LG-256726-OLS-24, Pennsylvania Academic Library Consortium, Inc.

Sustaining the Hyku Repository Platform: Addressing Hyku's Unique Community Coordination and Collaboration Challenges, PALCI

Sustaining the Hyku Repository Platform:

Addressing Hyku's Unique Community Coordination and Collaboration Challenges

Overview - The Partnership for Academic Library Collaboration and Innovation (PALCI), in collaboration with the Private Academic Library Network of Indiana (PALNI), representing over 100 diverse academic libraries, is seeking an IMLS National Leadership Grant for Libraries totaling $248,600. This grant aims to support a 24-month project that enhances coordinated efforts among various Hyku projects, user communities, and developers. The goal is to ensure the sustainability and efficient development of the Samvera-based Hyku repository software, benefiting all users. This project will further collaborative decision-making for developing and integrating highly requested features into Hyku's core codebase, thereby improving the software's functionality for all users. By doing so, Hyku will become a more sustainable and effective repository solution, particularly for libraries dealing with budget constraints amid a consolidating commercial market. This initiative aligns with NGL-L Goal 3 and Objective 3.1, which aim to enhance digital infrastructure in libraries.

Project Justification

Program Goal. The project will address NGL-L Goal 3 and Objective 3.1 by collaborating to enhance digital repository infrastructure in libraries.

The Challenge. Consortia and libraries face a common challenge: the need for an affordable, easy-to-use, multi-tenant digital repository solution. The Hyku for Consortia Project emerged in response to this need, launching its self-funded production repository service in July 2023, following the successful completion of two previous IMLS-funded efforts. With active implementations ranging across four library consortia (PALCI, PALNI, VIVA, and the Boston Library Consortium (BLC)) encompassing over thirty libraries and growing, the scope of service continues to expand to serve the needs of these diverse institutions. Library organizations using Hyku through the PALCI and PALNI service range in size and scope of institutional mission, many with less than 5,000 total FTE and nearly all representing organizations that do not maintain in-house software development expertise. See Supporting Document 1 for a complete list of current implementations, PALCI/PALNI schools, and partnering consortia.

The PALCI and PALNI (PALs) project team shares its expertise across participating consortia and also networks with an active community of other Hyku implementers external to our project in the Hyku Interest Group, which includes Adventist Digital Library, Amigos, Atla, the British Library, Georgetown University, MOBIUS, the National Transportation Library, the University of Louisville, and the University of Tennessee, Knoxville. Previous user-driven enhancements to the platform, funded through IMLS Hyku for Consortia grants and other projects, have made the software an appealing option to provide repository services at scale.

This broad and diverse user base is a strength but also presents a fundamental challenge: connecting and intentionally coordinating the work of multiple user communities and developers across projects to ensure a sustainable, robust digital environment and efficient development of this vital digital infrastructure.

Hyku started small but has gained an active and growing group of organizational adopters. To date, Hyku's software development has occurred mainly in siloes, or on a project-by-project basis; however, increasingly, Hyku users have identified several universally acknowledged gaps in the product, requiring extensive negotiation among divergent visions and preferences. Today's Hyku requirements-gathering process must change substantially from highly individualized software maintenance and product development processes to accommodate a deeper level of collaboration. Community-level coordination and collaboration changes will represent a foundational shift in Hyku's community structure and serve as a linchpin for future decision-making. These efforts are intricately tied to and aligned with Samvera's community organization, emphasizing collaboration in areas most vital for the diverse organizations that use Hyku. As such, a structured decision-making process and framework have become increasingly critical.

Support of this project will enable PIs to test, evaluate, and improve community collaboration opportunities and provide evidence to allow individual institutions and multiple consortia to co-fund and sustain the services together going forward. This project will promote equity among libraries, ensuring that small libraries with underserved populations can access the same services as large research institutions. Importantly, this effort will increase Hyku's financial and organizational sustainability by broadening development expertise and scaling collaboration to support shared needs.

Scoping the Project. The Hyku community of users will evaluate and collaboratively frame community organizational structures, processes, and decision-making in alignment with its parent Samvera community since Hyku's current community practices lack the scale required to serve best and sustain Hyku's unique challenges and growing user base. To sustain Hyku, three significant needs have emerged:

1) Fiscal and Organizational Sustainability Focus

Many diverse institutions, including small and traditionally less well-resourced institutions, rely on Samvera Hyku as an alternative to costly and rigid commercial repository options. Focusing on fiscal and organizational sustainability is mission-critical work needed to ensure that Hyku remains a viable option and can grow with the community, with ongoing, easily integrated developments and updates. Without sustainability interventions, the future of Hyku is uncertain. Current users might resort to dissolving plans for repository services since they would likely be unable to cope with the costs of commercial platforms or the lack of resources required to stand up other open source repository options.

2) Efficiency and Organization in Collaboration

Although Hyku users frequently meet at conferences and interest groups, and informally at monthly "watercooler" sessions to share progress and ideas, there is a need for increased efficiency and coordination, and active collaboration, in core Hyku roadmap development. There are feature gaps and enhancements that are desirable across various Hyku projects and user communities. There is a need to establish processes to further collaborate on development priorities as a community rather than tackling gaps in a piecemeal, project-by-project approach. Siloed development, which may be faster in the short term, creates long-term frustration and duplication of effort for Hyku adopters who want to implement similar features immediately.

Development has primarily proceeded on a project-by-project basis, with projects selected by Hyku users and developed almost exclusively through a single service provider. This approach has enabled a degree of deduplication of effort, as the vendor works to inform Hyku users of what other users were planning to pursue or actively developing. Still, it has also led to a high degree of bottlenecking in development and inefficiency in logical development priority. This has also created occasional missteps due to miscommunication and tunnel-visioning on a specific development route that was pursued first, despite not reflecting the broad preferences of the Hyku community. Similarly, while most project-specific development is eventually added back to the Hyku code base, the process is time-consuming, and there is an opportunity to develop efficiencies in how work around commonly desired components is planned and implemented.

3) Increased Community Capacity & Diversified Developer Expertise

Capacity is desired in the area of community coordination. A person responsible for tracking shared needs, specifications, and overall progress is needed. Personnel from Software Services by Scientist.com have thus far provided valued facilitation to the Hyku Interest Group, and also track overall development in Hyku. This project seeks to provide additive capacity to facilitate increased attention to collaboration. The project PIs plan to redefine current practices and role provision to add bandwidth across the project for increased cooperation and transparent cross-project development.

Additional developer expertise and diversity are also needed in the Samvera environment to provide development at the scale required to support the growing Hyku user base. Compared to other open source repository communities, institutions using Hyku have few developers to contribute to the growth and maintenance of the software. SoftServ is the primary service provider for hosting Hyku, development of its features, and resolution of bugs. With much appreciation to SoftServ for their massive contribution to date, we would like to increase developer capacity to diversify expertise and mitigate the risks of overreliance on any one individual or organization, and potential effects of developer burnout. The project PIs plan to identify ways to co-fund, recruit, train, and retain institutional-directed developers to add sustainability, diversity, and a greater sense of agency to the Hyku community.

Building on Existing Practice. The proposed project builds on current practices in the Samvera community. For example, Samvera's Hyrax roles are defined at .25 FTE each (see Hyrax Product Owner and Hyrax Technical Lead). Samvera's Avalon Media System hosts a user roundtable to allow the community of users, testers, and adopters to share resources, ideas, and efforts toward the support, development, and future of Avalon Media System. The Roadmaps Alignment Group meets regularly and works to identify conflicts and areas of alignment across Samvera platforms. Samvera Partners and the Samvera Board offer a firm foundation for governance. Samvera's Community Manager, Heather Greer Klein, works closely with groups and offers guidance and holistic attention to the Samvera ecosystem. See Supporting Document 2 for more information about the Samvera Organization.

Our work seeks to better establish Hyku within that overarching Samvera structure by defining roles similar to those of Hyrax. Since Hyku evolved out of Hyrax (another open source repository software aimed at singular institutions, which requires a high degree of customization), it is lagging behind its parent technology in solidifying its working roles and base of experts for development and coordination. However, institutions using Hyrax also have more development and leadership staffing as they typically come from larger R1 institutions. Many open source communities have institutions that provide in-house developer expertise, but the Hyku community differs (see Organizational Profile and Supporting Document 1).

Structuring roles for Hyku will require additional work to determine how to build community capacity and ownership. For example, during this project, we will investigate how to scale the use of a community developer across a network. The work proposed here is a logical and timely expansion of Hyku structures to improve, optimize, and scale its efforts. Currently, the Hyku product owner and tech lead roles are intertwined and have yet to be officially defined. An individual Hyku expert at SoftServ is carrying out both roles. Though SoftServ has proven to be an invaluable development partner, this dual role unnecessarily strains development capacity and skews expertise and responsibility toward the service provider perspective over that of practitioners. This project offers an opportunity to evaluate the current status of Hyku activities and move towards an envisioned future state that is more sustainable (see table below).

To expand on existing practices in the Samvera Community, our project will involve researching what has been successful within Samvera and other open source software communities that work together and similarly defining areas for growth. We are especially mindful of burnout in open source communities, which is common.

Hyku Activities - Where we are and where we're going		
Hyku Activities	**Now - Current Status**	**Envisioned Future State**
Product Owner Role shepherding roadmap	Combined technical implementation and roadmap-focused role; time/expertise provided by Rob Kaufman, SoftServ	Defined independent roadmap role focused on product overall, and accountable directly to community
Software development requirements and implementation decisions in core Hyku code	Lacks articulation and is intertwined with the Product Owner role, provided by Rob Kaufman, SoftServ who supports Hyku	Articulated as a new Technical Lead Role, wholly separate from Product Owner role

Hyku Activities - Where we are and where we're going		
Software development	Primarily provided by SoftServ for institutions lacking in-house development resources and expertise	Increased diversity of developers, including community-funded, -managed, and -accountable development structures

Project Work Plan

Staffing. Building on what we have learned collaborating across the PALCI and PALNI consortia, with our institutions, and in the Samvera space, the grant work will be carried out by PALNI and PALCI project staff in the roles of Project Director, PALCI Support (Community Liaison), PALNI Support (Support & Development Liaison and Strategic Communications), and in collaboration with Project Co-Owners/Co-Principal Investigators Jill Morris and Kirsten Leonard, as well as partnering consultants/contractors, Hyku users, and Samvera Community Manager Heather Greer Klein.

Activities. The project will encompass five overlapping activity streams:

Activity Streams Overview					
Stream	**Activities**	**Outputs**	**Responsible**	**Accountable to**	**Who needs to be consulted?**
1: Finance	- Perform Economic Analysis and Assessment - Plan for Financial Sustainability	1. Hyku Economic Assessment 2. Financial Sustainability Plan	Consultant with PIs	PIs, Hyku projects, partners, and Samvera Community	Service providers, Hyku projects and partners, and Samvera Community
2: Collaboration	- Articulate Collaborative Development Infrastructure Needs - Define Community-Supported Hyku Product Owner and Tech Lead Roles	3. Hyku Community Development Workflow 4. Hyku Product Owner, Hyku Tech Lead Role Descriptions	Consultant with PIs	PIs, Hyku projects, partners, and Samvera Community	Hyku projects and partners and Samvera Community
3: Capacity	- Recruit, Train, and Retain a Hyku Community-Supported Developer - Recruit and Contract Services with a Hyku Product Owner	5. Hyku Community Developer Role Description	PIs and identified Product Owner, Community Developer	PIs, Hyku projects, partners, and Samvera Community	Service providers, Hyku projects and partners, and Samvera Community

Activity Streams Overview					
4: Pilot	- Demonstrate Proof of Concept with Community-Focused Software Development - Collaborate to Create Software Development Toolkit to Support Hyku Version Upgrades & Migrations	6: Community-Defined Hyku Feature Development 7. Software Development Toolkit to Support Hyku Version Upgrades & Migrations	PIs, Product Owner, Community Developer, SoftServ	PIs, Hyku projects, partners, and Samvera Community	Service providers, Hyku projects and partners
5: Evaluation	- Assess Effectiveness - Report and Articulate Self-Sustaining Practices	8. Hyku Community Self-Sustaining Practice Iteration Plan 9. Hyku Community Progress Reports with Self-Sustaining Practice Articulations	Project PIs	PIs, community partners, Samvera governance	Hyku projects and partners and Samvera Community

1. Finance: Perform Economic Analysis and Assessment and Plan for Financial Sustainability

In year one of the project, we will focus on the first three task streams. First, we will contract services with an economic specialist consultant (estimated consulting at approximately $7,500) to thoroughly analyze Hyku's total cost of ownership, including its financial resourcing requirements and impact. Through calendar year 2024, the project team and partners will work with the specialist to analyze the resources (fiscal, human, and technical) already invested and those needed to sustain Hyku long-term. This analysis will define the total cost to develop and maintain Hyku, including funding and in-kind contributions towards development and community facilitation. Using this analysis, the project team will produce **Output 1: Hyku Economic Assessment** early in 2025.

After identifying all cost centers and defining the resources involved, we will develop and employ a community funding pledge structure to ensure product sustainability by pooling funds across Hyku projects for identified maintenance needs, software development, and community facilitation. Development and staffing funding from IMLS will act as a kickstarter to fund near-term activities, and we will build upon this foundation to ensure financial sustainability beyond the grant. This work will produce **Output 2: Hyku Financial Sustainability Plan.**

The pledge structure, an expansion of the community drive that recently raised $53,000 in necessary funds for vital infrastructure improvements to Hyrax and Hyku (See: Samvera Community Celebrates Unprecedented Open Source Collaboration and Support), will define how Hyku collaborators can and should contribute funds and in-kind contributions for the long term. As part of the financial sustainability plan, we'll also create a system to recognize contributions and clearly tie funding and volunteer hours to communal benefits.

In the spring of 2025, we will release the Hyku Economic Assessment and Hyku Financial Sustainability Plan through a blog post on the Hyku for Consortia website. Feedback will be sought from Hyku projects/partners, the Hyku Commons user base, the Samvera Community, and the repository community at large. The project team will make revisions to these outputs based on feedback received.

2. Collaboration: Articulate Collaborative Development Infrastructure Needs and Define Community-Supported Hyku Product Owner and Tech Lead Roles

Simultaneous with the economic assessment and financial sustainability plan, we will focus on developing the organizational infrastructure and strategy to streamline cross-project Hyku development. We will start by completing research on previous practices in the Samvera Community and other community-driven open source projects. The project team will remain open to new models for collaboration but will draw from established practice as a starting place. During this research, we'll examine It Takes a Village: Open Source Software Sustainability A Guidebook for Programs Serving Cultural and Scientific Heritage and Community Cultivation: A Field Guide and select established community-building activities to increase Hyku's opportunities for success in open source collaboration and sustainability.

In the fall of 2024, we will hold three virtual monthly meetings with the Samvera Community Manager and partners from the Hyku Interest Group. We'll examine existing models for collaboration and, using activities outlined in the guides mentioned above, ideate around our group's ethos and goals and start defining the practices for the Product Owner and Tech Lead roles to support and articulate how Hyku users want to work together.

We will contract services with an organizational consultant (estimated at $20,000) to help our group coalesce around our foundational attributes and processes. Over three months, the consultant will provide vital facilitation, likely to include an in-person planning meeting, to articulate a process for cross-project development efforts and fully define the critical roles of Hyku Product Owner and Hyku Tech Lead.

Building on current practices for collaboration, maintenance, and growth in the Samvera Community, we will create **Output 3: Hyku Community Development Workflow** for the following tasks:

1. Identify shared needs and priorities
2. Build and maintain a readable feature roadmap
3. Map out specifications
4. Fund development (drawing upon decisions in Activity Stream 1)
5. Complete development
6. Assure quality of development
7. Deploy to Hyku core

As part of our organizational development, we will also clearly define the parameters of the key roles with **Output 4: Hyku Product Owner and Tech Lead Descriptions**. Working as a community, we will define and document, using the RACI matrix and other tools, the following and more:

1. What are the duties of the Hyku Product Owner and Tech Lead roles?
2. How do the Hyku Product Owner and Tech Leads make decisions?
3. Where do the Hyku Product Owner and Tech Leads roles fit within current Samvera/Hyku roles and practices?
4. How will the Hyku Product Owner and Tech Leads be recruited?

In the spring of 2025, we will release the Hyku Community Development Workflow and Hyku Product Owner and Tech Lead Descriptions through a blog post on the Hyku for Consortia website. As with earlier outputs, we will collect community feedback and revise as needed.

3. Capacity: Recruit, Train, and Retain a Hyku Community-Supported Developer and Recruit and Contract Services with Hyku Product Owner

In year one, as Finance and Capacity streams are underway, PIs will recruit a Hyku Community Developer-in-training who will be accountable directly to project PIs and the user community. We will identify and procure Hyku and Ruby on Rails-related training opportunities (estimated expense anticipated at $10,000) and invest in building the necessary skill set to add to the Hyku developer pool and strengthen the community's ability to contribute to Hyku on a technical level, independently from our already established software service provider firm. The applicant will be expected to have intermediate coding skills, but lack specific knowledge for working in Hyku. The time budgeted for training is nine months.

At the beginning of this activity stream, we will work with the Hyku Interest Group and service providers to identify tasks for a Community Developer, including, but not limited to:

1) Testing and quality control
2) Code maintenance
3) Updating documentation
4) Participating in Samvera developer congresses and hours pledges

This work will produce **Output 5: Hyku Community Developer Description**. In the fall of 2024, we will release the Hyku Community Developer Description through a blog post on the Hyku for Consortia website. Feedback will be sought from Hyku projects/partners, the Hyku Commons user base, the Samvera Community, and the repository community at large. Based on feedback, we will revise the description as needed.

The Hyku Community Developer differs from the Product Owner and Tech Lead roles in that it is a non-traditional role for the Samvera Community. Rather than in-house technical expertise at the institution level, this model explores how a community of institutions can band together to afford a shared developer, to add both overall capacity and agency among users. It may evolve throughout the project depending on the outcomes of the exploration.

After training is halfway complete, the project will contract with the trainee to implement their ongoing learning as the shared Hyku Community Developer, co-resourced by the grant and project partners. We will contract services at .25 FTE for approximately 18-20 months (initial estimate $39,000 for ~25% FTE), starting with grant funds for the first year and moving into a community pledge drive to support the role for the second year and beyond.

4. Pilot: Demonstrate Proof of Concept with Community-Focused Software Development and Collaborate to Create a Software Development Toolkit to Support Hyku Software Version Upgrades & Migrations

Work completed in activity streams one through three will be tested in this project phase, starting in the summer of 2025. To demonstrate the Financial Sustainability Plan's proof of concept, we will run a pledge drive to fund Hyku's newly developed shared organizational structures as defined in the first activity stream. This funding will build up the grant's kickstarter funds and co-fund costs in an on-going manner, such as shared staffing and maintenance.

Also, at that time, inter-project staffing of the Hyku Product Owner and Hyku Community Developer will be in place, and planned activities will provide a proof of concept for the new roles, coordination strategies, and funding structure. We will employ the infrastructure described in workstreams one through three to support functions within the Samvera governance to effectively carry out community-focused feature development for Hyku. The Hyku Interest Group will employ the Hyku Community Development Workflow to address a shared development need. Possible features for development could include improving accessibility, analytics, search engine optimization, metadata configurability, or user profiles, depending on community prioritization. We will seek to prioritize opportunities that no single project can invest in alone, where the effort benefits from needs identified in previous gap analyses and user studies.

Over several months in the second half of 2025, the Hyku Product Owner will work with the Hyku Interest Group, Samvera Community Manager, and project staff to identify a high-priority shared need, and define specifications. We will launch a pledge drive as described in the Hyku Community Development Workflow to fund the special development across projects further. We will then work with developers at SoftServ to complete development, assure quality and partner satisfaction, and deploy to Hyku core. This work will produce **Output 6: Community-Defined Hyku Feature Development.** At the end of 2025, we will report on the Community-Defined Hyku Feature Development through a blog post on the Hyku for Consortia website and collect feedback.

To further encourage project sustainability, ensure community uptake of new features, and test the Hyku Community Development Workflow, we will develop a robust upgrade and migration pathway for Hyku projects. The complexity of moving installations from server to server and from version to version presents a real barrier for organizations to gain the most recent functionality and keep their version of Hyku up-to-date. The Product Owner, Tech Lead, and Community Developer, in concert with the Hyku Interest Group, will collaborate to create a toolkit to support server migrations and community use of the latest Hyku version. The project team will create supplemental documentation and a user-friendly design for the toolkit. This work will produce **Output 7: Software Development Toolkit to Support Hyku Version Upgrades & Migrations.**

In the summer of 2026, we will report on the Software Development Toolkit to Support Hyku Version Upgrades & Migrations through a blog post on the Hyku for Consortia website, and collect feedback. We will encourage Hyku projects/partners to test the toolkit and provide suggestions for future iterations.

5. Evaluation: Assess Effectiveness and Report & Articulate Self Sustaining Practices

Starting in January 2025, we will evaluate and report on our progress and self-sustaining practices during this final activity stream. The Hyku Interest Group and Samvera Community Manager will convene virtually in January 2025 to define how to handle areas needing adjustment and iteration to achieve and maintain our shared goals of community self-sufficiency. Using strategies defined by the community and organizational consultant in activity stream two, we will create a method to define and document any areas for improvement and how we plan to address them. This work will produce **Output 8: Hyku Community Self-Sustaining Practice Iteration Plan.** In the spring of 2025, we will release the Hyku Community Self-Sustaining Practice Iteration Plan through a blog post on the Hyku for Consortia website for feedback, and make revisions as needed.

In the fall of 2025, we will reconvene virtually and in person at the Samvera Connect Conference (where we will also present mid-grant results) to assess the completed work results from activity streams one through three, using the iteration plan. This area of work will also involve being accountable to the Samvera Community, and solidifying buy-in from affected parties. In the summers of 2025 and 2026, the project team will produce for the Samvera Board, Samvera Partners, and the Samvera Community at large four progress reports articulating the self-sustaining practices we have created and seeking additional feedback. This work will produce **Output 9: Hyku Community Progress Reports with Self-Sustaining Practice Articulations**

We will be in close contact with our target user group during all activity streams. We hold bi-weekly office hours and quarterly user group meetings, where we will provide project updates and seek feedback from users. Using the Basecamp platform, we will share project news and solicit additional feedback.

In addition to reporting throughout the project, we will present findings at Samvera Connect and other conferences, potentially at the Charleston Conference, Coalition for Networked Information Member Meeting, Digital Initiatives Symposium, Library Publishing Forum, NASIG, Open Repositories, and the Digital Library Federation Forum. We will also submit our findings and report on our outputs in a related scholarly journal, potentially the Journal of Scholarly Communication and Librarianship.

Project Results

Addressing the Challenge. The project will result in increased sustainability and improved organizational structure for the Samvera Hyku open source repository software. Namely, as a result of our work plan, we will produce and share openly nine key outputs:

1) Hyku Economic Assessment
2) Hyku Financial Sustainability Plan, including:
    a) Pledge structure for fundraising
    b) System for recognizing contributions
3) Hyku Community Development Workflow
4) Hyku Product Owner and Hyku Tech Lead Role Descriptions
5) Hyku Community Developer Role Description
6) Community-Defined Feature Development
7) Software Development Toolkit to Support Hyku Software Version Upgrades & Migrations
8) Hyku Community Self-Sustaining Practice Iteration Plan
9) Four Hyku Community Progress Reports with Self-Sustaining Practice Articulations

Stream	Key Activities	Project Outputs
1: Finance	- Perform Economic Analysis and Assessment - Plan for Financial Sustainability	1. Hyku Economic Assessment 2. Financial Sustainability Plan
2: Collaboration	- Articulate Collaborative Development Infrastructure Needs - Define Community-Supported Hyku Product Owner and Tech Lead Roles	3. Hyku Community Development Workflow 4. Hyku Product Owner, Hyku Tech Lead Role Descriptions
3: Capacity	- Recruit, Train, and Retain a Hyku Community-Supported Developer - Recruit and Contract Services with a Hyku Product Owner	5. Hyku Community Developer Role Description
4: Pilot	- Demonstrate Proof of Concept with Community-Focused Software Development - Collaborate to Create Software Development Toolkit to Support Hyku Version Upgrades & Migrations	6: Community-Defined Hyku Feature Development 7. Software Development Toolkit to Support Hyku Version Upgrades & Migrations
5: Evaluation	- Assess Effectiveness - Report and Articulate Self-Sustaining Practices	8. Hyku Community Self-Sustaining Practice Iteration Plan 9. Hyku Community Progress Reports with Self-Sustaining Practice Articulations

These results will address the challenges we've identified by building upon solidifying the organizational

foundations upon which Hyku is built, ensuring future longevity for the software, and maintaining the investment in Hyku that community members have cultivated over the last several years. The project will directly benefit current Hyku users by ensuring that the software can continue to be offered at a reasonable cost point, and that enhancement requests can be fulfilled in an efficient manner.

National Impact and Adaptability. The project will decrease inefficiencies and siloed development and increase community ownership and agency in Hyku's future direction. In doing so, the project advances the existing Hyku community's understanding of how to work together more effectively. It strengthens the library community's ability to meet their needs for an affordable repository solution. To highlight the benefits affecting all libraries, the project team will promote the work to the library community via conferences and publications mentioned in activity stream five. This promotion should drive participation by making institutions increasingly aware of Hyku as a sustainable, viable open source alternative to commercial repository platforms. Increased participation will, in turn, make the platform even more sustainable as the community of users and expertise grows into the future.

The project will also contribute to developing and integrating highly desired features into base Hyku to improve the software for all. These deliverables will be accessible to other institutions and communities through the open source code repository. In addition, developers will be trained in Hyku, adding to the pool of expertise the community can draw upon for development needs. As a result, Hyku will become increasingly sustainable and effective as a repository solution for libraries facing budgetary challenges and a consolidating commercial market.

We will model and document the outcomes of creating a sustainability plan and community development workflow to strengthen open source software repository platform use, support development needs, and platform sustainability. This process will interest other open source community projects with similar concerns, such as Project ReShare and the Collaborative Collections Lifecycle Project, and we will share our experience to support other communities facing similar crossroads. In addition to the conference presentations and journal article mentioned above, we will document our outputs on the project webpage and share them widely with relevant stakeholders. We will add our processes to our existing toolkit for repository collaboration as an example of how to engage in this type of work. Also, the project team will offer to share our project as a case study with the creators (e.g., Lyrasis, Educopia, SessionLabs) of our collaboration facilitation tools.

Sustaining the Benefits. The overarching theme of this project is **long-term sustainability**. With the work completed under this grant project, the Hyku community will be well-positioned to sustain the benefits of the activities carried out here. Hyku will have achieved the vital infrastructure needed to be an enduring open source repository platform. The work completed through this project will be documented as part of the larger Samvera ecosystem, which will help shepherd Hyku forward and sustain its working structures.

<u>**Conclusion**</u>

The proposed project addresses Hyku's unique community coordination and collaboration challenges, particularly the need for fiscal and organizational sustainability, efficiency in collaboration, and increased capacity across many projects serving many small, less-funded institutions. Through five activity streams: Finance, Collaboration, Capacity, Pilot, and Evaluation, and with community input and buy-in, the project's nine deliverables will provide a firm financial plan, define working practices, build experience in collaboration across organizations, and add human resources to sustain the Hyku platform. By enhancing our ability to work efficiently across the community, we will ensure the future of the Hyku software, meeting libraries' need for an affordable, easy-to-use, multi-tenant digital repository solution.

Schedule of Completion

Stream	Schedule of Completion	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
1 Finance	Contract services with economic specialist	█	█										
	Resource analysis and cost definition			█	█	█							
	Create Output 1: Hyku Economic Assessment						█						
	Develop pledge structure							█					
	Create system to recognize contributions							█					
	Create Output 2: Financial Sustainability Plan								█				
	Share Outputs 1 and 2 for feedback									█			
	Revise Outputs 1 and 2 based on feedback									█	█		
2 Collaboration	Research previous practices in open source collaboration	█											
	Hyku Interest Group Meeting: Ethos and Goals		█										
	Hyku Interest Group Meeting: Role of Product Owner			█									
	Hyku Interest Group Meeting: Role of Tech Lead				█								
	Contract services with organizational consultant			█									
	Facilitated work/meeting(s): Process for Cross-Project Development						█	█	█				
	Create Output 3: Community Development Workflow								█				
	Facilitated work/meeting(s): Community Role Definition						█	█					
	Create Output 4: Hyku Product Owner and Tech Lead Descriptions								█				
	Share Outputs 3 and 4 for feedback									█			
	Revise Outputs 3 and 4 based on feedback									█	█		
3 Capacity	Recruit and select Hyku Community Developer-in-training	█	█										
	Create Output 5: Hyku Community Developer description	█	█										
	Share Output 5 for feedback			█									
	Revise Output 5 based on feedback				█	█							
	Developer training		█	█	█	█	█	█	█	█	█		
	Contract services with Hyku Community Developer						█	█	█	█	█	█	█
	Recruit and contract services with Hyku Product Owner											█	█
4 Pilot	Pilot Financial Sustainability Plan, Shared Staffing, and Community Development Workflow											█	█
	Pledge drive for Hyku Operations											█	█
	Identify and Create Specifications for Hyku Feature Development											█	█
	Pledge drive for Hyku Feature Development												
	Development Sprint(s) for Hyku Feature Development												
	Report on Output 6: Community-Defined Hyku Feature Development												
	Development Sprint(s) for Hyku Upgrade and Migration Toolkit Technology												
	Create Documentation for Hyku Upgrade and Migration Toolkit												
	Report on Output 7: Hyku Upgrade and Migration Toolkit												
	Toolkit testing and feedback						█						
5 Evaluation	Hyku Interest Group Meeting: Iteration Plan						█						
	Create Output 8: Hyku Community Self-Sustaining Practice Iteration Plan							█					
	Share Output 8 for feedback								█				
	Revise Output 8 based on feedback									█			
	Output 9a: Progress/practice report to Samvera Community: Activity Stream 1										█		
	Output 9b: Progress/practice report to Samvera Community: Activity Stream 2											█	
	Output 9c: Progress/practice report to Samvera Community: Activity Stream 3												█
	Hyku Interest Group Meeting: Assess Activity Streams 1- 3												
	Samvera Connect: Conference presentation on Streams 1-3 and follow-up Hyku Interest Group meeting												
	Output 9d: Progress/practice report to Samvera Community: Activity Stream 4												
	Write an article and submit to JLSC												
	Conference Presentations (e.g., CNI, Digital Initiatives Symposium, Library Publishing Forum, NASIG, Open Repositories, DLF)												

Schedule of Completion

Sustaining the Hyku Repository Platform: Addressing Hyku's Unique Community Coordination and Collaboration Challenges

Stream	Schedule of Completion	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
1 Finance	Contract services with economic specialist												
	Resource analysis and cost definition												
	Create Output 1: Hyku Economic Assessment												
	Develop pledge structure												
	Create system to recognize contributions												
	Create Output 2: Financial Sustainability Plan												
	Share Outputs 1 and 2 for feedback												
	Revise Outputs 1 and 2 based on feedback												
2 Collaboration	Research previous practices in open source collaboration												
	Hyku Interest Group Meeting: Ethos and Goals												
	Hyku Interest Group Meeting: Role of Product Owner												
	Hyku Interest Group Meeting: Role of Tech Lead												
	Contract services with organizational consultant												
	Facilitated work/meeting(s): Process for Cross-Project Development												
	Create Output 3: Community Development Workflow												
	Facilitated work/meeting(s): Community Role Definition												
	Create Output 4: Hyku Product Owner and Tech Lead Descriptions												
	Share Outputs 3 and 4 for feedback												
	Revise Outputs 3 and 4 based on feedback												
3 Capacity	Recruit and select Hyku Community Developer-in-training												
	Create Output 5: Hyku Community Developer description												
	Share Output 5 for feedback												
	Revise Output 5 based on feedback												
	Developer training												
	Contract services with Hyku Community Developer	█	█	█	█	█	█	█	█	█	█	█	█
	Recruit and contract services with Hyku Product Owner	█	█	█	█	█	█	█	█	█	█	█	█
4 Pilot	Pilot Financial Sustainability Plan, Shared Staffing, and Community Development Workflow	█	█	█	█	█	█	█	█	█	█	█	█
	Pledge drive for Hyku Operations	█	█	█	█	█							
	Identify and Create Specifications for Hyku Feature Development												
	Pledge drive for Hyku Feature Development	█	█										
	Development Sprint(s) for Hyku Feature Development			█	█	█							
	Report on Output 6: Community-Defined Hyku Feature Development					█							
	Development Sprint(s) for Hyku Upgrade and Migration Toolkit Technology						█	█	█				
	Create Documentation for Hyku Upgrade and Migration Toolkit									█	█		
	Report on Output 7: Hyku Upgrade and Migration Toolkit											█	
	Toolkit testing and feedback												█
5 Evaluation	Hyku Interest Group Meeting: Iteration Plan												
	Create Output 8: Hyku Community Self-Sustaining Practice Iteration Plan												
	Share Output 8 for feedback												
	Revise Output 8 based on feedback												
	Output 9a: Progress/practice report to Samvera Community: Activity Stream 1												
	Output 9b: Progress/practice report to Samvera Community: Activity Stream 2												
	Output 9c: Progress/practice report to Samvera Community: Activity Stream 3												
	Hyku Interest Group Meeting: Assess Activity Streams 1- 3	█											
	Samvera Connect: Conference presentation on Streams 1-3 and follow-up Hyku Interest Group meeting			█									
	Output 9d: Progress/practice report to Samvera Community: Activity Stream 4										█		
	Write an article and submit to JLSC								█	█	█	█	█
	Conference Presentations (e.g, CNI, Digital Initiatives Symposium, Library Publishing Forum, NASIG, Open Repositories, DLF)								█	█	█	█	█

<u>Digital Products Plan</u>

Type

As outputs of this project, we be producing text-based digital products in the form of analyses and reports. Further, the digital products produced and sustained through this project consist of a wide variety of types, which can be broken into several broad categories. Hyku is an open-source digital repository publishing platform, which hosts both digitized and born digital materials, representing both scholarly output in the form of research publication, datasets, journal articles and preprints, posters and presentations, and digital humanities materials in the form of digitized newspapers, photographs, literary works, and archival papers and records. Hyku organized resource types according to worktype as follows:

Generic/Image/ETD [Electronic Theses and Dissertations] Resource Types	Open Education Resource Learning Resource Type
Article	Article
Audio	Audio
Book	Book
Capstone Project	Capstone Project
Conference Proceeding	Conference Proceeding
Dataset	Dataset
Dissertation	Dissertation
Image	Image
Journal	Journal
Map or Cartographic Material	Map or Cartographic Material
Masters Thesis	Masters Thesis
Part of Book	Part of Book
Poster	Poster
Presentation	Presentation
Project	Project
Research Paper	Research Paper
Software or Program Code	Software or Program Code
Video	Video
	Other

The individual Hyku repositories themselves and our contributions to the Hyku code base are also digital products that will be created, sustained, and maintained through this project. Hyku is an open-source software maintained publicly at https://github.com/samvera/hyku. Our code base is maintained publicy at https://github.com/scientist-softserv/palni-palci as a gem.

Availability

The digital products generated through this project will be made available to multiple communities, utilizing Hyku's versatile access levels: public, private, and institutional. Our primary focus is on publishing works at the public and institutional levels. We utilize Hyku's functionality to set

embargoes and leases, ensuring compliance with permissions and copyright requirements over time. We employ in-app analytics within Hyku to monitor the viewing and downloading activities of both individual works and collections, providing valuable insights into user engagement.

All code will be openly shared on github and project documentation will be openly shared on related webpages.

Access
Public access, which has been the predominant usage pattern in our collaborative repositories, remains the primary focus. This ensures broad accessibility to the internet community.

Open Educational Resources (OERs) are a key aspect of our platform, aligning with Hyku's open-source nature. Hyku facilitates open accessibility by requiring a controlled vocabulary selection of rights, sourced from rightsstatement.org, for all published works. Additionally, authors can assign Creative Commons licenses to their works. Flexibility is maintained regarding file accessibility, allowing for either downloadable files or web-browser-only viewing.

Enhancements and customizations to the Hyku code will be contributed back to the public git repository at https://github.com/samvera/hyku.

Sustainability
This project aims to bolster sustainability practices, particularly focusing on financial and organizational aspects to support the ongoing enhancement and widespread adoption of Hyku. Hyku itself already serves as a flexible and sustainable open-source solution, adaptable to various digital infrastructures, including both local network installations and cloud-based hosting on platforms such as Azure and AWS. It promotes the sustainability of published digital products through features like BagIt-based export functions with digital checksums, facilitating smooth migration paths in the future.

Our project's core objective is to ensure the longevity and upkeep of Hyku as a digital asset by strengthening its financial and organizational frameworks. Phase one of our plan entails conducting an economic analysis and formulating a strategy for financial sustainability. As an output of this, we will establish a community funding pledge structure, pooling resources across projects to address identified maintenance needs, software development, and community facilitation. Embracing this funding model will enable us to appoint dedicated individuals as a "product owner" and tech lead, representing the interests of the Hyku user community—a proven approach in successful open-source software development within the Samvera community. This structure will persist past the project period, ensuring the long-term viability of Hyku as an open-source option for schools, archives, and libraries.

Digital products created by PALNI and PALCI or its contractors during the operation of the project, such as the economic analysis, will be made available from the project website and disseminated on relevant websites. Files and products identified as requiring longer term storage and access will be published through PALNI's digital repository at https://palni.hykucommons.org.