours, management improvements, risk and variable funding approaches. Built as a flexible spreadsheet, it is designed to help us to see the sensitivity of financial performance to specific cooperative moves, such as using standards, negotiating rates, and using pooled hours. It will eventually let us look at both individual institutions and the collective as a whole.

As a collective, we are now better able to call for more transparency within and across our institutions —to adopt a cost-benefit mindset. We are better able to frame open infrastructure as a highly-functioning, flexible service, not a cheap substitute for commercial software. And, we are better able to see the potential benefits from our collective — sharing knowledge, bargaining as one, and providing better services to researchers, scholars, and citizens.

Perhaps the most important value of the model is that it can serve as a communication vehicle to work with leaders in our institutions and funding organizations on their own terms.

We welcome input from the reader of this report.

This report is accompanied by:

- Cost and Benefit Model (for discussion)
- Feedback Session Slides (Feb 2021)
- Model Summary
- Shared Project Folder

Highlights include:

- What we modeled
    - Patterns of cost and beneficial impacts
    - Assumptions
    - Estimated Costs and Benefits
    - Graphic of Benefits Over Time
    - Model Scenarios Summary
- Input from industry experts
- Preliminary findings

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1. Introduction

This work builds on the research and participation conducted as part of the Future of Open Scholarship project, an effort involving 112 participants from over 75 research and scholarship organizations around the world. The aims of this work were to develop a shared resource to assess the financial impact of open infrastructure investment, designed to spur the following uses and explorations:

1. **A communication tool for budget holders** looking to make a case internally for investment in a particular open infrastructure solution (e.g., migrating off a commercial, closed solution, looking to augment their casemaking with data and support of a model)
2. **An assessment lens** for those looking to better understand the impact of their own contribution to open infrastructure (e.g., cash, staffing, other forms of in-kind support - how does that affect rates, returns, collective benefits)
3. **A planning tool for broader collective action** to examine rates, efficiencies gained, areas for additional investment (e.g., consortial investment in a shared solution, means to map various funding scenarios and strategies to support shared infrastructure)

The critical findings from this work so far are:

1. Shift mindset from cost-reduction to investment
2. Think as a cooperative
3. Model scenarios, not budgets
4. Drive for transparency across institutions and the ecosystem
5. Drive for transparency within institutions

We have proposed a multi-institution modeling process that at once *models* the collective, and *is* collective. It is designed to ladder up to a larger collective lens. Thus, the aggregate model will be able to represent the sum of benefits and costs over a period, showing the dynamic between concurrent net contributors and net beneficiaries. At the same time, the concurrent modeling of each funding scenario, impacting individual institutions simultaneously, will enable IOI to justify funding amounts and timing to both funders and institutions.

2. Research overview

This summarizes the research context, including the stakeholders and the value of the collective.

2.1 Key stakeholders for the model

There are three major stakeholders for this work.

- First are practitioners, collaborators and advocates. They can use the model (and, ultimately summar data across institutions) to argue for open infrastructure's economies of scale and focus on standards. They can also use the model for gauging cost-ranges for open infrastructure and participation.
- The second stakeholders are the funders and institutions. They can learn from other institutions' model inputs, and can benefit from seeing the big picture of costs and benefits across an

institution. Once the model is properly indexed for their institution, they also can better understand the costs and benefits of open relative to commercial infrastructure.
- Third, and not least, are the researchers, scholars, instructors, students, and library staff. They benefit from standard user experiences, operating models, paywall indicators, and research terminology. They are the big winners when open infrastructure collectives reduce customization, increasing speed, and improving clarity.

2.2 *The power of a collective approach*

This work builds on the research and participation conducted as part of the Future of Open Scholarship project, an effort involving over 115 participants from over 75 research and scholarship organizations around the world. We cross organizational boundaries, share knowledge, and seek to capitalize on our diversity, reach, and local ingenuity. In a word, we are a *network*.

Network research has shown that there are four generic network objectives, and the choice of objective should trigger specific design moves (Pugh and Prusak, 2013). Broadly speaking, network objectives are about co-creating economic benefits or sense-making:

1. **Innovation and production.** Build and develop open infrastructure products, services.
2. **Horizontal cooperation.** Applying the scale, buying power, intellectual strength, collective reputation to purchases, standards, and influence.
3. **Member support.** "Just-in-time" support for members, troubleshooting, peer support.
4. **Translation and adaptation.** Exploring transferability of ideas from institution to institution, domain to domain, outside the collective to inside the collective.

The first two are economic benefits, and the second two are about sense-making. For the open collective, these translate into different ways of engaging, creating psychological safety, and teaming. Design follows directly. First, the leadership's role, the community norms, and membership criteria get defined to support these goals. Then come the operating models, roles and responsibilities, decision-making, engagement routines and metrics.

For example, if the collective's goals are defining and ratifying standards with NIST (innovation and production), community routines will look more like project management. Conversely, if the goal is to help a member strategize how to convince their leadership that now is the time to invest in open, community norms could involve trust-building practices and role-playing. If the goal is to come together with fuzzy institutional "ballpark" estimates for comparison (translation and adaptation), community routines might look like confidential benchmarking.

2.3 *What is the overall process and where does it stand today?*

The modeling workflow involved two workshops with 22 project participants, follow on interviews with other key stakeholders (including both participants in this research effort as well as other external industry and domain experts), as well as testing with key stakeholders on an individual basis as well as a group in February 2021. The overall arc of the modeling will have three components: Justify. Make this model workable for project participants, justify open infrastructure investments by showing a realistic return (qualitative and quantitative) over the next 5 years. Fortify. Assist in benchmarking, compare benefits, rates, strategies, etc. Expand. Perform scenario analysis (e.g., one time cash infusion, federal

budget line (supported infrastructure like electric cooperatives). These are presented in greater detail below.

At this writing we have completed the "justify" stage. At the fortify stage, participants will be able to benchmark against each other, and we will see the cumulative benefits over a multi-year period, where individual institutions' point-in-time benefits differ, while the aggregate demonstrates improved performance. However, participants can use the model to explore the impact of different combinations of funding scenarios and performance scenarios. (See Scenarios below.)

3. Infusing an outside view

To help inform this work, we consulted with a number of industry experts in domains adjacent to those represented by the participants of this project. These interviews provided a foundation for developing the model detailed here and supplied additional examples of business models, implementation challenges, and forms of cooperation to explore for this effort. (Please also see References., below.)

- For-profit use of, and advocacy for, open source (Ref: Deloitte; Gil Yehuda, USBank).
    - *Preliminary Observations: Open source program office (OSPO) models are stabilizing, standardizing, and seen as an incubator for technical talent.*

- Cooperatives as a powerful counterweight (Ref: Eric Deluca, NCBA CLUSA).
    - *Preliminary Observations: Cooperatives have wide bi-partisan support and lessons learned on topics of bargaining, contracting, and lobbying.*

- APIs (Ref: McKinsey & Co.)
    - *Preliminary Observations: APIs, particularly public APIs, create interoperability, portability, and entrepreneurial behaviors. (McKinsey, 2020)*

- Standards (Valerie Sichi-Krygsman, former manager with American Society for Quality, ASQ)
    - *Preliminary Observations: For OI, standards enable equity, stability, security, credibility, and quality. Yet, they can take 5 to 8 years. Guidelines are interim options. The collective may want to engage in the standards process for competitive intelligence, skill development networking, and prestige.*

- Buy versus build (various modelers)
    - *Preliminary Observations: Using standard criteria for "buy versus build" (risk, stability, lock-in, interoperability). We have designed the model around the concept of buy versus build, and have estimated benefits such as flexibility, absolute labor rates, stability, and interoperability.*

4. Developing a costs and benefits model for collective investment

This working financial model is designed to enable users to better understand productivity/quality improvements from the open source development model for infrastructure, discounts from cooperative buying, improved sustainability/reduced risk from resource smoothing or single-provider reliance, and

explore future economic scenarios for the collective (e.g., cash infusion, contributions from members and how that affects costs and benefits, and subsidies).

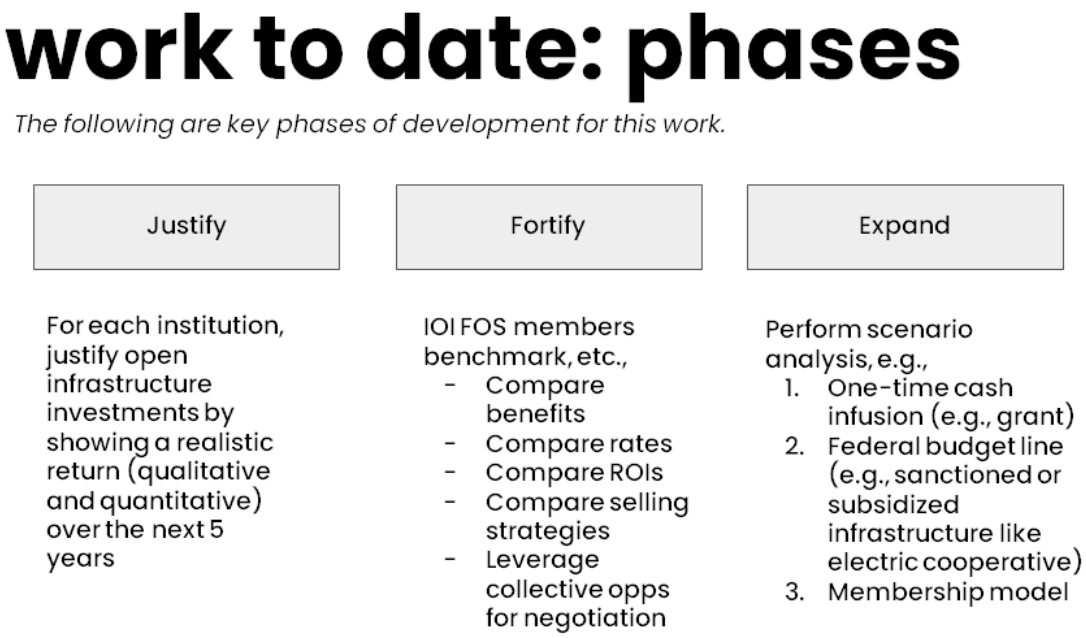
4.1 Methodology & approach

There are three main phases to this work:

- **Justify.** For each participating institution, explore ways to help justify their open infrastructure investments by showing a realistic return (both qualitative and quantitative) over the next three years. This phase helps outline opportunities and needs to support institutional leaders in advocating for continued investment in shared open infrastructure to benefit their students and faculty.
    - This phase includes (2) model development workshops (Dec 2020), a series of additional participant and external party interviews (Nov-Dec 2020), and rounds of testing and iteration through workshops and one-on-one calls with key stakeholders (Dec 2020 - Feb 2021).

- **Fortify.** Participants benchmark and index costs and variables. This phase includes comparing benefits, rates, selling and purchasing strategies, and explores ways to leverage shared advocacy communities. We propose: indexing of the model by multiple institutions. Define "typical" types of Institutions. We recommend running multiple institutions' models either where the administrator sums individual institutions (and multiplies their output by the expected number of institutions of those "types" or run a simulation game where the actions of one or more institutions (e.g., willingness to donate in kind) may improve or constrain options of remaining institutions (e.g., performance of software or speed of projects).

- **Expand.** Perform scenario analysis and test with participants to further build out assumptions for the model, especially the funding approach for the model. We recommend modelling funding flows with the group. We have already modeled the one-time cash infusion (e.g., a grant); smaller contributions from institutions, and sustained subsidy (e.g., federally/nationally supported infrastructure). An expanded model could model the impacts on individual institutions, and the collective benefits to groups of institutions and to society.



4.2 What we modeled

We modeled patterns of benefits over a five year period. These benefits come from a variety of open and collective efficiencies, reductions in risk, and improvements in operations. We have also included simplified funding models (economic scenarios bringing money in), that permit smooth or lumpy external or internal contributions.

We chose to use a **five year modeling period** in order to include enough years to accommodate startup periods for new software, but not go out so far as to step beyond typical institutional strategy timeframes. We did not initially include discount rates for investments or costs that occur in out-years given the current low interest rates and added complexity.

As stated, the model is initially addressed to an individual institution. The goal is to aggregate multiple institutions' data to see mutuality. That is, gains an institution sees in one period could be subsidized by the collective, followed by investments by an institution in another period, being accompanied by gains by others.

The following items are important to note about the design of this model:

1. This contains reasonable, but not verified rates. Rates will be validated with the collective, and some will be unique to institutions or open infrastructure projects.
2. We did not apply discount rates to the "out years" of the model. This could easily be added, but for simplicity (and in a low-interest market) we chose not to do that at this time.
3. We calculated the benefits of both open infrastructure and the collective, as a difference over to a primarily commercial base case, year after year. We did not calculate a return on investment, or

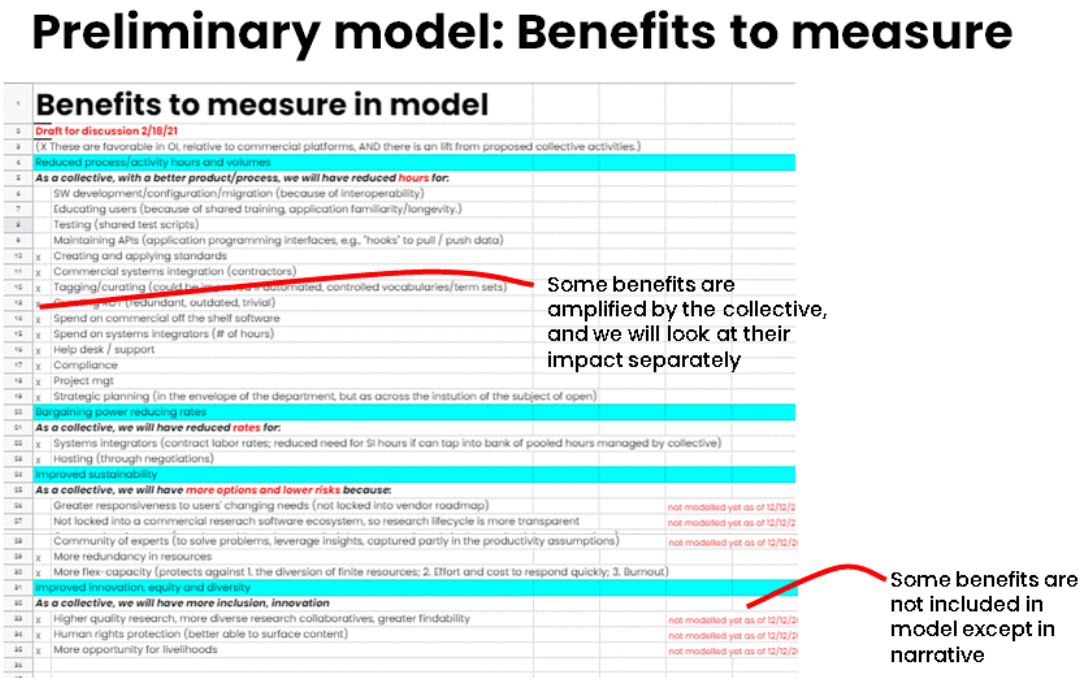
"ROI," because both "I" and "R" are complex. For example, while we could estimate benefits versus dollars invested from the collective we'd have to ask which investment? For example, the collective labor or funds from a donor? And we'd also ask about benefits beyond improved rates and standards, It is not reasonable to estimate the non-productivity returns from the entire open infrastructure enterprise -- such as research content, community, grant info, or cultural heritage.

4.2.1 Benefits to measure

The main categories of value we sought to measure were:

- Reduced process/activity hours and volumes. (This is due to better use of standards, APIs, and common approaches.)
- Collective bargaining power that reduces prices and labor rates.
- Improved sustainability and utility. (Examples include. less vendor lock in, more redundancy, more flex capacity, reduced burnout)
- Improved equity and diversity. (This includes human rights, diversity, equity and inclusion; the possibility for more diverse livelihoods. This was not modelled directly, but the cross-subsidization scenarios could begin to address this. .)

In sum, we measured productivity, innovation, and risk reduction (e.g., reduction in staff burnout) are captured as lower costs. (Revenue could also be included if there were an internal transfer price for services delivered across departments in an institution.)



🏃 *Sheet: "What to model": This sheet describes the benefits, in terms of improvements in costs (due to changes in structure, changes in rates). The sheet provides items that we were able to model ("X") and some that would either need to be added or discussed qualitatively.*

4.2.2 Assumptions

The quantitative assumptions are labor rates and cost-decay rates (or benefits accrual rates) that the institution can input, so that they can align it with their institutional rates and expected open infrastructure benefits. Note that we are using fully-loaded rates. That means that we have added the overhead costs of insurance, other benefits, physical space, debt service, and equipment. In the list of quantitative assumptions we've included "economic scenarios." The economic (funding) scenarios are the flows of investment in the collective, and which show up in the individual institution's model. They could come from members or outside. They could come in a bunchy way or spread out.

The workshops and interviews with the stakeholders contributed to the assumptions. The qualitative assumptions lie behind the model as statements of truth or simplications. Here is a detailed list of assumptions:

Qualitative assumptions

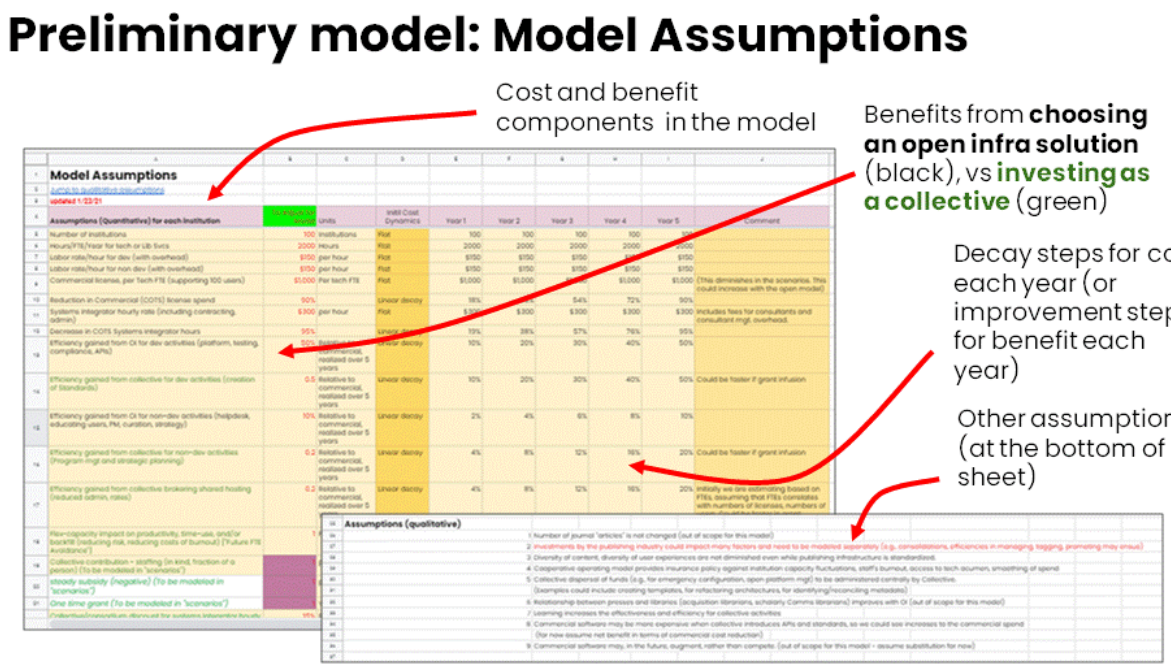
- Risk and Learning
    - Cooperative operating model provides **insurance policy** against institution capacity fluctuations, staff's burnout, access to tech acumen, smoothing of spend
    - Learning increases the effectiveness and efficiency for collective activities
- Content
    - Number of **journal "articles" is not changed** (out of scope for this model)
    - **Diversity** of content, diversity of user experiences are not diminished even while publishing infrastructure is standardized.
    - **Collective dispersal of funds** (e.g., for emergency configuration, open platform mgt) to be administered centrally by Collective. (Examples could include creating templates, for refactoring architectures, for identifying/reconciling metadata)

  Ecosystem
    - Investments by the **publishing industry could impact** many factors and need to be modeled separately (e.g., consolidations, efficiencies in managing, tagging, promoting may ensue)
    - Relationship between **presses and libraries** (acquisition librarians, scholarly Comms librarians) improves with OI (out of scope for this model)
    - Commercial software may be more expensive when collective introduces APIs and standards, so we **could see increases to the commercial** spend (for now assume net benefit in terms of commercial cost reduction)
    - Commercial software may, in the future, **augment, rather than compete**. (Out of scope for this model - assume substitution for now)

Quantitative assumptions (used in a model run)

- Rates
    - Number of institutions
    - Hours/FTE/Year for tech or Lib Svcs
    - Labor rate/hour for dev
    - Labor rate/hour for non dev

    - Commercial license, per Tech FTE (supporting 100 users)
- Productivity improvements and risk-reduction benefits
    - Reduction in Commercial (COTS) license spend [Note that we don't model vendors' monopoly-like behavior at different scales]
    - Systems integrator hourly rate (including contracting, admin)
    - Decrease in Systems Integrator hours
    - Efficiency gained from OI for dev activities (platform, testing, compliance, APIs)
    - Efficiency gained from collective for dev activities (creation of Standards)
    - Efficiency gained from OI for non-dev activities (helpdesk, educating users, PM, curation, strategy)
    - Efficiency gained from collective for non-dev activities (Program mgt and strategic planning)
    - Efficiency gained from shared hosting (reduced admin, rates)
    - Flex-capacity impact on productivity, time-use, and/or backfill (reducing risk, reducing costs/risks of burnout) ["Future FTE Avoidance"].
- Economic scenarios:
    - Collective contribution - staffing (in kind, fraction of a person) (To be modeled in "scenarios")
    - Collective contribution (monetary) (To be modeled in "scenarios")
    - Collective/consortium discount for systems integrator hourly rate



🏃 *Sheet: "Model assumptions": This includes assumptions for all of the quantitative and qualitative elements of the model, which then can be characterized for a single institution.* Notice that there are three FTE rates, one for a manager/librarian, one for a technology professional, and one for a third part contractor. Typically, the third party contractor is more expensive than the

fully-loaded labor rates for internal staff. *You can type in a target improvement percentage for five years, and then choose a flat or linear decay for the improvements in cost structure (performance). In red are the end-point percentages, such as the cumulative commercial license spend decrease over the years modelled.*

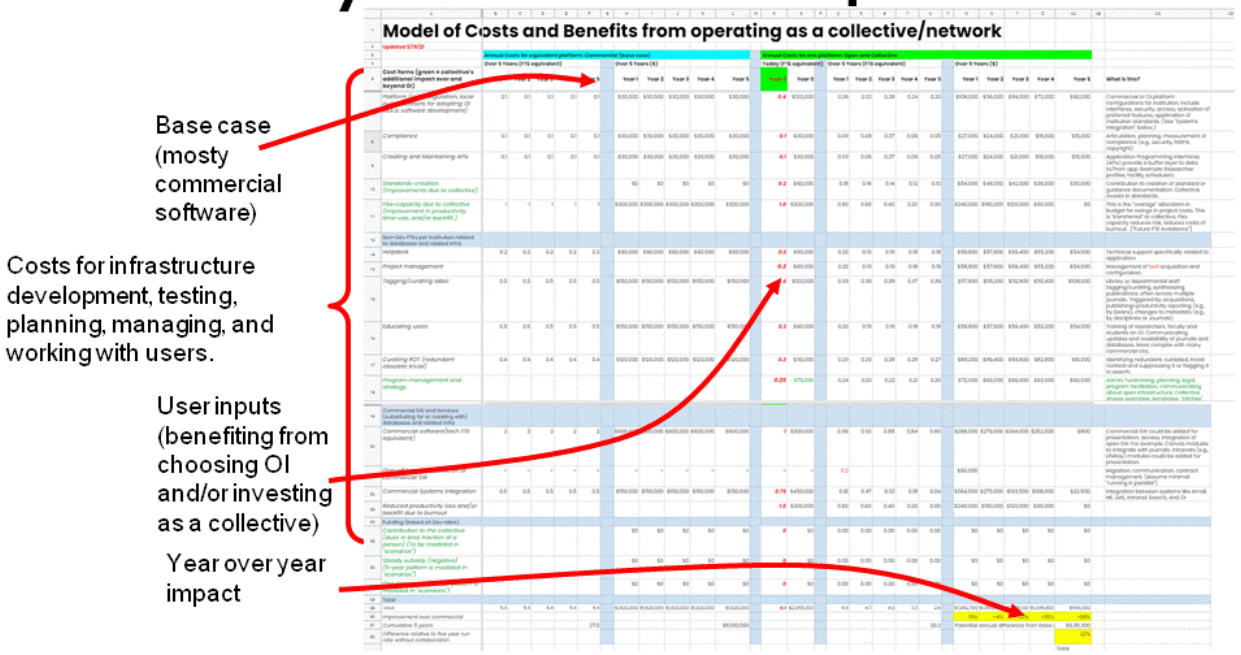
4.2.3 Model (estimate of costs and benefits)

In the cost and benefits analysis is a base case, which is primarily comercial, and an open infrastructure case, which is primarily open. The base case is used as a foil for the work on the right hand side.

Whereas the Assumptions sheet lets you put in labor rates and cost decay rates, the Model sheet allows you to put in actual quantities. Almost all of the inputs are measured in FTEs. For example, a .5 FTE writing code for an open infrastructure portfolio.

For simplicity we didn't include inflation or otherwise increase in the (generally more-expensive) commercial scenario. This keeps our estimates conservative.

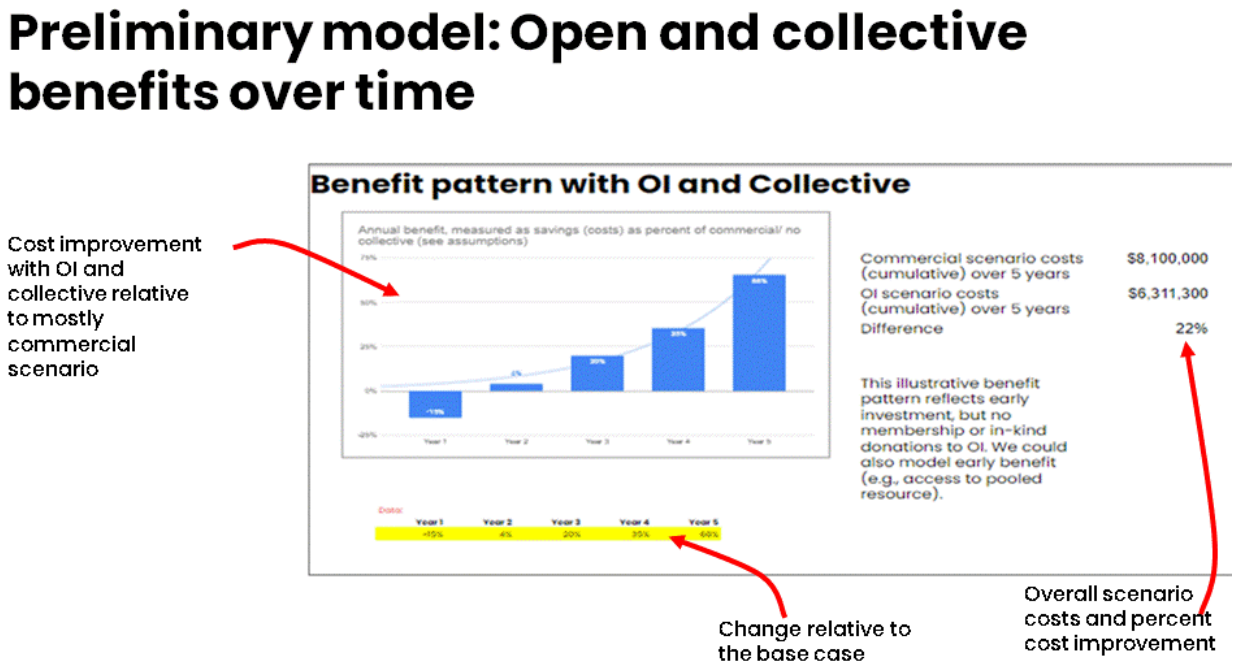
Preliminary model with user input



Sheet: "Model": This is the actual calculations, showing the commercial example as the base case on the left. At the lower right of the sheet you will see the year over year improvement relative to the base case, expressed as a positive number. *The benefits are calculated as a percent improvement over the commercial case, each year. Outcomes by year will be visible in the Benefit pattern.*

4.3 Graphic of benefits over time

To help with communicating the benefits of open and the collective, we have provided a graphic that shows benefits, by year, based on your assumptions. This also includes the total costs for commercial (base case) and the OI scenarios. The summary, year over year data which were calculated on the Model sheet are brought over here and graphed.



🏃 *Sheet: "Benefit pattern": This sheet shows the flow of value over the five year period. It also shows the cumulative difference between the non-open, non-collective model and the model that has both.*

4.4 Summary of model scenarios for funding and performance

In the Model Summary sheet we have tried out combinations of performance benefits (due to the open infrastructure, e.g., improving cost and discount structures and flexibility, and due to the collaborative, improving management, interoperability, labor de-risking, and standards), and funding scenarios. We look at individual institutions (" scenarios summary" tab) and aggregating institutions ("Simple analysis for donors"). For the cross-institution summary, again, using the 5-year horizon, we've used the data from the preceding tab to show a donor the relative benefit from:

1. No funding (no exchange),
2. Institutions giving in-kind benefits without external funding,
3. One-time funding,
4. Continuous funding

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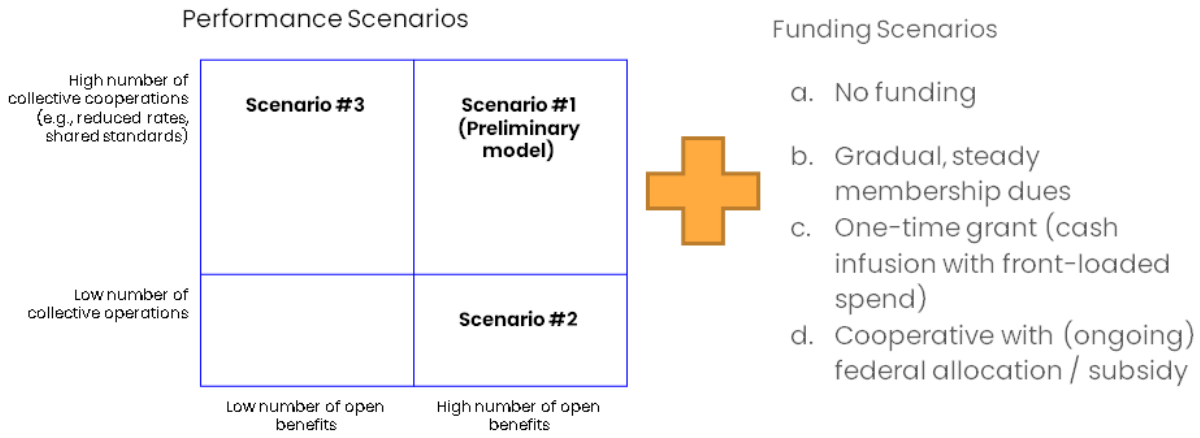
Funding and performance scenarios overview



Funding and performance scenarios data

Varying funding scenarios

Summary		A. No Funding		B. In Kind dues (10% of 1 tech FTE)		C. External 1-yr grant (10% tech FTE)		D. External N-yr subsidy (10% tech FTE)	
Open infrastructure benefits	Collective benefits	Cumulative 5 year costs	Improvement versus base case	Cumulative 5 year costs	Improvement versus base case	Cumulative 5 year costs	Improvement versus base case	Cumulative 5 year costs	Improvement versus base case
#1 High	High	$6,311,300	22%	$6,461,300	20%	$6,281,300	22%	$6,161,300	24%
#2 High	Low	$7,338,900	9%	$7,488,900	8%	$7,308,900	10%	$7,188,900	11%
#3 Low	High	$7,213,550	11%	7363550	9%	$7,183,550	11%	$7,063,550	13%

Varying performance of open infrastructure and the collective

*Separate Workbook "**Model Summary**" (Available upon request): Scenario Summary tab: This is a static document for now, but could be dynamically generated. This has three rows of graphics pasted from the model runs:*

Row 1: ALL BENEFITS: First row has all of the benefits, and we vary the source and cadence of funding. Dues could come from in-kind (labor), external 1 year grant, or external flat subsidy. In these scenarios we vary the dues and subsidies:
1b. 0.1 FTE in kind dues.
1c 0.1 FTE external grant
1d 0.1 FTE annually"

Row 2: THE COLLECTIVE'S BENEFITS REDUCTION: Second row shows reductions in collective benefits, and we vary the source and cadence of funding. Reductions could mean changing standards efficiency, management, hosting costs, flex capacity, systems integration discounts. In this scenario, we halve all of these efficiencies:
50% imp to 25% imp for standards
20% imp to 10% imp for program mgt & strategic planning
20% imp to 10% imp for hosting
1.00 FTE to .5FTE flex capacity/hiring costs/burnout mgt.
15% to 7.5% systems integration rate reduction"

Row 3: OPEN INFRASTRUCTURE'S BENEFITS REDUCTION: Third row shows open Infra benefits, , and we vary the source and cadence of funding. Open infrastructure benefit reductions include less-reduced systems Integration hours, lower development efficiency, and lower non-dev efficiency. In this scenario, we halve all of these efficiencies:
95% imp to 42.5% imp in commercial systems integrator
50% imp to 25% imp in dev efficiency
10% imp to 5% imp in non-dev efficiency (e.g., helpdesk educating users, etc.)

The two following graphics show the data summarized in a table (for each performance/funding scenario), and then the five year graphic, along with associated assumptions.

5. Preliminary findings

The model helped us to explore the overall economic performance for collective, open infrastructure. It has seen the financial rewards from collaboration (c.f., the network types above). The preliminary findings are about what to model, how to model, and how to use our collective data as an element of collaboration.

5.1 Shift mindset from cost-reduction to investment

Participants expressed a desire to focus on "value" from open infrastructure, and to get away from cost-savings. Open source participants often act outside of the traditional economic or accounting systems For that reason it's difficult to communicate true benefits. (Some would argue that "open" is a gift economy, and thereby modeling financials is a contradiction.) We claim that in order for us to communicate, we need to use the same language as institutional boards, funders, and accountants. The benefits are improvements in efficiency, reduction in cost variability, accessibility, reductions in

management or negotiation time, improved talent pools, learning, upskilling, and reduced burnout. Participants have also pointed to knowledge equity — getting open infrastructure, and knowledge, into the hands of lesser endowed institutions or nations.

What the community said:

"What's tricky about this modeling is that it implies to higher-ups that these savings will actually be realized as a budget reduction, when we'd like it to mean that the FTE reductions are now open to work on other impactful stuff."

"We perhaps need to have holistic ways to talk about "value" that include, but are not limited to cost savings. Something that costs the same, but is way better, _is way better_."

"Interfaces & interoperability: Can I pull my data in / get my data out? What does the user experience look like / enable?"

"I also like talking about risk reduction."

"[We're] talking about backwards compatibility with standards"

"Not just accessibility, but multiple forms of compliance"

5.2 Think as a cooperative

A key lesson from the process of modeling is that open collaborations should take a wider, dynamic lens. From a financial perspective, that means measuring both costs and benefits (such as efficiency, risk reduction, and busying leverage) and contributions to and from members over time. As we've used the discipline of estimates for inputs and outputs that are either monetary or in-kind, we can chart the economic impact over time. At any stage one collaborator may be a net-donor (e.g., of labor, insight), while another collaborator might be a net beneficiary. So, while the shape of the benefit curve for the collective may be a steady rise (and the individual institutions' net benefit is positive), individual institutions may experience differently shaped curves.

What the community said:

"[An] operating model would define 'banking' or 'withdrawal' of hours."

"Dealing with fractional changes over time (e.g., organisation has staff member contributing 20% to a common project; once that project completes, how does the org. fund that slice)."

"Putting a value to in-kind contribution and staffing"

5.3 Model scenarios, not budgets

In our model we considered a wide variety of scenarios on the input and operations side. We evaluated what we called "economic scenarios" (revenue/grant). We modeled the impacts of being part of a collective, (e.g., driving interoperability through standards and APIs and buying labor as a monopsony). We also looked at different, open software performance (i.e.., enabling the reduction of commercial products), and benefits of being part of a collective

🔊What the community said:

"Gone are the days of saying here's the budget, here are the assumptions. For this exercise - there are so many unknowns, I need to walk into any model with a range of potential outcomes.
1. Current budget and model
2. Things get better
3. Things are worse than we expect
4. Oh crap scenario

"Here's a minimum viable product approach."

"In terms of inputs: There is income from the community; there is income from outside the community (Grants, etc, though this is short-term and focused); and there are in-kind contributions."

5.4 Drive for transparency across institutions and the ecosystem

The boundaries of the model go beyond the individual institution and its local tech resources. It also includes institutions collaborating and interacting with the commercial sector. A critical benefit from the modeling exercise participants sought was the ability to learn from each other about best practices, cost ranges, insights, and messaging approaches. The benefit of benchmarking institutions is to know when one's cost ranges are quite different from others, including commercial alternatives (make-buy decisions). Additionally, opportunities for sharing resources may emerge, as brokered by the collaborative. This is a significant improvement, say the participants, as historically they have not had a single shared model for gathering and normalizing their distinct approaches and cost structures.

🔊What the community said:

"Would it be helpful for those who can, to share spends for the year 2020? I am happy to do that for our organisation if helpful."

"There's a space that whatever we're developing will meet the commercial domain, and how well they fit together / complement / create friction -- would love to have some understanding to help guide that."

5.5 Drive for transparency within institutions

Many institutions remarked that they didn't even know their cost structures themselves. Their open programming and management resources, as well as their commerce product and contract labor costs are often spread across institutions, or buried.

> 🔊What the community said:
>
> *"I don't even know how much time people spend...The model helps build discipline and a way to talk about what we're doing, even while acknowledging that a lot cannot be quantified."*
>
> *"Quote from my collections folks on this point:"how much money is being paid into APCs from NC State authors since no central unit on campus is doing this and the funding of that money happens (rightfully so, IMO) outside of our primary access channels, so we don't know how much the "money is talking" even in the context of no campus wide endorsement of open scholarship."*
>
> *"There's also a lot that's not happening during business hours that not tracking to "improve communities and the world of those communities."*
>
> *"Within institutions, some types of staff are less likely to track time than others."*
>
> *"In past experiences, was grant driven, when in kind was required as a match."*

6. Conclusion

The model provides a communication vehicle, a tool for exploring scenarios, and a resource for demonstrating evidence of collaboration's impact. It helps position open infrasture and the collective/network that supports it, as not operating outside the bounds of traditional accounting and investing, but within it. It helps look at benefits as far ranging as burn-out reduction and buying power.

Ultimately the model can be used as a vehicle for helping grow broad appreciation for open infrastructure beyond the research institutions and their current day funders.

7. References

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