Advancing Hyku: Open Source Institutional Repository Platform Development

Final Report, April 16, 2022

Funded by Arcadia—a charitable fund of philanthropists Lisbet Rausing and Peter Baldwin

Original Project Duration: October 2019–September 2021
Extended to April 2022

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Executive Summary

The Advancing Hyku project has completed design and implementation of specific advances to the open-source community repository product Hyku, part of the Samvera repository framework. These advances drive green open access and increase value to researchers with a combined approach of auto-population and expanding the array of integrated, open source services. Institutional repositories utilizing the Hyku codebase are now a more attractive dissemination option than previous versions of repository interfaces and infrastructures because of code developed and contributed by this project.

The primary institutional partners on the project were the University of Virginia Library and the British Library, both of whom are members of the Samvera community receiving services from Ubiquity Press, which performed most of the technical development in close coordination with these community partners.

Our work to scale Hyku repositories automatically by integrating open-resource discovery tools (e.g. Unpaywall), connecting to author identification and profile services (e.g. ORCID), and establishing pathways to long-term preservation services proceeded after some unavoidable delays caused by worldwide pandemic conditions. We drew upon Ubiquity's publishing experience to treat articles, books, and newer forms of scholarship in repositories as first-class objects, and focused on authors to incentivize their participation. British Library took the lead on Samvera Community coordination, and updated Hyku architecture recommendations based on recent experiences in local and community projects.

The partners worked together throughout the original and extended grant period to assess requirements and jointly create detailed, component-specific development plans, resulting in new capabilities collaboratively developed by Ubiquity Press and the two institutions. All code delivered by the project has already been or is about to be released as open source and merged with the Hyku core codebase in accord with the Samvera Community's practices.

Progress Toward Outcomes

As detailed in the original award proposal, progress toward stated outcomes can be measured through progress in any three out of four of the following.

1. All features developed, released as open source, and integrated with the Hyku core code base consistent with Samvera Community standards where appropriate.

The chart below contains work completed by Ubiquity Press and partners as of the date of this report, and has been approved by the Hyku/Samvera community for contribution back to the Hyku/Hyrax Core code base. (Appendix A)

This Adoption Path Chart for institutions to adopt the latest version (or specific features) of "Advanced Hyku" is pulled from the living Samvera Community document We Advanced Hyku, and You Can, Too at https://docs.google.com/document/d/1oB65bAWCoJtdiZqkeAOBFGpQXQTezMS7nm2UC8Nv3uc/edit?usp=sharing

Adoption Path Chart

Option 1. Install Hyku (version listed) or later
Option 2: Available in stand-alone gem (no need to install Hyku addons)
Option 3. Install Advancing Hyku-addons to your version of Hyku

Want it all at once? **Option 4** is to work with UP on a hosted version of Hyku (inclusive of Options 1 through 3).

Feature	**Status**	**Description**	**How to get it in your repository instance**
Cross tenant search (WP0) Demo: WP0 Shared Search Layer (Edward Iye, September 2021)	In Hyku v. 2 Dec 10, 2021	As a service provider/ repository manager, I would like to provide a meta-search in order to search across all tenant repositories within the consortium.	Option 1 Install Hyku v. 2 later Pull request is available on Samvera GitHub or Option 3 Install Hyku addons https://github.com/ubiquitypress/hyku_addons/pull/468
Auto-expiration of embargoes and	In Hyku v. 3 Apr 13, 2021	As a repository manager, I would like	Option 1 Install Hyku v. 3 or

leases (WP0)		the system to change the visibility of a work when embargoes and leases have expired to avoid looking for and manually applying embargo and lease expiration.	later
Rest API for all (WP0)	In Samvera Labs March 16, 2022	Displays data to any front end.	Option 2 Rest API from **Samvera Labs** https://github.com/samvera-labs/hyku-api
DOI minting in deposit form (DataCite integration) (WP0)	Gem available for installation in Hyku v. 2 and Hyrax 2.9 Sep 13, 2021	1.As a repository manager, I would like the ability to turn on (or off) the ability for my researchers to mint DOIs. 2.As a repository manager/ researcher, I would like to reserve a DOI for a work which is not public yet, in a draft status.	Option 2 install Hyrax DOI from **Samvera Labs** https://github.com/samvera-labs/hyrax-doi DOI tab removed: https://github.com/ubiquitypress/hyku_addons/pull/585
Auto-fill metadata fields with DOI in a single record (both DataCite and Crossref) WP0	Gem available for installation in Hyku v. 2 and Hyrax 2.9 Sep 13, 2021	As a repository manager/researcher, I would like to fill the metadata by supplying a DOI and the system automatically querying Crossref/DataCite and mapping the response to the given work type's attributes.	Option 2 install Hyrax DOI from **Samvera Labs** https://github.com/samvera-labs/hyrax-doi DOI tab removed: https://github.com/ubiquitypress/hyku_addons/pull/585
Auto-population of records with bulk DOIs through Unpaywall (WP1)	Available for installation in Hyku v. 2 and Hyrax 2.9 January, 2022	As a repository manager, I want to identify content published by authors at my institution, that is not already in the repository, to be able to validate the metadata, and to import this content.	Option 2 https://github.com/ubiquitypress/hyrax-autopopulation

Auto-population of records with bulk /list of ORCID IDs (WP1)	In Hyku v. 2 and Hyrax 2.9 January, 2022	As a repository manager, I want to identify content published by authors at my institution that is not already in the repository, to be able to validate the authors, and to import this content.	Option 2 https://github.com/ubiquitypress/hyrax-autopopulation
Mint DOIs while importing through Bulkrax (WP0)	In Hyku v. 2 and Hyrax 2.9 January, 2022	As a repository administrator, I can bulk mint DOIs through the importer.	Option 3 Install Hyku addons https://github.com/ubiquitypress/hyku_addons/pull/605
RIS (Research Information Systems) citation related export	In Hyku v. 3 Sep 21, 2021	As a reader/ end user, I would like to export citations to reference management systems such as Zotero, Endnote, and Mendeley.	Option 3 Install Hyku addons https://github.com/ubiquitypress/hyku_addons/pull/30
Integration with ORCID, author identifier (WP3) Demo: WP3 ORCID Full Feature (Paul Danelli, September 2021)	In Samvera Labs March 16, 2022 Standalone gem Oct 26, 2021	1.As a researcher/author, all works I add to the repository are also displayed under my ORCID record. (from repo to ORCID) 2.As a researcher/author, I would like to see my list of deposited work in the repository under my author ID e.g. ORCID	Option 2 Available in standalone gem in Samvera Labs https://github.com/samvera-labs/hyrax-orcid
OAI-PMH (WP0)	In local instance (UP's Advanced Hyku) Dec 17, 2020	As a repository manager, I want my repository to be harvested by aggregators and other search platforms.	Option 3 Install Hyku addons https://github.com/ubiquitypress/hyku_addons/pull/21

Per-Tenant Google Analytics (WP2)		As a repository manager, I would like to gather statistics of the repository's web traffic via Google Analytics	Option 2 Install Hyrax HIRMEOS plug in https://github.com/ubiquitypress/hyrax-hirmeos
CSV Exports / imports -Bulkrax (WP0)	In local instance (UP's Advanced Hyku v.2) February 2021	As a repository manager, I would like to have CSV export and import to bulk load content, round-trip data for batch editing, and to migrate versions.	Option 3 Use Bulkrax with Hyku addon https://github.com/ubiquitypress/hyku_addons/pull/67
File Availability Faceting (WP0)	In local instance (UP's Advanced Hyku) Feb 17, 2021	1.As a reader/ end user, I would like to filter the search results available with full text files in the repository. 2.As a user, I would like to be able to access content regardless of whether a file copy is available.	Option 3 Install Hyku addons https://github.com/ubiquitypress/hyku_addons/pull/62
Custom work types and extended metadata attributes (WP8)	In progress Sep 21, 2021 (See UP pull request 512 on schema work as a transition step towards improving Allison flex)	1.As a repository manager, I have access to custom work types to meet institutional needs (e.g. musical scores, conference proceedings). 2.As a repository manager, I can follow documentation to create additional metadata attributes added to each work type to meet funder/institutional requirements	Option 3 Install Hyku addons https://github.com/ubiquitypress/hyku_addons/pull/512

In-browser PDF display and annotation through Hypothes.is (WP4)	In Hyku v. 2 and Hyrax 2.9 December, 2021	As a reader/end user, I would like to be able to view file content in the browser without downloading it. As a reader/end user, I would like to comment and annotate on the full-text file.	Option 3 Install Hyku addons https://github.com/ubiquitypress/hyku_addons/pull/565

2. A 10 percent increase in deposited content that can be attributed to new auto-deposit capabilities, between the project start and end dates, for Hyku repositories.

- Features were released too late in the project lifecycle to be able to measure the impact on existing repositories that Ubiquity manages, but it was one of the reasons for customers to join the platform. From the date the project started, the number of open items in Ubiquity repositories have significantly increased. See the Ubiquity Press Report in Appendices for details on Hyku uptake and OA content increases in installed Hyku instances supported by Ubiquity Press. (Appendix H)

3. A 10 percent increase in deposits of complete intellectual objects (as opposed to title/abstract only) in institutional Hyku repositories.

- The project has just completed and most existing Hyku repositories have not yet had time to assimilate the features contributed by it. As such it is not yet possible to meaningfully measure any increase in deposit to Hyku repositories. Ubiquity Press provides related feedback from Ubiquity repositories where the code has been adopted earlier. (Appendix H)

4. Post-migration analysis of Hyku at the British Library and pilot migration of content from the existing Samvera Sufia platform to a Hyku environment for the University of Virginia, demonstrating a higher degree of feasibility and ease for such migrations of institutional repositories in general.

- Summary of UVA migration: We migrated content from UVA's LibraOpen repository (based on Sufia 7.3) into the Hyku version developed by Advancing Hyku (the products of this grant). Results from the test demonstrated the steps needed to take existing content (metadata and files) from legacy repositories and ingest them in an "Advanced Hyku" repository. (Appendix J)
- Summary of BL migration: the Shared Research Repository migrated from Hyku version 1 to Hyku version 3, but also changed service providers partway through the migration process. Ilkay Holt and Rachael Kotarski provided this short summary report that because

of these factors, the BL migration case was too unique for a detailed analysis to be of much relevance to future adopters.

Broader Impacts

1. Increased uptake of Hyku software, particularly by a broader range of institutions (e.g. community colleges, memory institutions) and service providers.

- Current list of institutions running UP Hyku instances (UP repository clients):
  - Pacific University https://commons.pacificu.edu/
  - University of Redlands https://inspire.redlands.edu/
  - University of Colorado Anschutz Medical Campus https://digitalcollections.cuanschutz.edu/
  - Auraria Library https://digital.auraria.edu/
  - University of North Alabama https://ir.una.edu/
  - Northeastern State University https://digitallibrary.nsuok.edu/

2. For this work to lead to greater use of repositories for research outputs overall, by setting an example of best practice.

One best practice in community software development is the alignment of features across institutions, done with input and discussion in existing forums for inclusion. The Advancing Hyku team understood that to prevent unintentional branching of our project from alignment with the greater Samvera Community's goals, a significant review of alignment of the features proposed in the Advancing Hyku with the greater Hyku and Hyrax community's goals was essential.

In every element, the partners aimed for two-way engagement to make sure that the project reflected the needs of its target audience, and broadcast the work and successes of the project to all stakeholders to enable them to implement or even build on what the project achieved. Broadcasting happened via regular project updates on the website https://advancinghyku.io/, conference participation and social media use. Project partners shared news and project progress in relevant and targeted events both online and in person throughout original and extended project activity dates. As of March 2022, partners are waiting to hear whether proposals for community presentations have been accepted for Samvera Virtual Connect (May 2022) and Open Repositories (June 2022) which both occur after project closing dates.

To ensure ongoing community engagement beyond formal presentations, the project team maintained regular contact with the Samvera Hyku Community to exchange knowledge, share experience and updates through monthly meetings, Slack channels and mailing lists. Representatives from this project attended the community Hyku Interest Group meetings. Most significantly, project partner Ubiquity Press initiated monthly "Hyku Dev Call" meetings each month in July 2021. We are pleased to report that these calls will continue beyond the Advancing Hyku project because of robust participation and leadership from members of the Dev Call on continuing projects. The Hyku Community Roadmap initiated by British Library's Ilkay Holt will

also continue past the Advancing Hyku project thanks to broad community uptake of this shared planning mechanism. (Appendix D)

3. By setting an example of how repositories can encourage frictionless green open access, we hope to further reduce barriers to open access overall.

The project introduced significant new features to the Samvera Community's Hyku platform. The project team highly valued community engagement, and framed its activities around a thorough communication plan. (Appendix B)

Outcome Analysis

Work Delivered

We Advanced Hyku, and You Can, Too

- See this living Samvera Community document at https://docs.google.com/document/d/1oB65bAWCoJtdiZqkeAOBFGpQXQTezMS7nm2UC8Nv3uc/edit?usp=sharing (Appendix A)

Assessment Work

- Project management planning was completed in January 2020 by UVA PI Ellen Ramsey with contributions from all team members.
- Ubiquity Press completed its user interface/usability assessment in May 2020 (led by Elisa Barrett and Brian Hole).
- UVA tested migrating the existing contents of its LibraOpen (Sufia) open content repository to the Advanced Hyku platform in February 2022 (Appendix J).
- Ubiquity Press completed the assessment review Advancing Hyku: Alignment of UP's Hyku codebase with Hyku 2 /3
- British Library completed the Architecture Review for Advancing Hyku in June 2020 and updated comments on architecture and iterative approaches in March 2022 (Appendix C).

Work Packages

were detailed and scheduled for each sprint of related feature development:

WP0 – Hyku 2/3 alignment
Implementation of recommendations in the document Advancing Hyku: Alignment of UP's Hyku codebase with Hyku 2 / 3 (Appendix H)

WP1 – Auto-population of repository with OA content
DOI, Unpaywall/OAButton (Appendix H)

WP2 – Metrics Phase 1
Repository metrics modeled on metrics of online journals (Appendix H)

WP3 – Sync items in repositories with author identification and profile services
ORCID (Appendix H)

WP4 – Enable reading, commenting and annotating
On full text from within repository record (Appendix H)

WP5 – Increase access and establish pathways to long-term preservation services
APTrust, others (Appendix D)

WP6 – Assessment of user interface, user experience platform architecture improvements To increase uptake of Hyku by institutions and individual authors (Appendix C)

WP7 – Metrics Phase 2
Add metrics according to user cases after advanced features have been implemented

WP8 – Migration Analysis
UVA's case study of migrating the existing contents of its LibraOpen open content repository to the Advanced Hyku platform (Appendix J)

Schedule Adjustment Narrative

Significant delays in beginning and delivering work were the result of two situations out of the control of the Advancing Hyku project leads and team:

1. Working with an international funding agency such as Arcadia is less common at the University of Virginia and required additional approvals of grant finance requirements acceptable in both US and UK jurisdictions. Similarly, negotiation of UVA's sub-award to international partner institution British Library required additional negotiation of terms acceptable at both government-sponsored institutions involved.

2. Covid disruptions delayed the ability of partners to hire qualified candidates for some months beyond initial projections. As of August 2020, all professional staff detailed in the original project proposal were productively engaged toward project outcomes. Beginning in Year Two there were several arrivals and departures of developers, consistent with upheaval in the employment market worldwide.

Project Staffing and Recruitment

Position/Incumbent	**Partner**	**Planned Start**	**Actual Start–End Dates**
PI/Ellen Ramsey	UVA	September 2019	October 2019–April 2022
Product Owner/Sherry Lake	UVA	September 2019	October 2019–

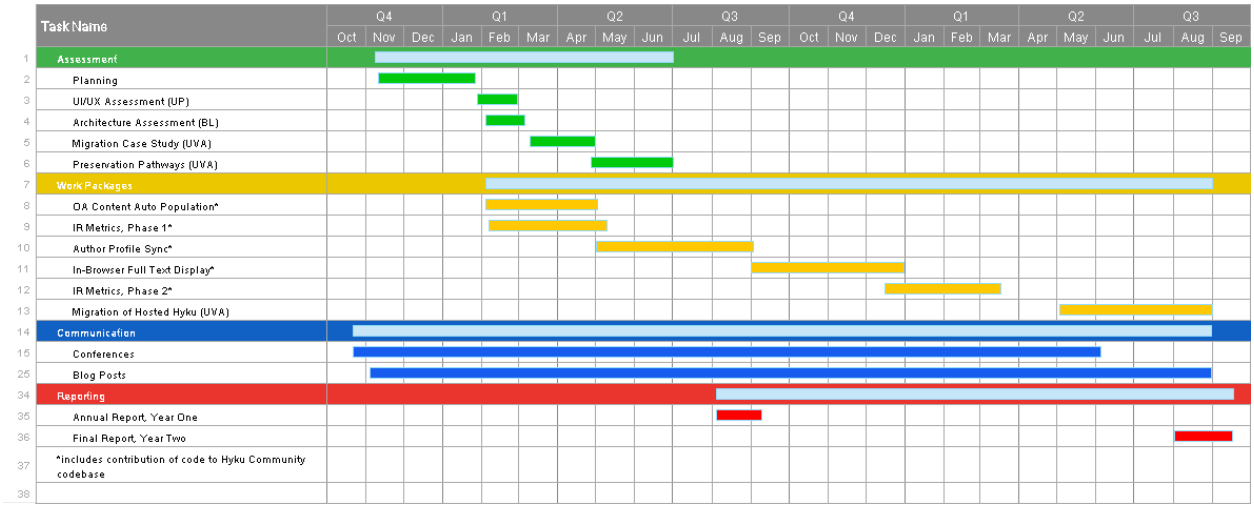
			February 2022
co-PI/Rachael Kotarski	BL	September 2019	October 2019–March 2022
Analyst/Rathin Sundar	BL	February 2020	March 2020
co-PI/Brian Hole	UP	September 2019	October 2019–March 2022
Project Manager/Elisa Barrett*	UP	September 2019	November 2019–March 2022
Sr Dev/Chris Colvard*	UP	January 2020	June 2020–July 2021
Jr Dev/Bertie Wooles*	UP	January 2020	January 2020–March 2022
UX Dev/Mattin Delavar*	UP	January 2020	August 2020–December 2021
Project Manager/Ilkay Holt*	BL	February 2020	July 2020–March 2022
Sr Dev/Eneko Taberna*	UP	replacement hire	October 2020–November 2021
Sr Dev/Paul Danelli*	UP	replacement hire	December 2020–March 2022
Sr Dev/Edward Iye*	UP	replacement hire	January 2020–October 2020; July 2021–February 2022
Sr Dev/Tom Giles*	UP	replacement hire	August 2021–February 2022

* Grant-funded new hires

Project Roadmap Images

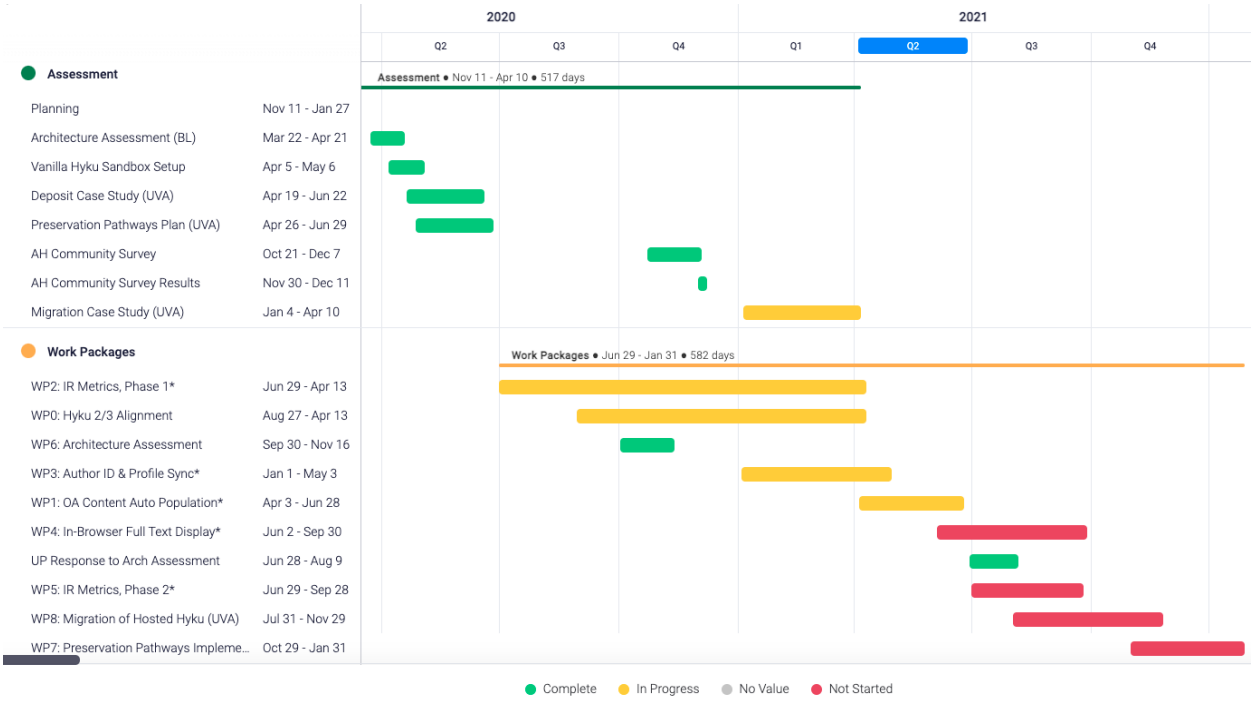
Original Roadmap Thumbnail

August 2019 (See Appendix E for higher resolution)



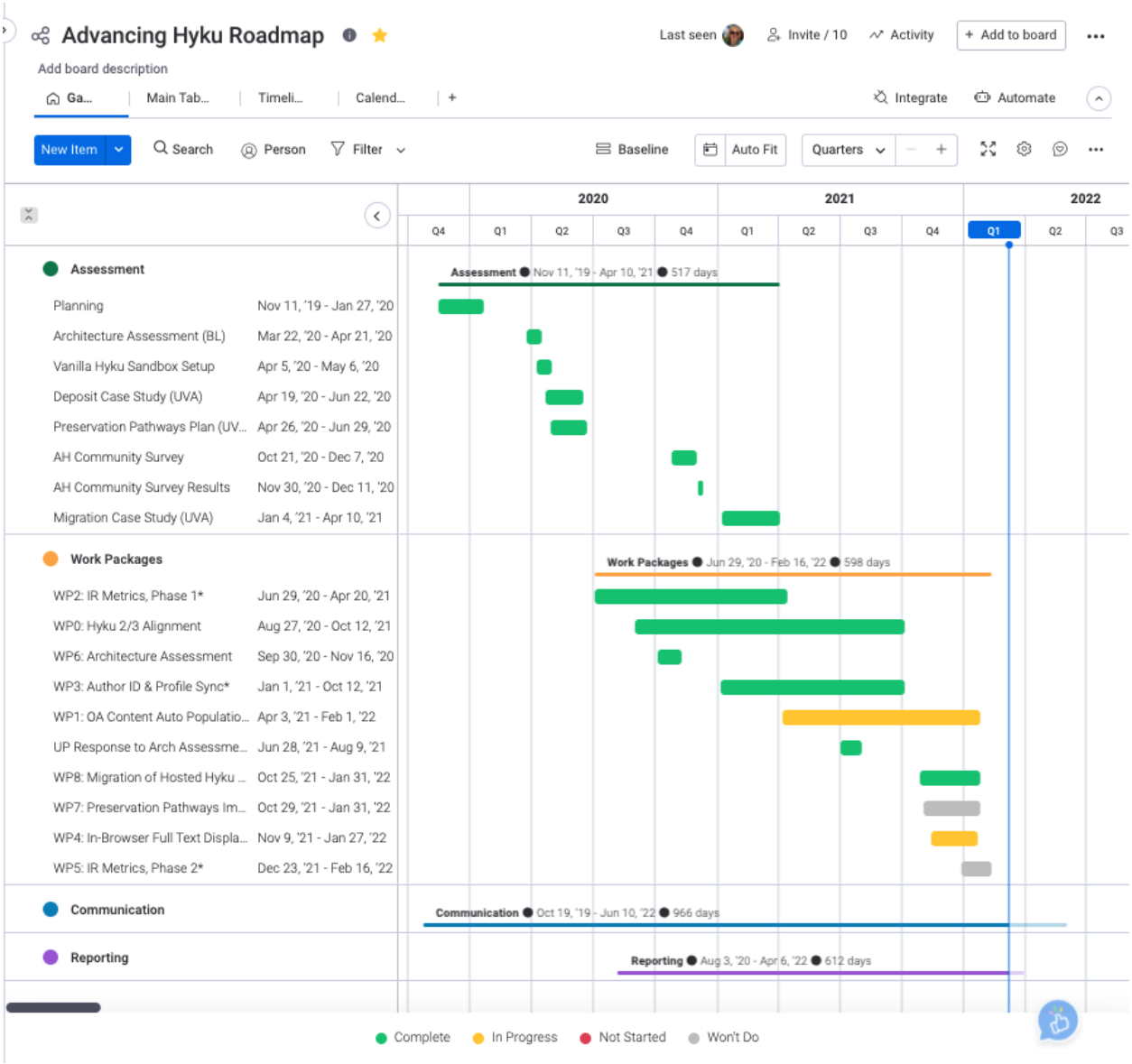
Year Two Roadmap Thumbnail

April 2021 (See Appendix F for higher resolution)



End of Project Roadmap Thumbnail

March 2022 (See Appendix G for higher resolution)



Alignment work with Samvera community

The Advancing Hyku project partners worked closely with the Samvera community throughout our project to identify related ongoing projects, developments in progress and plans for the future. Plans and groups are in place to enable continued collaboration with the Samvera community stakeholders to avoid duplicating efforts and continue work that mutually benefits the core code and future adopters.

The Samvera Community has roadmaps adopted separately by subcomponents of Hyrax, Hyku and Avalon. The Hyku Project has a roadmap (Appendix D) indicating planned features and the timeline, much of which was initially defined and populated from work done by the British Library's Advancing Hyku project manager Ilkay Holt. The Advancing Hyku project team communicated with other community roadmaps but particularly with the Samvera Hyku Interest Group to align the roadmaps, define the areas of joint interest, and collaborate to minimize duplication of effort and maximize elements which can be shared across the closely aligned Hyrax and Hyku products.

The project team regularly took part in communication channels, influencing the Hyku Roadmap in the interest of Advancing Hyku project partners where possible, aligning the Project Roadmap with the Hyku Roadmap, contributing to feature development, and getting community input on feature prioritization and functionality.

Within the Samvera Hyku Interest Group, the project team made particular effort to collaborate with Oregon Digital (a partnership of University of Oregon and Oregon State University) on their Hyrax Analytics project to align and join efforts in developing a suite of analytics and reporting tools for Hyrax/Hyku. Another close collaboration began during the project with Pennsylvania Academic Library Consortium, Inc. (PALCI) and Private Academic Library Network of Indiana (PALNI) regarding their Hyku for Consortia project. Partners worked closely during the several months of overlap between the two projects to align and join efforts in developing and feeding back code for the multi-tenant features of Hyku as implemented by British Library and PALNI/PALCI in their respective repositories.

The excellent initial work on preservation packaging techniques via APTrust's DART service in Advancing Hyku is now in the queue to be accomplished through an APTrust and Hyku for Consortia collaboration. This has been a good example of constructive communication between the Hyku community projects in terms of placing the uncompleted and still needed work in the most appropriate projects. See this information in context in our November 2021 blog post about community collaboration.

The partners worked together over the original and extended grant periods to assess requirements and jointly create detailed, component-specific development plans, resulting in new capabilities collaboratively developed by Ubiquity and the two institutions. All code developed was or will be released as open source and merged with the Hyku core codebase in accord with the Samvera Community's practices. (See Outcomes chart above).

Data, Materials and Papers Produced

Data, materials and papers produced are all available free on the internet via deposit in the existing UVA open repository LibraOpen.

Outputs

The outputs are linked on a specific page of the project's public-facing web site:

https://advancinghyku.io/outputs/. Statistics* about use of outputs by the public are available in the chart below.

Outputs through March 16, 2022	**Persistent Link**	**Format & Date**	***Views/ Downloads**
https://advancinghyku.io/ Archived Site	TBD on Samvera Wiki	Web Pages, Mar 2022	
ORCID Integration (Hyku YouTube Channel & Github)	https://github.com/samvera/hyku/issues/1688	Recorded Demo, Jan 2022	72
Auto-population workflows for Hyku (Hyku YouTube Channel)	https://youtu.be/gYxsygdsHTI	Recorded Demo, Dec 2021	59
Cross-Tenant/Shared Search Layer (Hyku YouTube Channel & Github)	https://github.com/samvera/hyku/issues/1675	Recorded Demo, Oct 2021	30
Demonstration of Author Profile Syncing with ORCID in Hyku (Samvera Connect, Recorded)	https://doi.org/10.18130/2ngh-dk29	Recorded Demo, Oct 2021	112
Hyku Projects Panel: In the Community and In the Wild (Samvera Connect)	https://doi.org/10.18130/3h0a-xt81	Presentation, Oct 2021	47/81
Advancing Hyku: Year Two Project Update (Open Repositories)	https://doi.org/10.18130/cm5g-2f64	Poster, Jun 2021	61/10
Advancing Hyku Year Two Update (Samvera Virtual Connect)	https://doi.org/10.18130/jgr4-th56	Presentation, Apr 2021	154/50
Driving Green Open Access (Munin Conference on Scholarly Publishing)	https://doi.org/10.7557/5.5609	Presentation, Nov 2020	NA
On the verge of success – or failure? Reflections on repositories and the wider library knowledge infrastructure (and a bit about Hyku) (Samvera Connect)	https://repo.samvera.org/concern/generic_works/712a1039-373d-43d8-86db-fd5f08173ec3	Keynote Presentation, Oct 2020	NA
Why Hyku? (Samvera Connect)	https://repo.samvera.org/concern/generic_works/5066c8b4-0269-42de-8312-532e19a00ced	Panel, Oct 2020	NA

Outputs through March 16, 2022	**Persistent Link**	**Format & Date**	***Views/ Downloads**
Your vote matters! Community Input Survey (Samvera Connect)	https://doi.org/10.18130/v3-86vb-1k46	Presentation, Oct 2020	145/79
DOIng more with Hyrax (Samvera Connect)	https://repo.samvera.org/concern/generic_works/3ce9e77f-b107-4fe8-befe-588de1cce83c	Lightning Talk, Oct 2020	NA
Samvera Connect 2020 Persistent Identifiers (Samvera Connect)	https://repo.samvera.org/concern/file_sets/c9b52ff0-9ddb-480d-b890-f52ee4164ce1	Poster, Oct 2020	NA
Ubiquity Repositories Architecture (Samvera Connect, Recorded)	https://repo.samvera.org/concern/generic_works/25eba708-9f07-40a2-ae76-48f369cc44be	Presentation, Oct 2020	NA
Advancing Hyku Annual Report for Year One	https://doi.org/10.18130/xgss-5m42	Report, Sep 2020	14/3
Advancing Hyku Project Communication Plan	https://doi.org/10.18130/v3-ajhh-ke12	Report, Aug 2020	78/25
DC-GLUG Advancing Hyku Presentation (Digital Commons + Great Lakes User Group)	https://doi.org/10.18130/v3-tye1-1309	Presentation, Jul 2020	97/56
Shared repositories: Building a multi-tenancy repository service at the British Library (Open Repositories)	https://doi.org/10.18130/v3-xt15-3w34	Poster, Jun 2020	119/154
Architecture Review for Advancing Hyku Project	https://doi.org/10.18130/v3-k4an-w022	Report, Jun 2020	324/156
Driving More Green Open Access: Advancing Hyku Project (Library Publishing Forum)	https://doi.org/10.18130/v3-d6jx-9z41	Poster, May 2020	338/214
A Hykurax Panel: Advancing Hyku; Hyku for Consortia; Hyrax Analytics (Samvera Connect Virtual)	https://doi.org/10.18130/v3-g2z3-yt37	Panel, May 2020	131/83

Outputs through March 16, 2022	**Persistent Link**	**Format & Date**	***Views/ Downloads**
Advancing Hyku: Samvera Partner Call Presentation (Recorded)	https://doi.org/10.18130/v3-mwqg-s426	Presentation, Nov 2019	333/199
Advancing Hyku: Open Source Institutional Repository Platform Development (Samvera Connect)	https://doi.org/10.18130/v3-wnpz-jg98	Poster, Oct 2019	216/198
Advancing Hyku: Open Source Institutional Repository Platform Development (Samvera Connect)	https://doi.org/10.18130/v3-kx6v-ax25	Lightning Talk, Oct 2019	323/280

*Statistics about use of outputs by the public are less than reliable or robust in this pre-Hyku repository, which is one of the reasons UVA opted to lead this project.

Financial Report

A financial report of budgeted grant expenditure against grant expenditure, including an explanation of any inconsistencies, was provided directly to the funder on April 15, 2022.

Budget Certification

Confirmation from the UVA financial controller of expenditures was provided as a separate document sent directly to the funder on April 15, 2022.

No-cost Extension Requests

Because of delays in starting work caused by factors detailed in the Progress Analysis section above, the Advancing Hyku team requested from Arcadia and was granted two separate no-cost extensions of the grant period to successfully complete project objectives. The first extension moved the project completion date to February 16, 2022, with the final grant report due date accordingly adjusted to April 16, 2022. The second extension moved the project completion date to April 16, 2022. No adjustment was needed to the final grant report due date.

Project Images

Included below are images relating to work carried out with grant funds within the time period covered by the report that Arcadia is authorized to use for publicity purposes. Files of the images with 300dpi are provided separately where possible.

Image 1: Monthly Project Update Meeting

October 12, 2021 monthly update meeting at British Library. Notable as the team's only in-person meeting during the entire project. Clockwise from left: Elisa Barrett (UP), Bertie Wooles (UP), Ilkay Holt (BL), Torsten Reimer (BL), Ellen Ramsey (UVA). Present but not pictured: Rachael Kotarski (BL) and Sherry Lake (attending remotely from UVA). Low resolution screen capture of recorded meeting.

Image 2: Final Project Update Meeting

February 8, 2022 monthly update meeting via Zoom to "cap off" 28 months of project work. Top row from left: Bertie Wooles (UP), Ellen Ramsey (UVA), Ilkay Holt (BL). Center row: Sherry Lake (UVA), Tom Giles (UP), Rachael Kotarski (BL). Bottom row: Elisa Barrett (UP).

Appendices

Appendix A: We Advanced Hyku, and You Can, Too

https://docs.google.com/document/d/1oB65bAWCoJtdiZqkeAOBFGpQXQTezMS7nm2UC8Nv3uc/edit?usp=sharing

Appendix B: Advancing Hyku Project Communication Plan

https://docs.google.com/document/d/1M9UAYviJjVLBwKdlBLP68QBkNQOYDNxn6ADC9z0Iv4A/edit#heading=h.hbiutirqx2qu

Appendix C: Architecture Review for Advancing Hyku

https://doi.org/10.18130/v3-k4an-w022

British Library Comments on Architecture and Iterative Approach, March 2022

The Architecture Review for Advancing Hyku Project was conducted by the British Library in June 2020 and it outlined eight aspects for the Hyku application including merging features to later versions of the software, multi-tenancy, interoperability with external systems, portability with cloud deployment, stability, scalability with increasing volume of data and the security for use of data as well as a secure model for tenant admins. This assessment was based on the British Library's Shared Research Repository application.

In the review report, it was advised to use an iterative approach for development and deployment of new functionalities with multiple work packages and transition-state-architectures in Hyku repository. A strong recommendation was to move away from the legacy monolithic architecture of the Hyku framework to a decoupled, modular components-based architecture, using a restful API approach. Using application-specific customizations as a monolithic plugin has led to difficulties in having stable versions, successful migration and impacted quality of the service delivery. A continued move toward a more modular and less monolithic architecture still has clear benefits for the British Library as a member of the community. But it would also benefit future community members looking to configure and contribute to the platform without creating a domino effect of bugs in new code and functionality contributions.

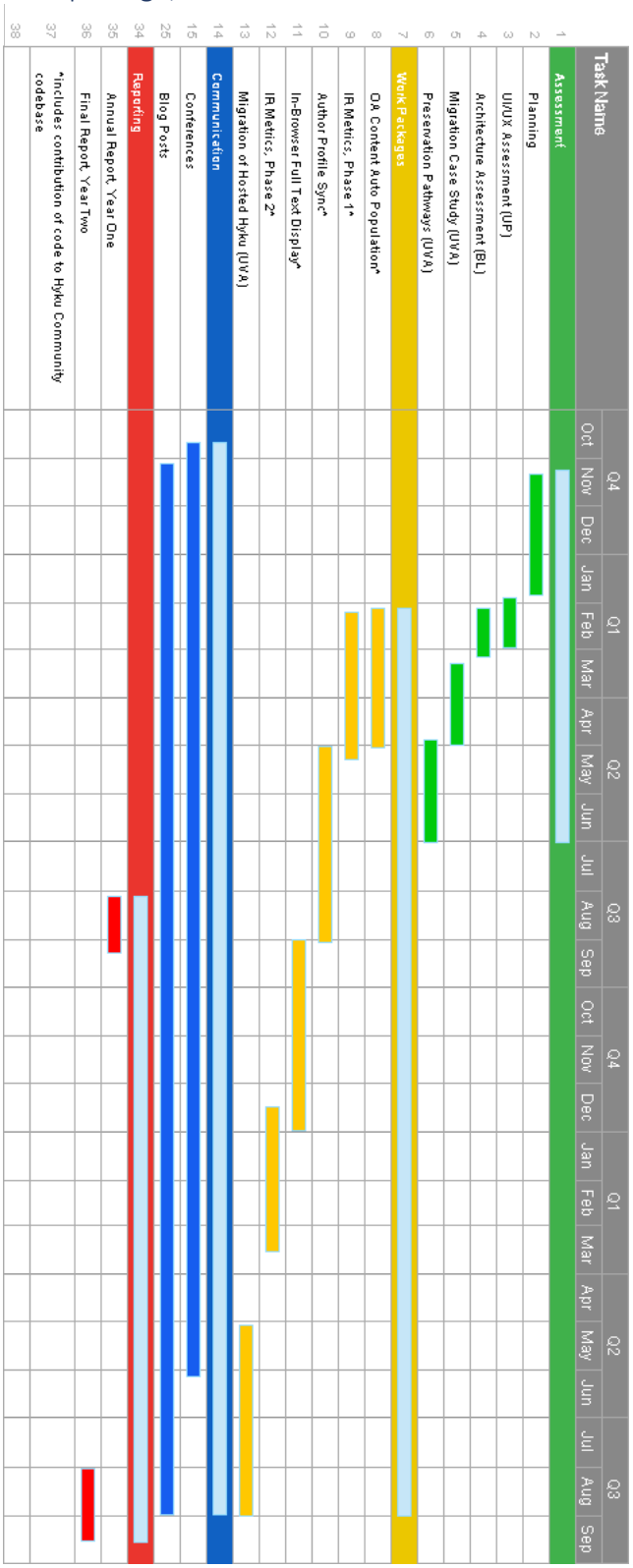
This should be taken hand-in-hand with contribution of new functionality back to the core product, which was also a key recommendation. Ubiquity Press made a great amount of progress on this by working closely with the community throughout the project, prioritizing the community needs, aligning the different versions of the Hyku application, and pushing the code back to the Samvera community. For future, it is advisable to avoid proprietary bespoke components and tools as much as possible, using the least amount of customized features, work

at the community-level for code development and deployment, and follow good practices as in the example of Shared Hyku Roadmap, initiated by the Advancing Hyku team, to overview the work across the community.

Appendix D: Hyku Community Roadmap

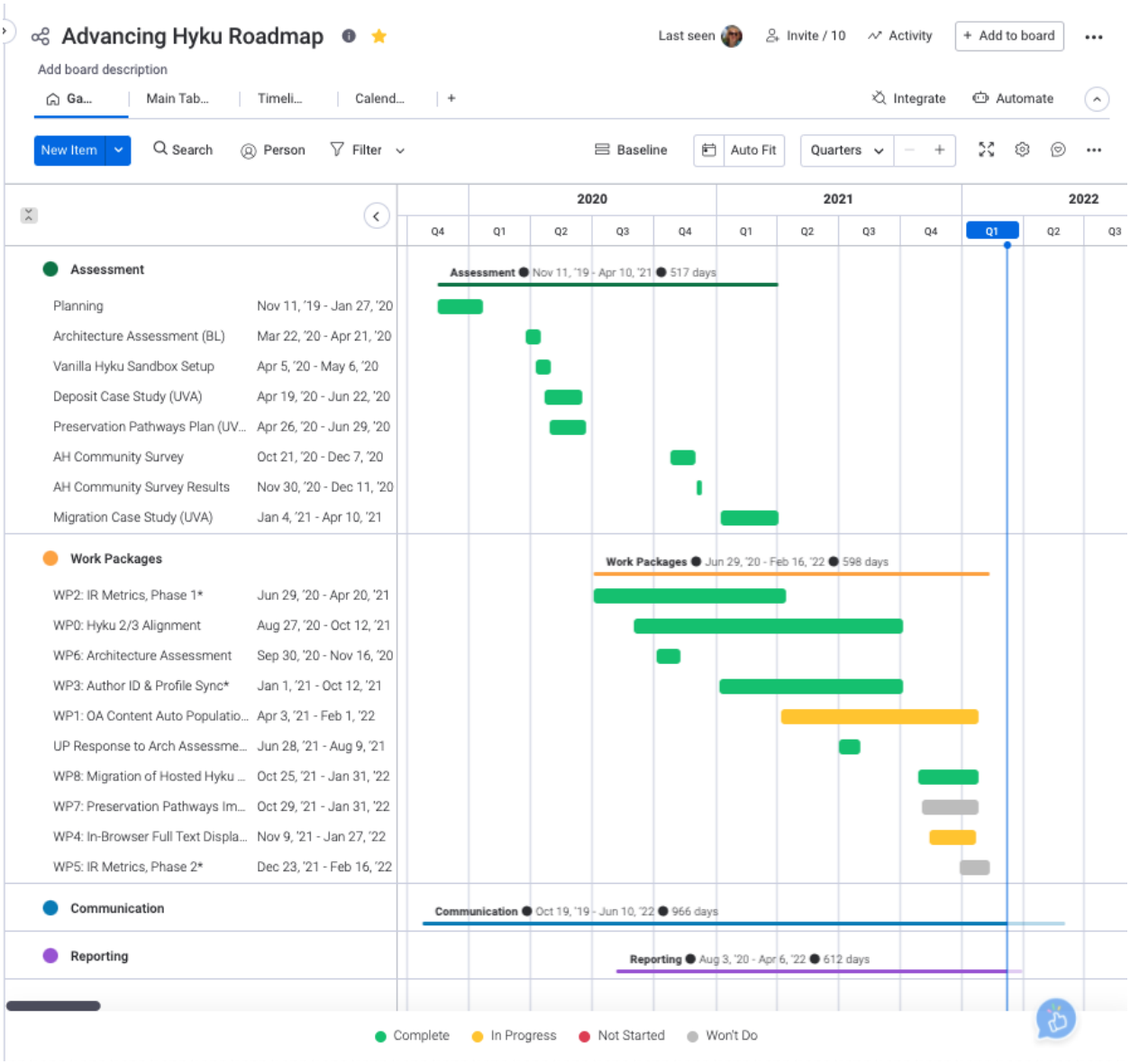
https://wiki.lyrasis.org/display/samvera/Hyku+Roadmap

Appendix E: Original Roadmap Image, October 2019



Appendix F: Year Two Roadmap Image, April 2021

Appendix G: End of Project Roadmap Image, March 2022



Appendix H: Ubiquity Press Report

Ubiquity Press End of Project Report

As part of the Advancing Hyku project, Ubiquity Press has completed the design and development of the following features, grouped by work package. The majority of these features follow from the initial scope of the project, while others such as those in WP0 were implemented as a result of feedback from internal and external stakeholders in the community.

All code delivered by the project has already been or is about to be released as open source and merged with the Hyku core codebase in accord with the Samvera Community's practices.

All features developed are fully functional using the standard vanilla Hyku user interface. At the same time Ubiquity Press has contributed a REST API which enables all features to be displayed in alternative user interfaces. In the following we show the features in both the vanilla Hyku UI, but also in those of 3rd parties that are making use of the code released to date, such as Ubiquity Press and notch8.

Contents

WP0: Hyku 2/3 alignment
- DOI Minting + DOI minting through Bulkrax
- Auto-population of metadata from DOI
- Auto-expiration of embargoes and leases
- Custom Work Types and Extended Metadata Attributes
- Cross Tenant Search
- JSON Metadata Fields
- CSV Imports / Exports (Bulkrax)
- File Availability Faceting
- OAI-PMH
- Research Information Systems (RIS) citation related export
- Read-only REST API

WP1: Auto-population of repository with OA content
WP2: Metrics phase 1
WP3: Sync all items in the repositories with author identification and profile services
WP4: Enable reading, commenting and annotating
Measures of uptake

WP0: Hyku 2/3 alignment

The overarching goal of this work package was to bring the enhancements to Hyku that Ubiquity Press had developed for the British Library using the Hyku 1 codebase into the latest version of Hyku (Hyku 2 and then 3).

This was to achieve the following benefits:

- Ensure that all features developed function on the latest version of Hyku, and are available for use by the wider Samvera community.
- Isolate Ubiquity Press customizations to allow for easier deployment and upgrades.
- Align with Samvera community standards: increase code coverage (testing), apply community coding style standards, put community developer documents in place (Code of Conduct, Contributors, etc.).
- Consider the recommendations contained in Architecture Review for Advancing Hyku Project compiled by the British Library, specifically "Merging – features from Hyku community into current BL's version and vice versa."

List of features included:

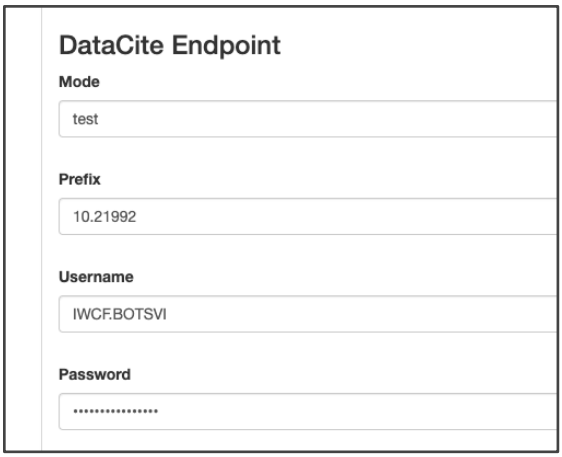
1. DOI Minting + DOI minting through Bulkrax
2. Auto-population of metadata from DOI
3. Auto-expiration of embargoes and leases
4. Custom Work Types and Extended Metadata Attributes
5. Cross Tenant Search
6. JSON Metadata Fields
7. CSV Imports / Exports (Bulkrax)
8. File Availability Faceting
9. OAI-PMH
10. Research Information Systems(RIS) citation related export
11. Read-only REST API

These features are described and shown in the following sections.

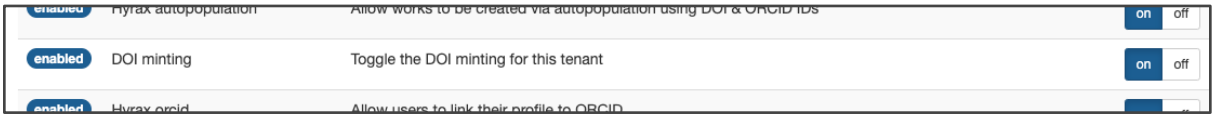
DOI Minting + DOI minting through Bulkrax

DOIs are important for ensuring that repository contents are citable and that usage metrics can be collected. They also ensure the broader indexing of repository content, and encourage greater use of the repository by researchers who see this as a best practice for having their work professionally disseminated.

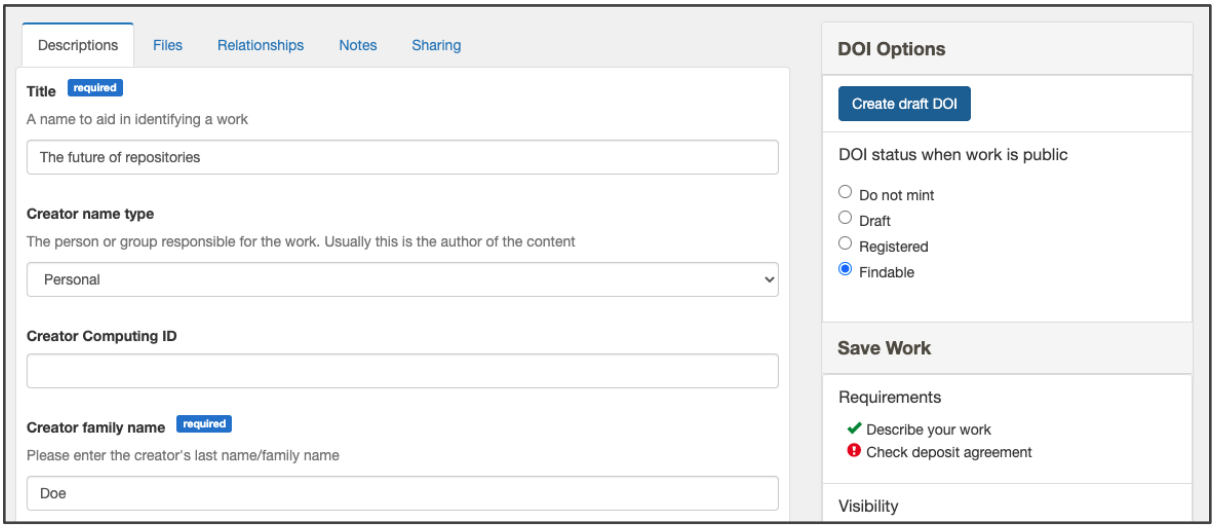
The feature uses DataCite DOIs, which are suitable for all kinds of repository content. It is now possible to assign DOIs either individually to works in Hyku, or en masse during the bulk import process.



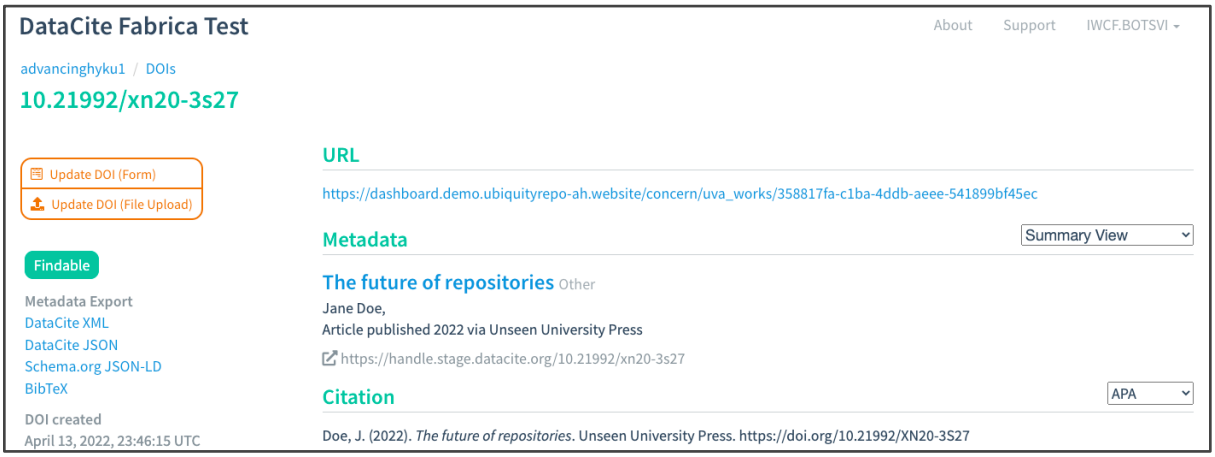
DataCite credentials added to tenant 'edit' page in standard Hyku instance admin interface.



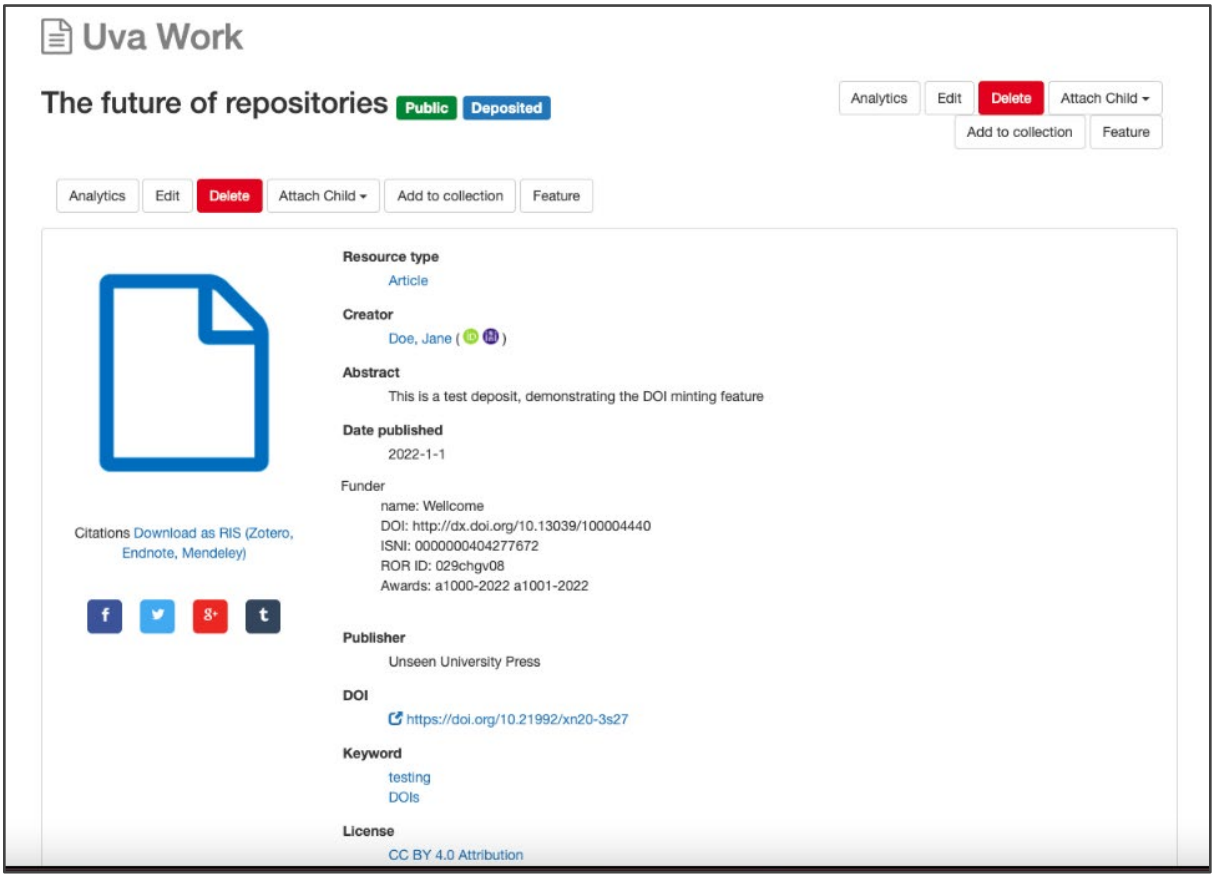
Feature switch added to standard Hyku dashboard to enable/disable ability to mint DOIs.



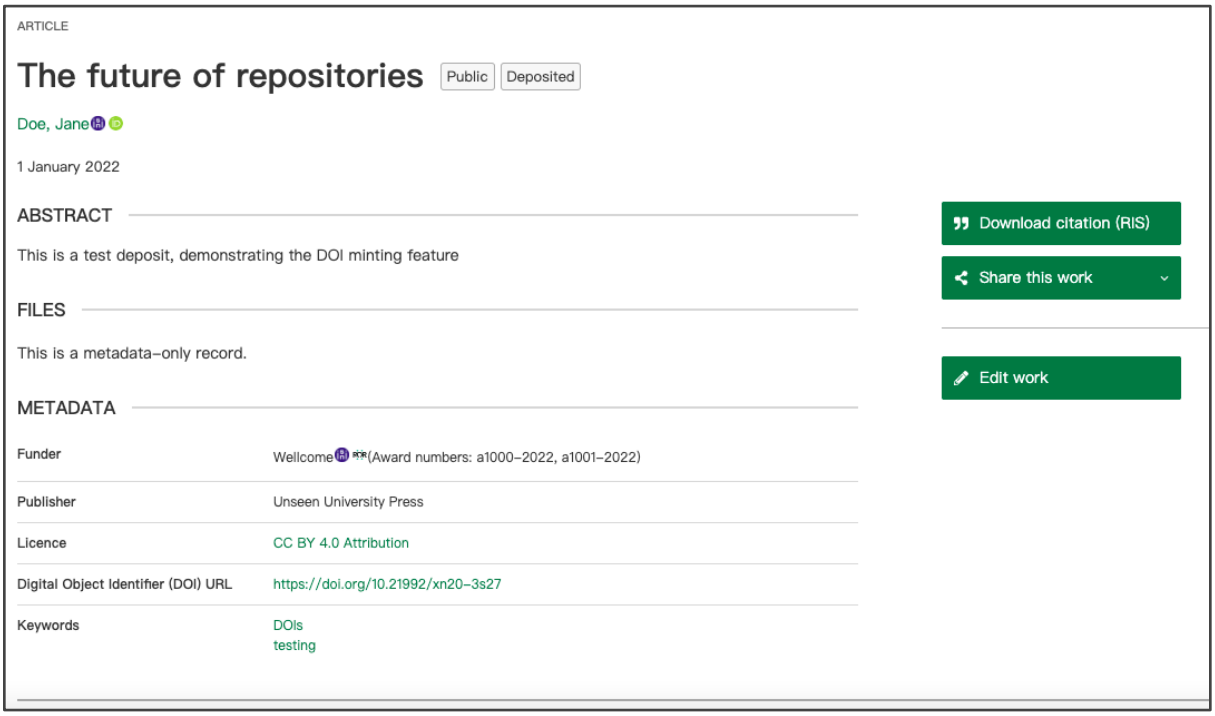
Additional DOI options added to the right-hand side of the deposit form in the standard Hyku dashboard.



Example of a successfully minted DOI in DataCite (note that DOIs minted in the DataCite Test environment do not resolve).



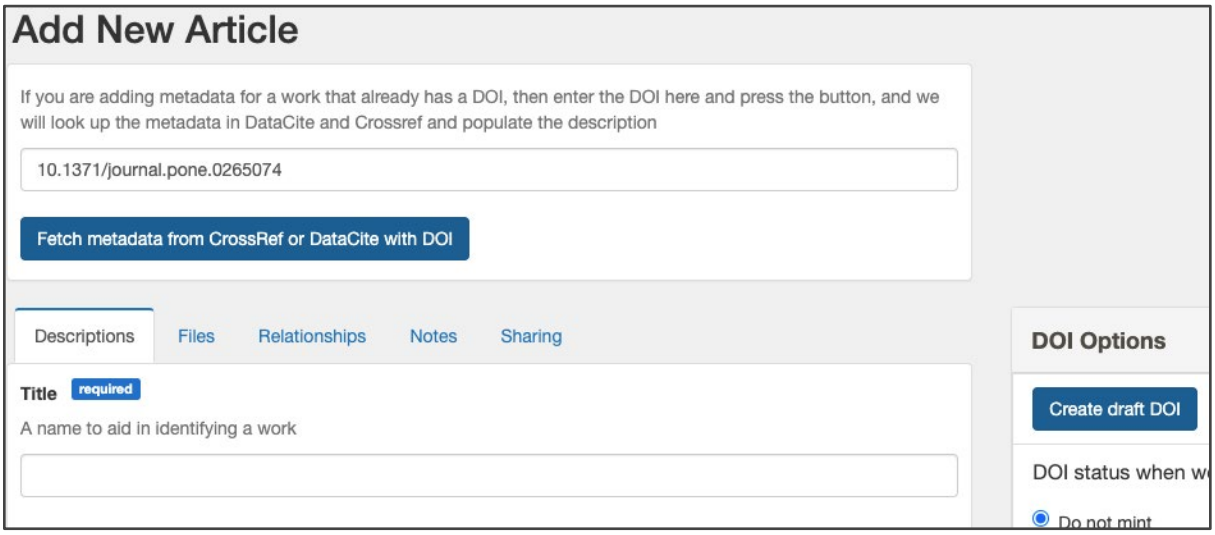
Work landing page (in the standard Hyku UI) showing the DOI assigned by DataCite, which was automatically inserted into the metadata.



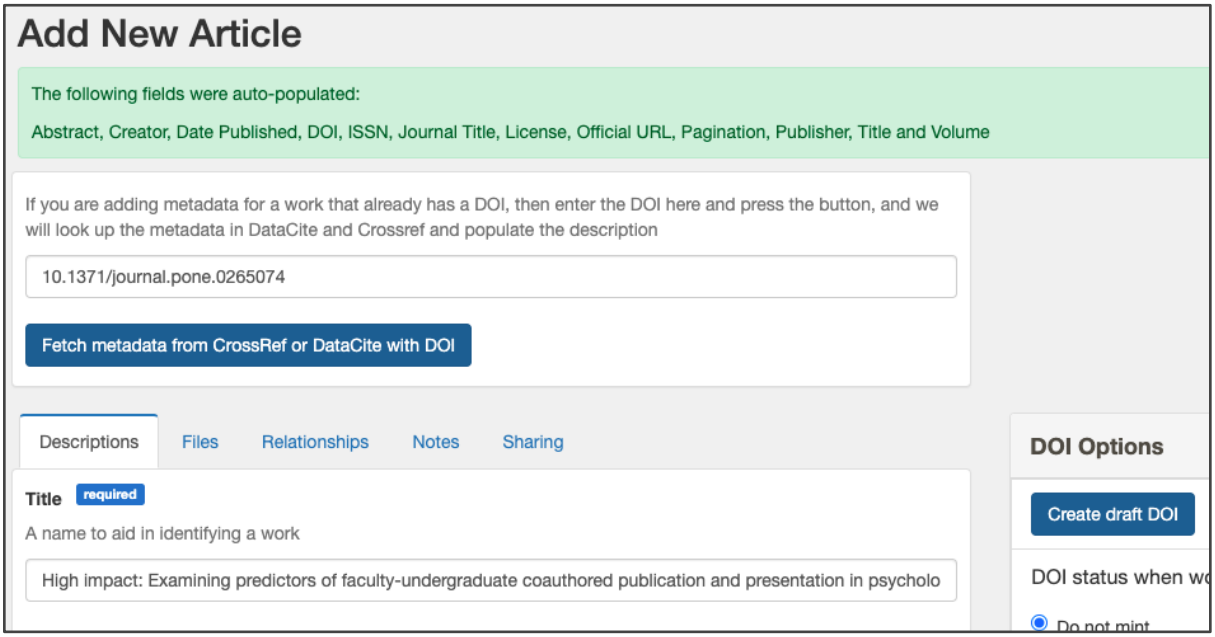
Work landing page (in the Ubiquity UI) showing the DOI assigned by DataCite, which was automatically inserted into the metadata.

Auto-population of metadata from DOI

This feature enables a repository user or manager to quickly auto-populate the metadata for a published work by entering the publisher's DOI. This makes the deposit of a work quick and simple, and ensures quality metadata. Quality and consistency of metadata is of course very important from the perspective of the host institution or library, but also critical for successful indexing in services such as Google Scholar.



Portion of deposit form showing new DOI autofill box, with example PLoS article DOI added by user, before pressing 'fetch metadata' button (in standard Hyku dashboard).

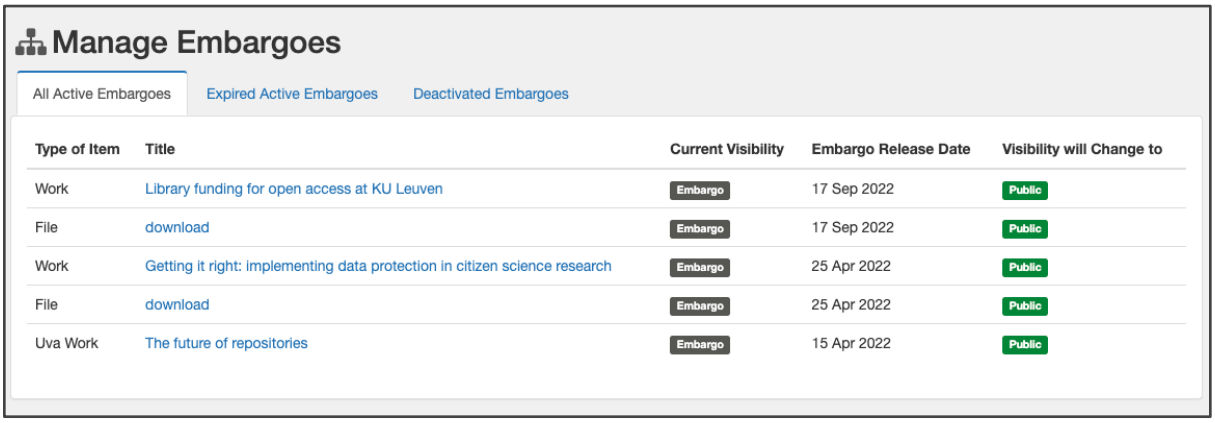


Portion of deposit form with message showing fields have been auto-populated into the form from Crossref (DataCite also supported), after pressing 'fetch metadata' button (in standard Hyku dashboard).

Auto-expiration of embargoes and leases

Until now Hyku had supported the entry of embargo and lease dates for content, but it did not automatically change the status of works at those dates. This feature ensures that embargoed and

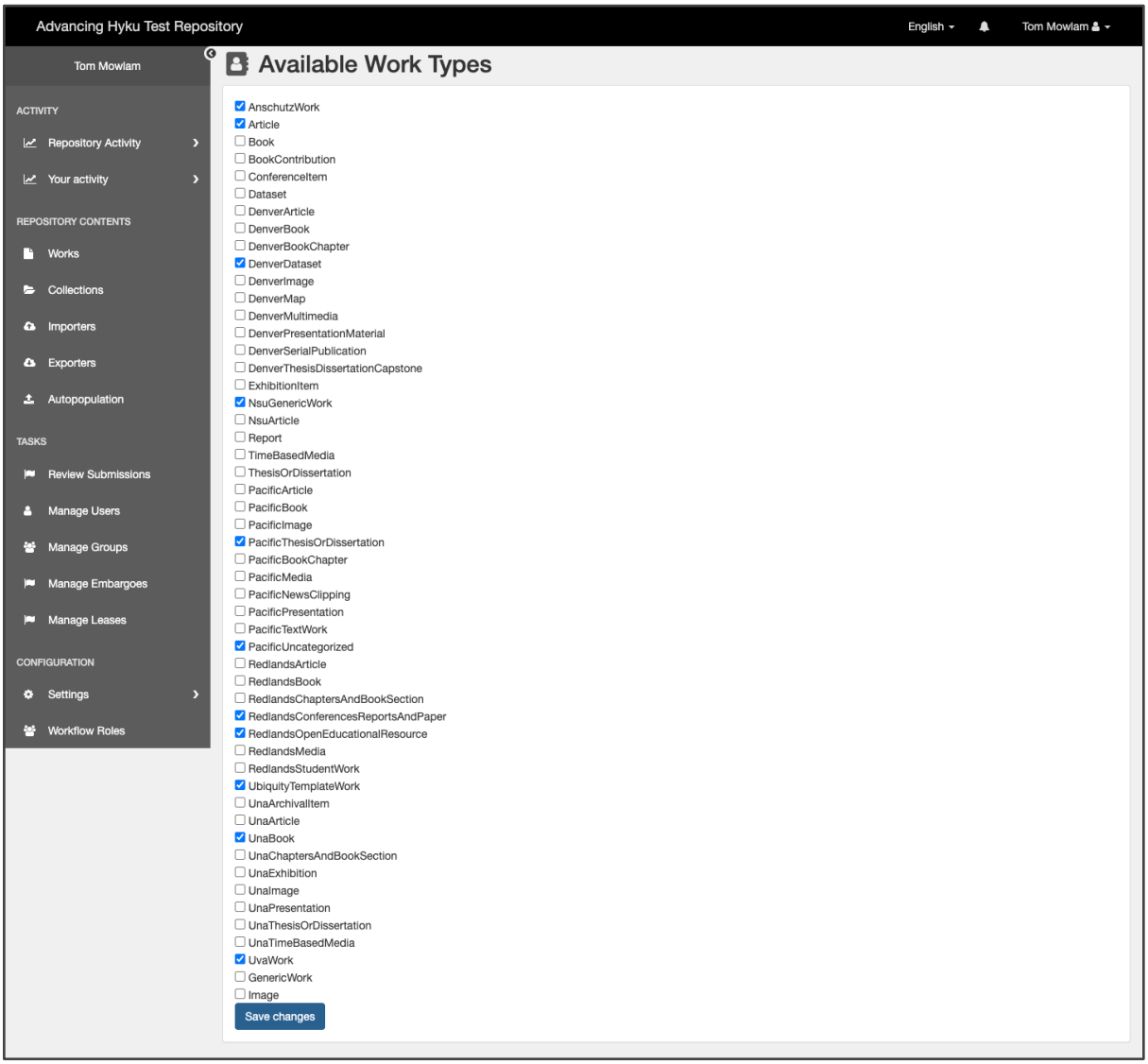
leased content is reliably made available and removed from public view, respectively, as expected by users.



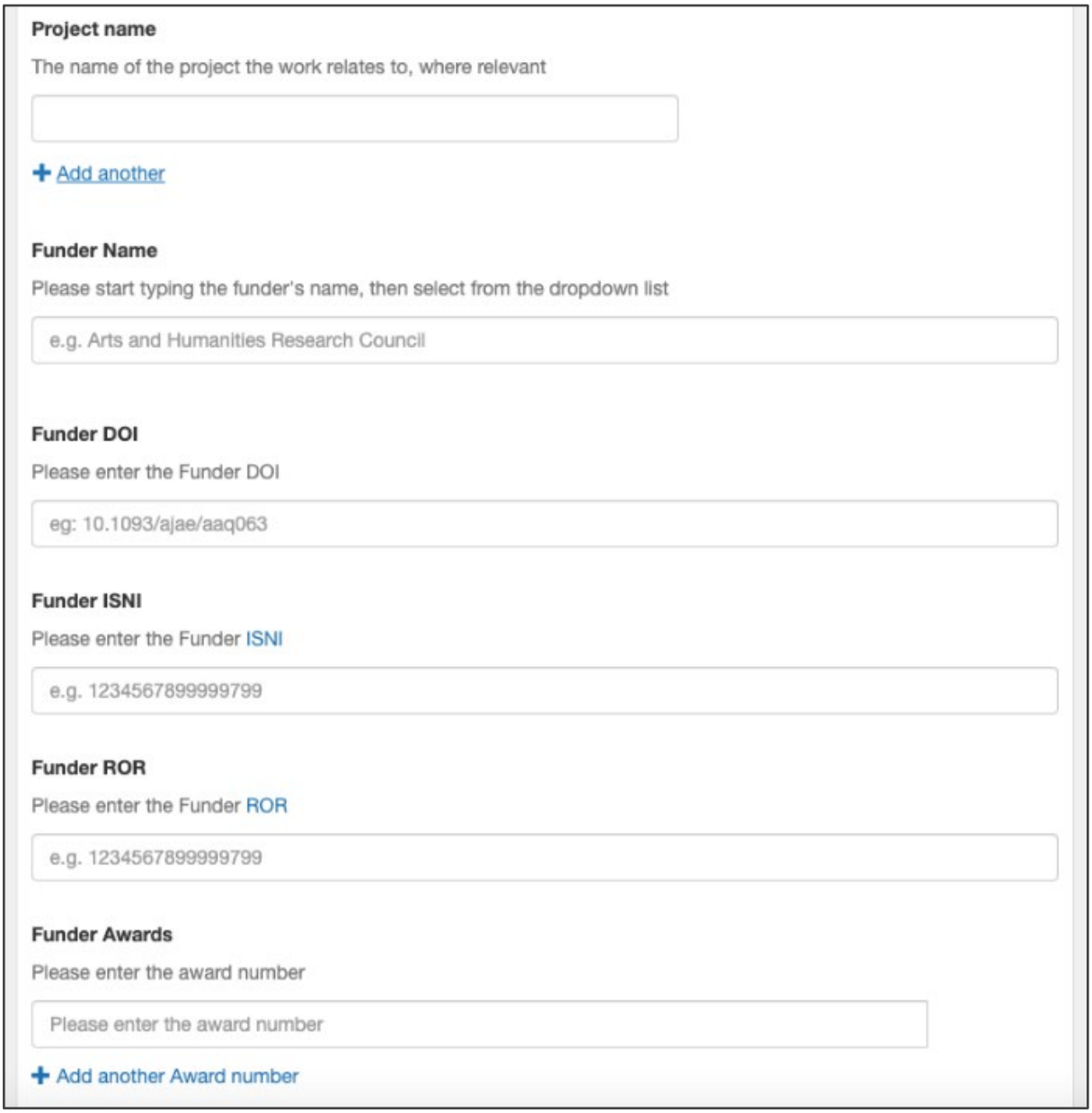
Embargo management page in standard Hyku dashboard (no change by UP to the interface, but embargoes/leases now auto-expire when date is reached).

Custom Work Types and Extended Metadata Attributes

This feature adds new work types and new metadata elements to Hyku to extend support to a wider range of content types, and improve the richness, discoverability and re-use of the metadata, for example including funder and project information for research, extent/duration for multimedia content, target audience for open educational resources etc.



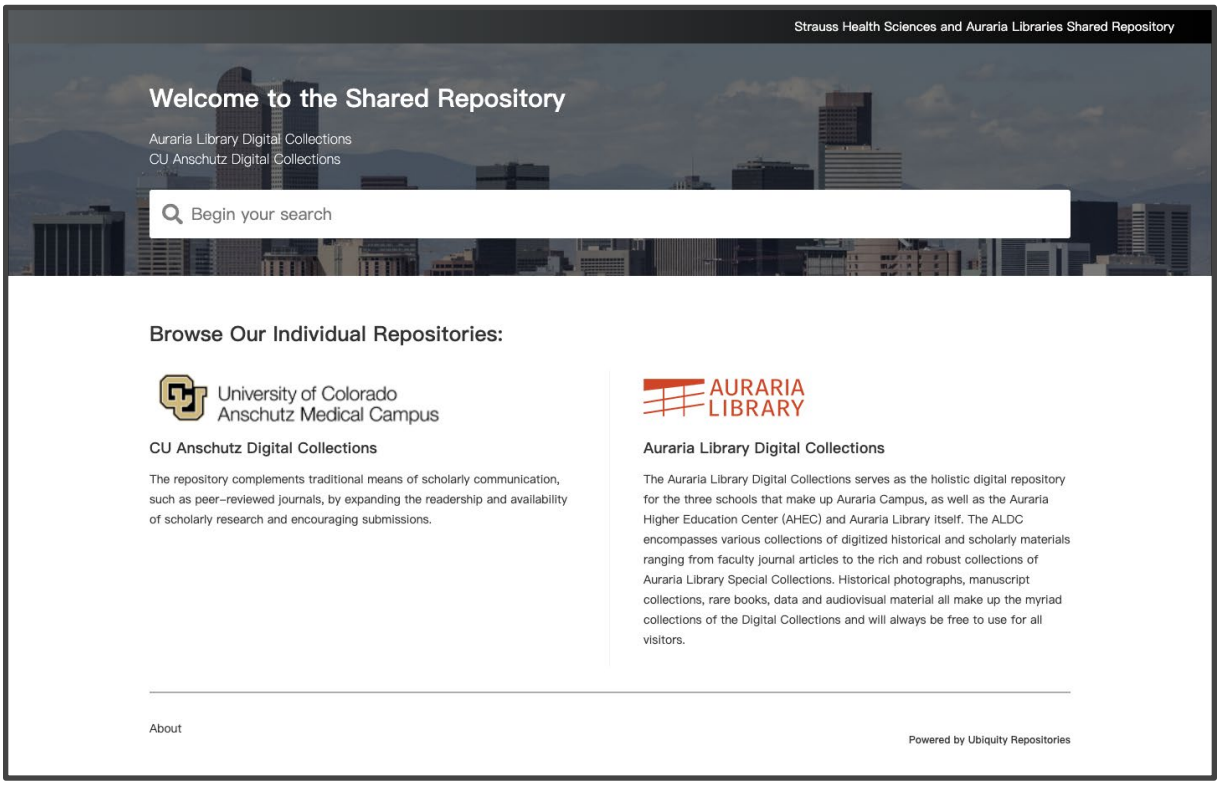
List of 52 work types now supported by the Ubiquity platform in the standard Hyku dashboard (of which 7 were added as part of the Advancing Hyku project).



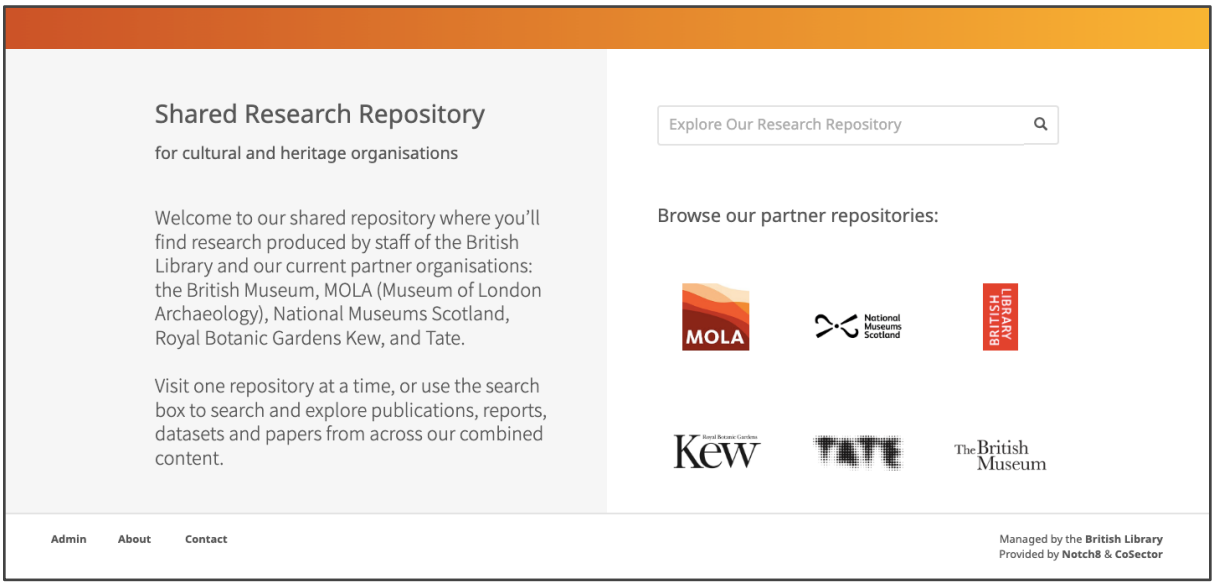
Portion of deposit form showing examples of extended metadata (funder fields, where funder name auto-suggests and auto-inserts the funder DOI via Crossref's FundRef database), implemented in standard Hyku dashboard.

Cross Tenant Search

As a multi-tenant capable platform, Hyku is ideally suited to use in consortia or by other groups of institutions. Ubiquity Press had initially developed a shared search layer for the British Library, and this has now been ported into Hyku 3.



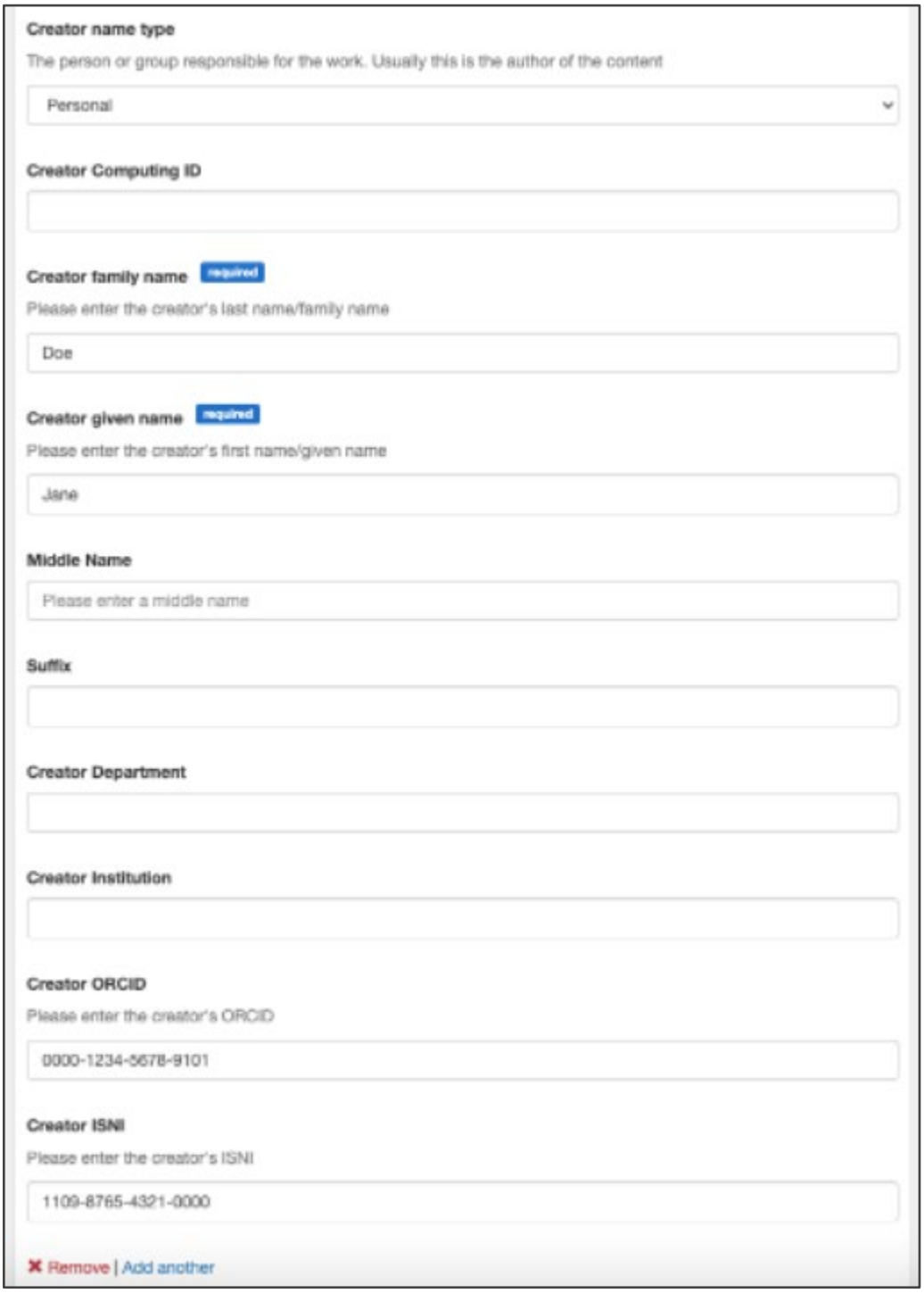
Shared search interface for live Ubiquity Press customers (in the Ubiquity UI).



Shared search interface for live British Library customers (in Notch8's UI).

JSON Metadata Fields

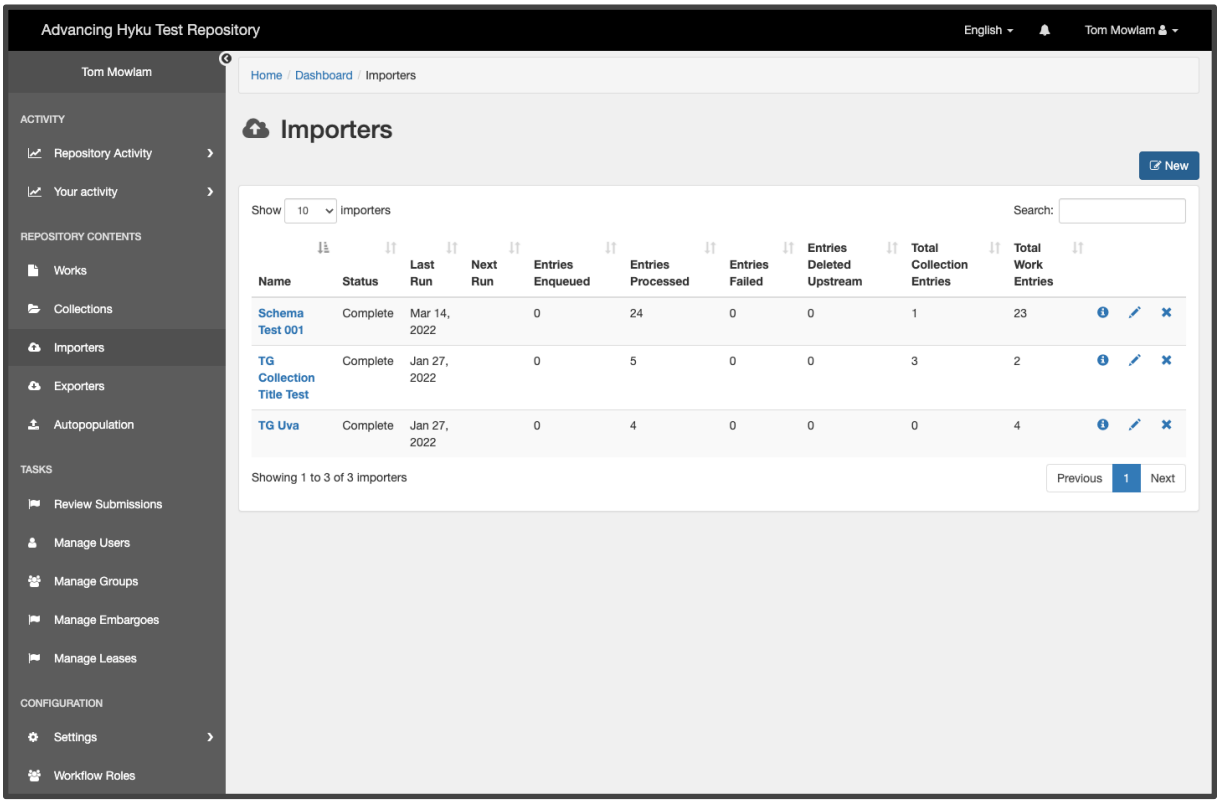
This feature involved the re-implementation of how Hyku structures and stores its metadata fields. This enables rich and granular metadata to be collected. For example, in the original implementation of Hyku a creator was represented by one name field only, while there are now multiple fields associated with each creator, as expected by users.



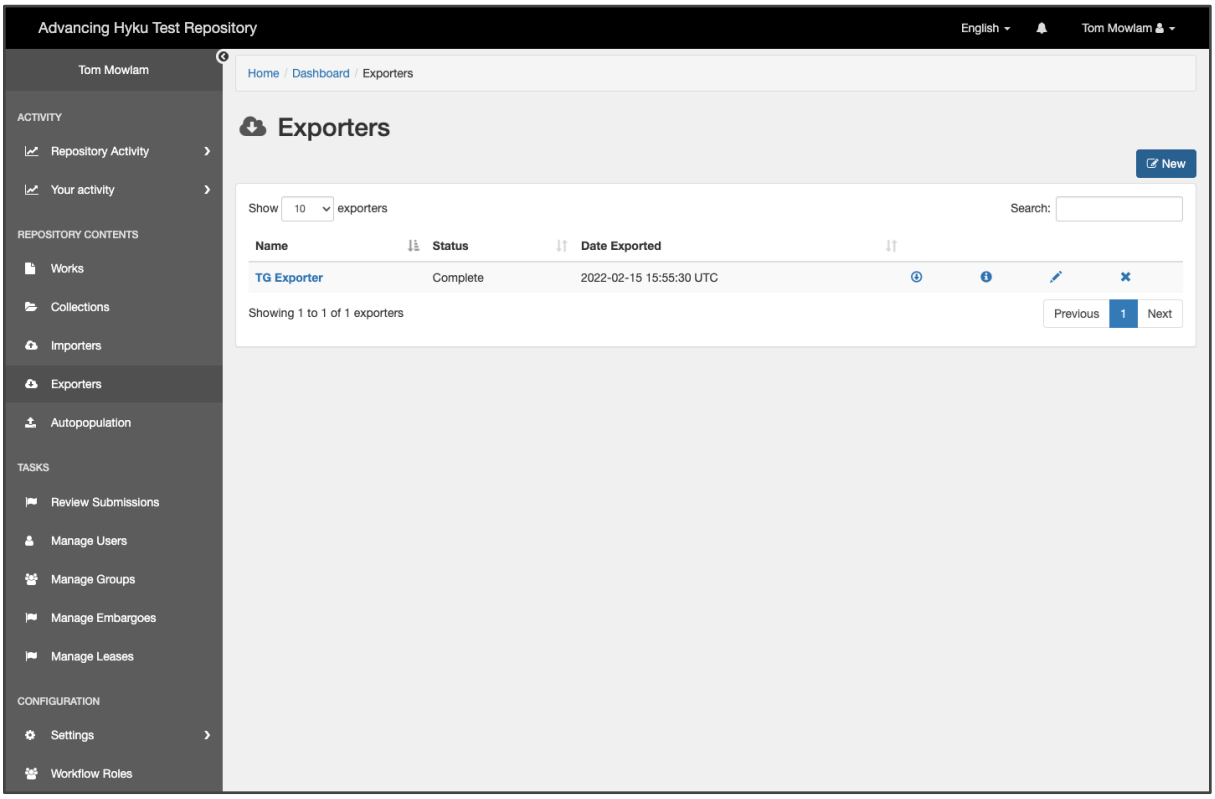
Portion of deposit form showing structured creator data (previously there was just a single 'creator name' field, not split into name parts and without ORCID, ISNI etc); implemented in standard Hyku dashboard.

CSV Imports / Exports (Bulkrax)

This feature expanded and improved the Bulkrax import and export tool for repository works, to ensure that it worked reliably, and with more complex fields such as those described above. The system was also extended to include the bulk minting of DOIs.



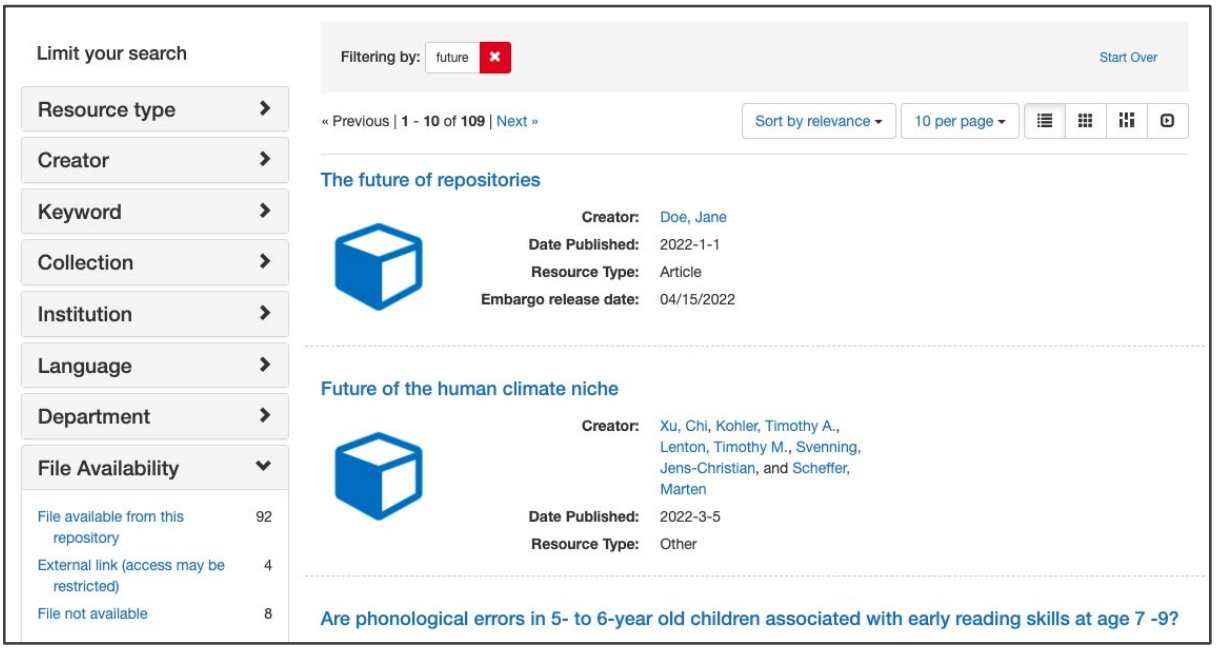
CSV import management page in the standard Hyku dashboard - significant work from UP was to extend Bulkrax to support complex fields (e.g. creators, funders, related identifiers), and to support batch DOI minting on import.



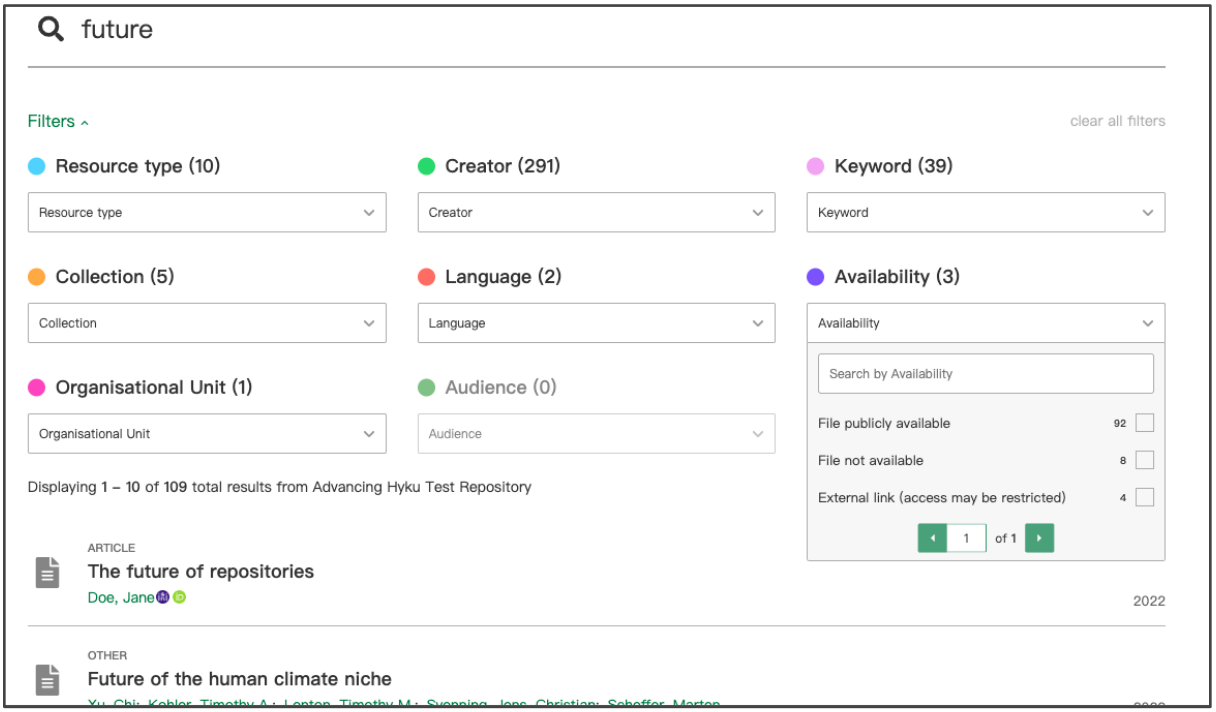
CSV export management page in the standard Hyku dashboard - significant work was to extend support to new and complex fields.

File Availability Faceting

Not all works or files deposited to a repository are publicly available. This feature added a facet to searching, by which users could opt to include or hide non-public items in their search results.



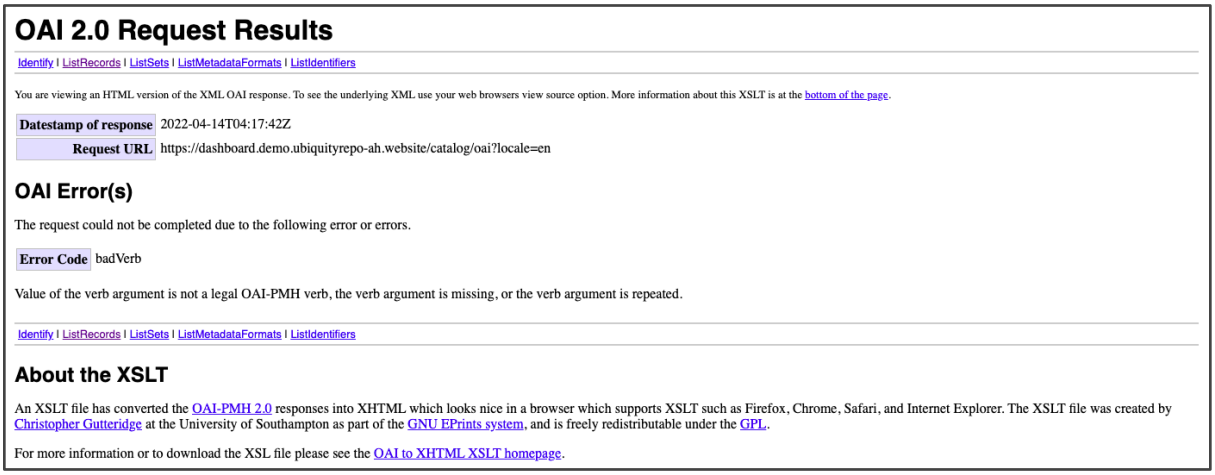
Standard Hyku UI search interface, showing new 'file availability' facet, enabling users to easily identify works with publicly-available files.



Ubiquity Press UI search interface, showing new 'file availability' facet, enabling users to easily identify works with publicly-available files.

OAI-PMH

This feature makes OAI-PMH available for Hyku repositories. This was a key missing feature that was a roadblock to adoption by many institutions.



OAI 2.0 Request Results

Identify | ListRecords | ListSets | ListMetadataFormats | ListIdentifiers

You are viewing an HTML version of the XML OAI response. To see the underlying XML use your web browsers view source option. More information about this XSLT is at the bottom of the page.

Datestamp of response	2022-04-14T04:17:42Z
Request URL	https://dashboard.demo.ubiquityrepo-ah.website/catalog/oai?locale=en

OAI Error(s)

The request could not be completed due to the following error or errors.

Error Code badVerb

Value of the verb argument is not a legal OAI-PMH verb, the verb argument is missing, or the verb argument is repeated.

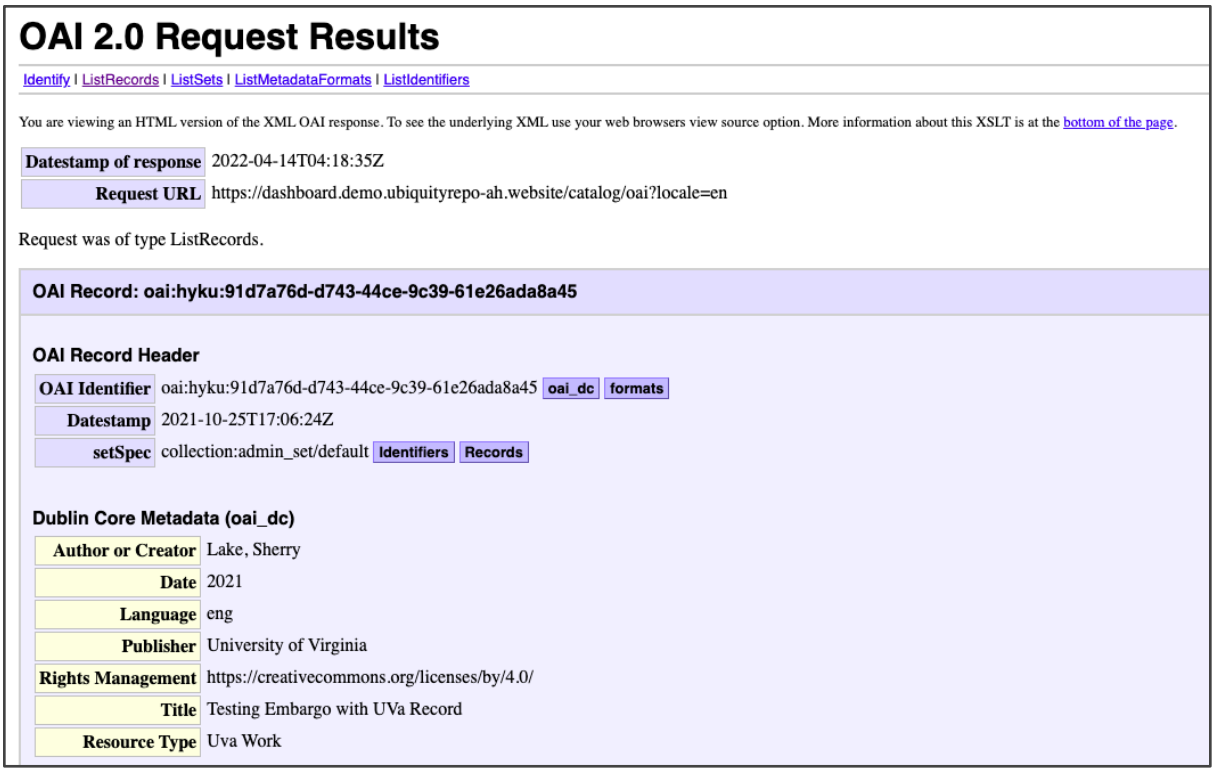
Identify | ListRecords | ListSets | ListMetadataFormats | ListIdentifiers

About the XSLT

An XSLT file has converted the OAI-PMH 2.0 responses into XHTML which looks nice in a browser which supports XSLT such as Firefox, Chrome, Safari, and Internet Explorer. The XSLT file was created by Christopher Gutteridge at the University of Southampton as part of the GNU EPrints system, and is freely redistributable under the GPL.

For more information or to download the XSL file please see the OAI to XHTML XSLT homepage.

New OAI-PMH landing page implemented in the standard Hyku UI.



OAI 2.0 Request Results

Identify | ListRecords | ListSets | ListMetadataFormats | ListIdentifiers

You are viewing an HTML version of the XML OAI response. To see the underlying XML use your web browsers view source option. More information about this XSLT is at the bottom of the page.

Datestamp of response	2022-04-14T04:18:35Z
Request URL	https://dashboard.demo.ubiquityrepo-ah.website/catalog/oai?locale=en

Request was of type ListRecords.

OAI Record: oai:hyku:91d7a76d-d743-44ce-9c39-61e26ada8a45

OAI Record Header

OAI Identifier	oai:hyku:91d7a76d-d743-44ce-9c39-61e26ada8a45 **oai_dc** **formats**
Datestamp	2021-10-25T17:06:24Z
setSpec	collection:admin_set/default **Identifiers** **Records**

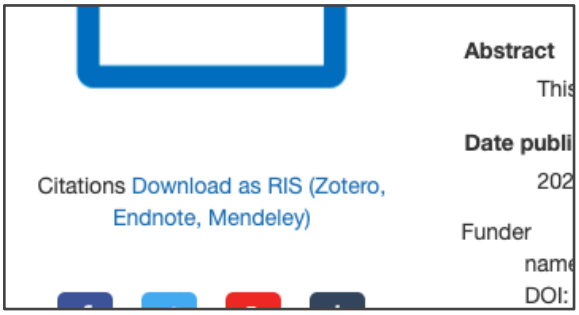
Dublin Core Metadata (oai_dc)

Author or Creator	Lake, Sherry
Date	2021
Language	eng
Publisher	University of Virginia
Rights Management	https://creativecommons.org/licenses/by/4.0/
Title	Testing Embargo with UVa Record
Resource Type	Uva Work

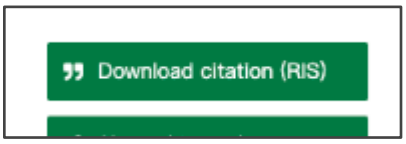
Portion of OAI-PMH ‘list records’ page in the standard Hyku UI.

Research Information Systems (RIS) citation related export

This feature makes it possible for users to download the citations for works in Hyku in the common RIS format. This is a standard repository feature that encourages correct citation using a work's DOI, and thus makes it possible to track the citation. This is also a feature which encourages researchers to deposit, as they know that efforts are being made to ensure their work is widely read and cited.



Portion of standard Hyku UI work landing page showing RIS download link.



Portion of Ubiquity Press UI work landing page showing RIS download link.

```
TY  - GEN
T1  - The future of repositories

DO  - https://doi.org/10.21992/xn20-3s27
AU  - Doe, Jane
AB  - This is a test deposit, demonstrating the DOI minting feature
KW  - testing
KW  - DOIs
DA  - 2022-1-1
PY  - 2022
PB  - Unseen University Press
ER  -
```

RIS output for a test work.

Read-only REST API

A REST-API has been provided to enable both the implementation of custom repository user interfaces such as the Ubiquity Press version, and for reuse of repository content in other locations.

```
{
   uuid: "8550dc3a-1a26-409b-8f78-7119297f2ef6",
   abstract: "Recurrent seizure activity can lead to the production of excess reactive
   adapted_from: null,
 - additional_info: [
       "Fall",
       "Includes bibliographical references."
   ],
   additional_links: null,
   admin_set_name: "Default Admin Set",
 - advisor: [
       "Patel, Manisha",
       "Day, Brian",
       "Huntsman, Molly"
   ],
   alternate_identifier: null,
   alternative_journal_title: null,
   alternative_book_title: null,
   alternative_title: null,
   article_number: null,
   audience: null,
   book_title: null,
   buy_book: null,
   challenged: null,
   citation: null,
   cname: "dashboard.digitalcollections.cuanschutz.edu",
 - committee_member: [
       "Shaodong, Dai",
       "Gonzalez, Marco"
   ],
 - creator: [
     - {
           creator_name_type: "Personal",
           creator_family_name: "Hari",
           creator_given_name: "Ashwini",
           creator_middle_name: "Sri",
           creator_profile_visibility: "closed"
       }
   ],
```


Portion of API endpoint for a work (full JSON available here) - API endpoints have been created for the repository homepage, search, and collections, all in the standard Hyku interface.

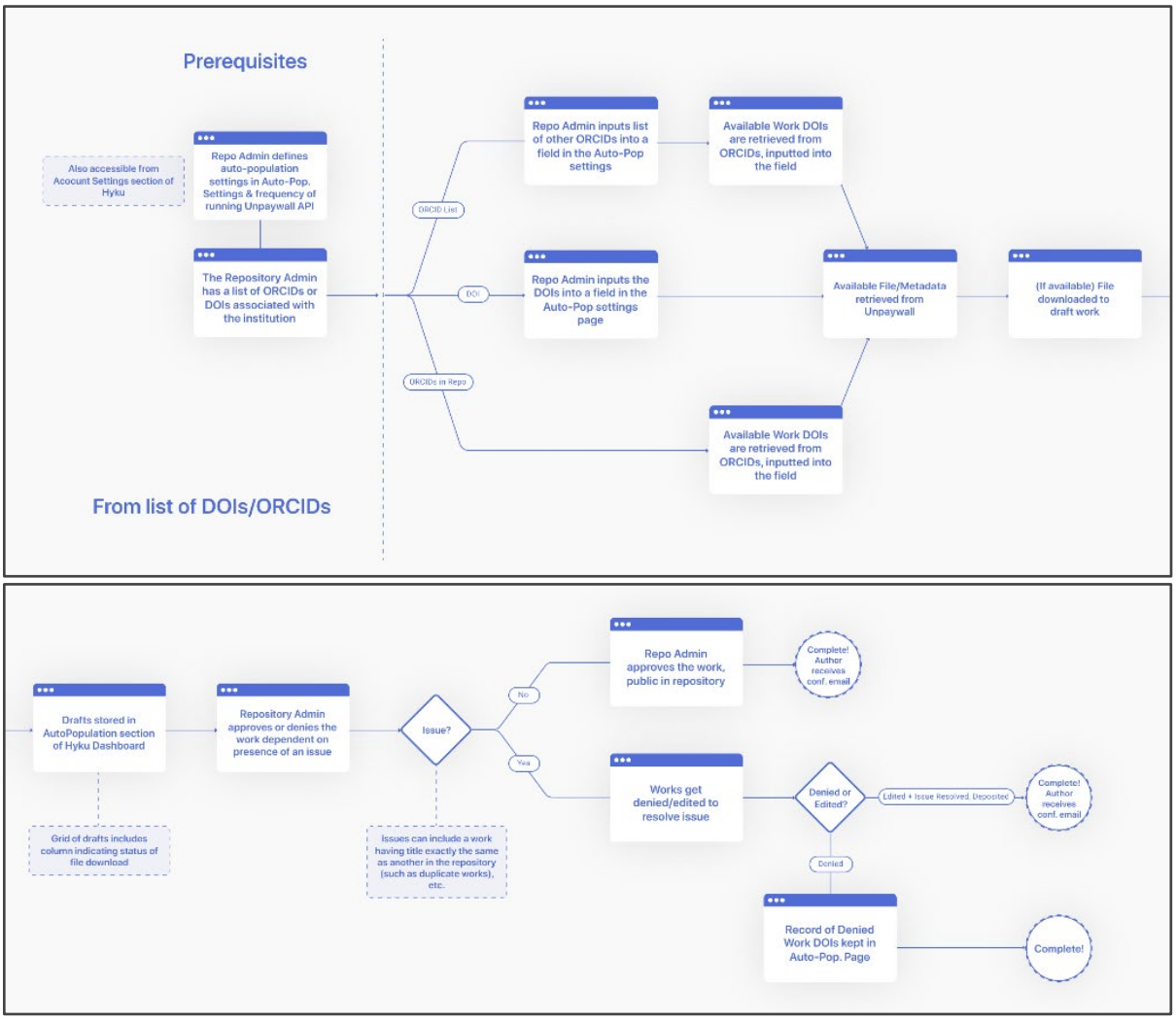
WP1: Auto-population of repository with OA content

This work package delivers the capability of automatically populating a Hyku repository with content (metadata and files) published by members of the host institution. This was originally to involve integration with individual OA publishers such as Ubiquity Press and PLOS, but a more efficient and scalable solution was found, using only the Unpaywall service and ORCID

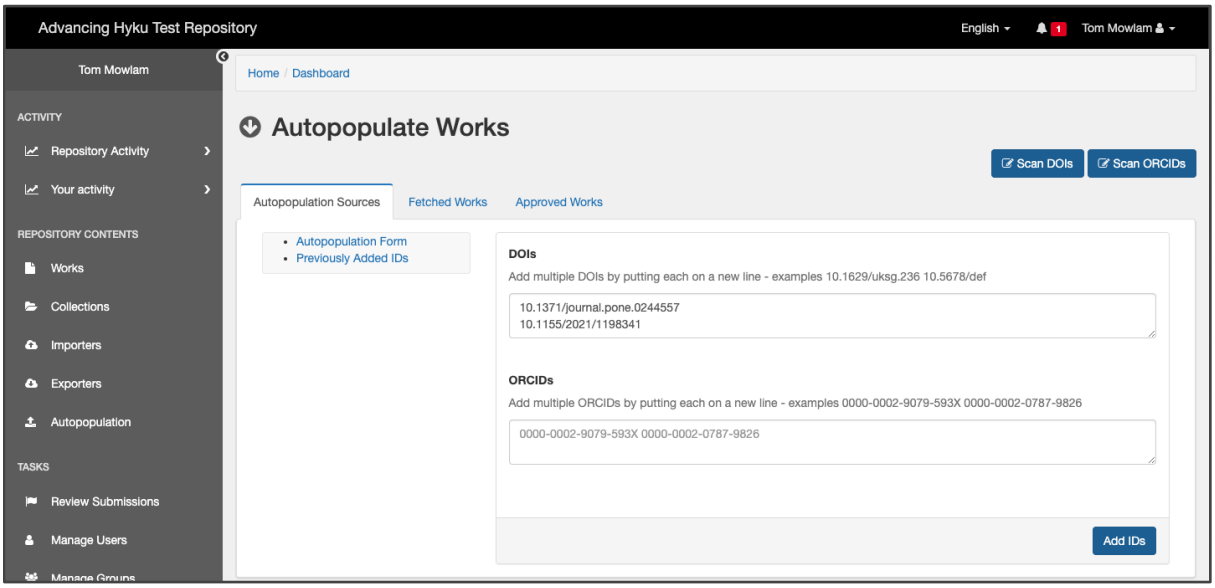
identifiers. This means that the feature works out of the box for all OA publishers, and does not require future modification to add new ones.

This enables institutions to quickly fill their repositories with publications, ensuring that the repositories are seen as authoritative collections and 'serious' places to deposit work. It also greatly reduces the workload for library and departmental staff, who no longer need to manually gather faculty publications.

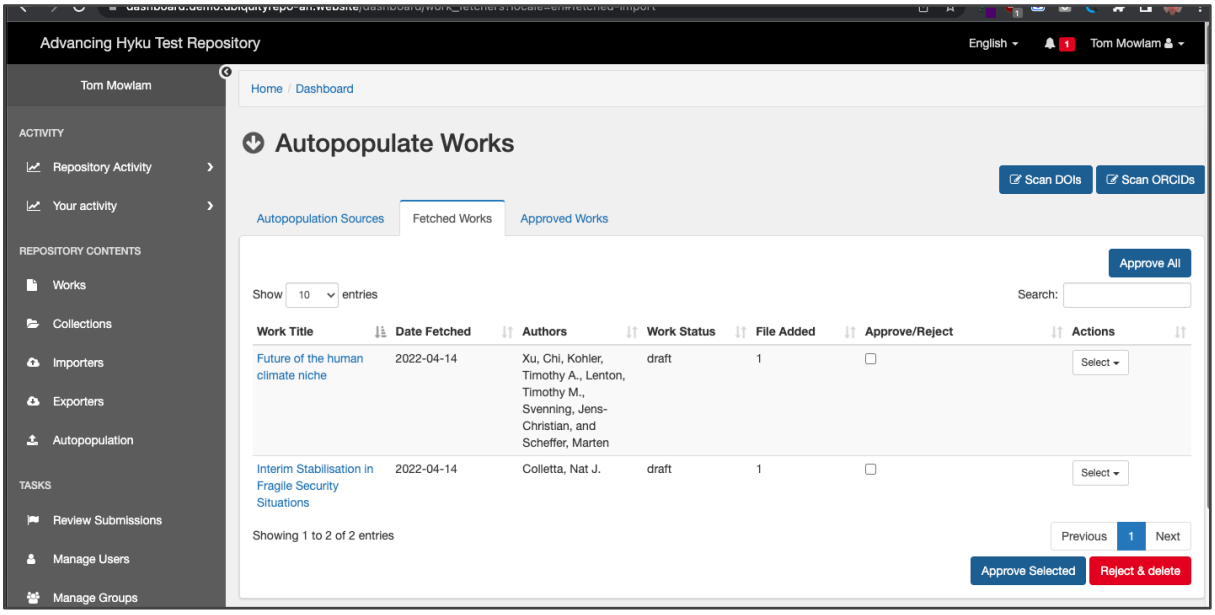
The metadata of auto-populated works is also automatically enhanced via Crossref during the import process.



Auto-population workflow



Interface to new auto-population tool in the standard Hyku dashboard, with 2 DOIs (one PLoS, one Hindawi) entered into the form.

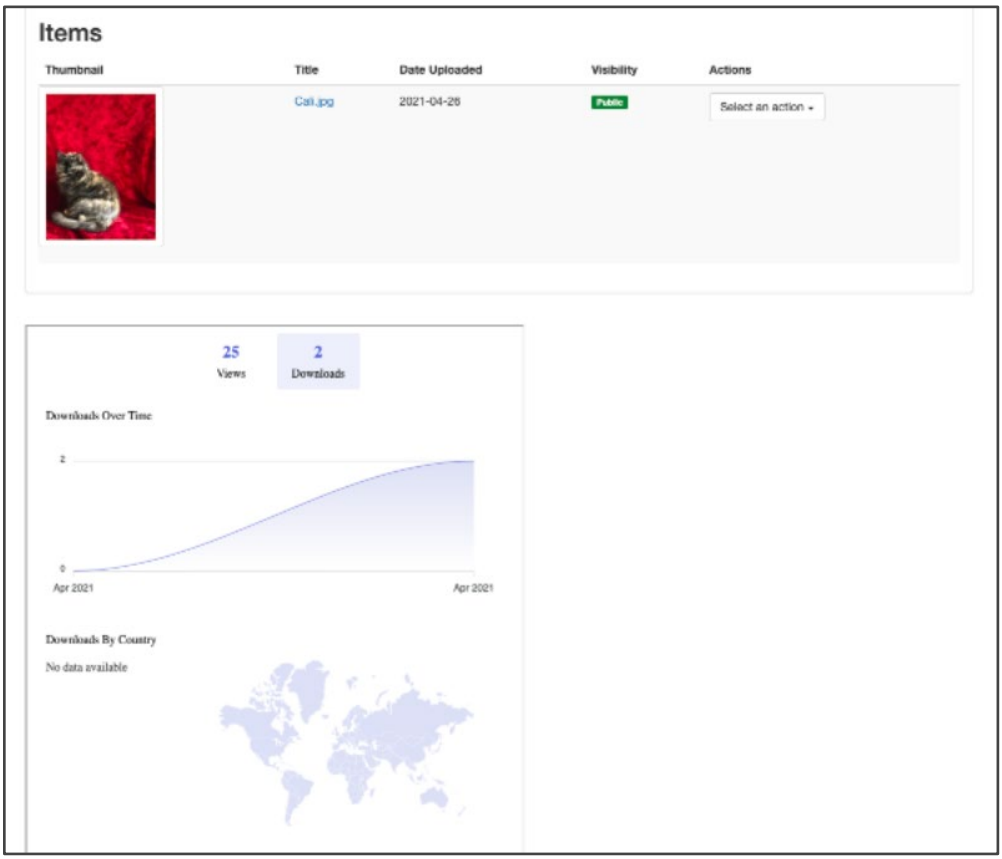


Result of 'fetch' process in the standard Hyku dashboard, with two works with PDF files ready for review and approval.

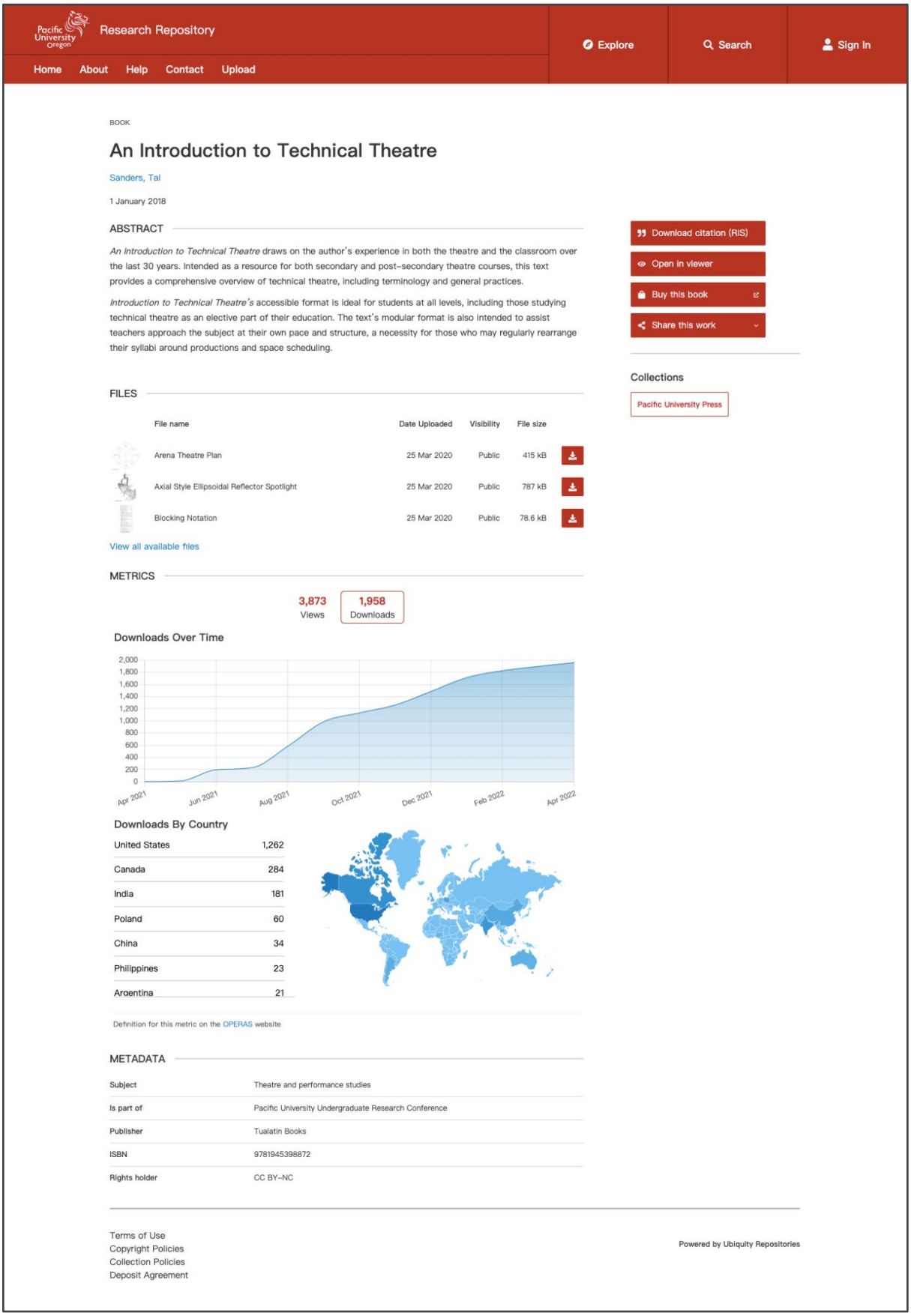
WP2: Metrics phase 1

This work package introduces publisher-style metrics to Hyku, so that views and downloads can be reliably tracked. These metrics are further placed in the context of time and geography.

This has involved the integration of the open source OPERAS Metrics service, co-developed by Ubiquity Press as part of the Horizon 2020 HIRMEOS project, and now managed and maintained by Ubiquity for the OPERAS community. This integration will allow the future expansion of the feature to include additional metrics such as citations, tweets and wikipedia mentions, as supported by OPERAS Metrics.



Portion of a standard Hyku UI work page showing views and downloads reported over time.



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BOOK

An Introduction to Technical Theatre

Sanders, Tal

1 January 2018

ABSTRACT

An Introduction to Technical Theatre draws on the author's experience in both the theatre and the classroom over the last 30 years. Intended as a resource for both secondary and post-secondary theatre courses, this text provides a comprehensive overview of technical theatre, including terminology and general practices.

Introduction to Technical Theatre's accessible format is ideal for students at all levels, including those studying technical theatre as an elective part of their education. The text's modular format is also intended to assist teachers approach the subject at their own pace and structure, a necessity for those who may regularly rearrange their syllabi around productions and space scheduling.

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Collections

Pacific University Press

FILES

File name	Date Uploaded	Visibility	File size
Arena Theatre Plan	25 Mar 2020	Public	415 kB
Axial Style Ellipsoidal Reflector Spotlight	25 Mar 2020	Public	787 kB
Blocking Notation	25 Mar 2020	Public	78.6 kB

View all available files

METRICS

3,873 Views | 1,958 Downloads

Downloads Over Time

Downloads By Country

United States	1,262
Canada	284
India	181
Poland	60
China	34
Philippines	23
Argentina	21

Definition for this metric on the OPERAS website

METADATA

Subject	Theatre and performance studies
Is part of	Pacific University Undergraduate Research Conference
Publisher	Tualatin Books
ISBN	9781945398872
Rights holder	CC BY-NC

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Collection Policies
Deposit Agreement

Powered by Ubiquity Repositories

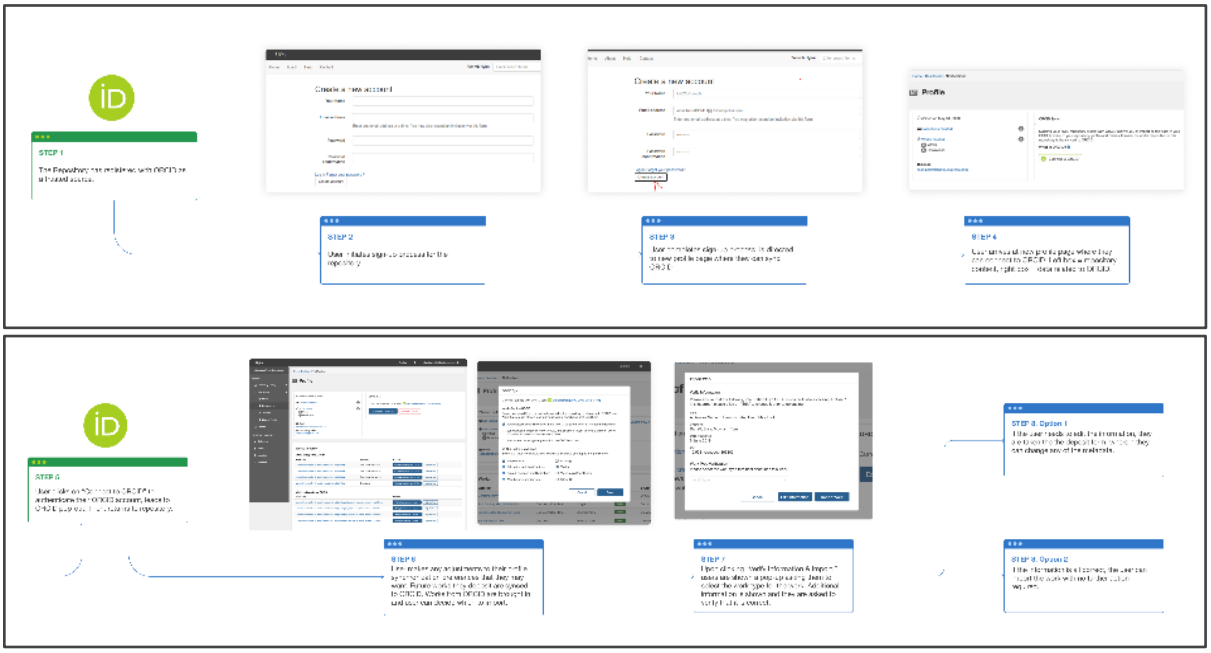
Ubiquity UI work page showing views and downloads reported over time.

WP3: Sync all items in the repositories with author identification and profile services

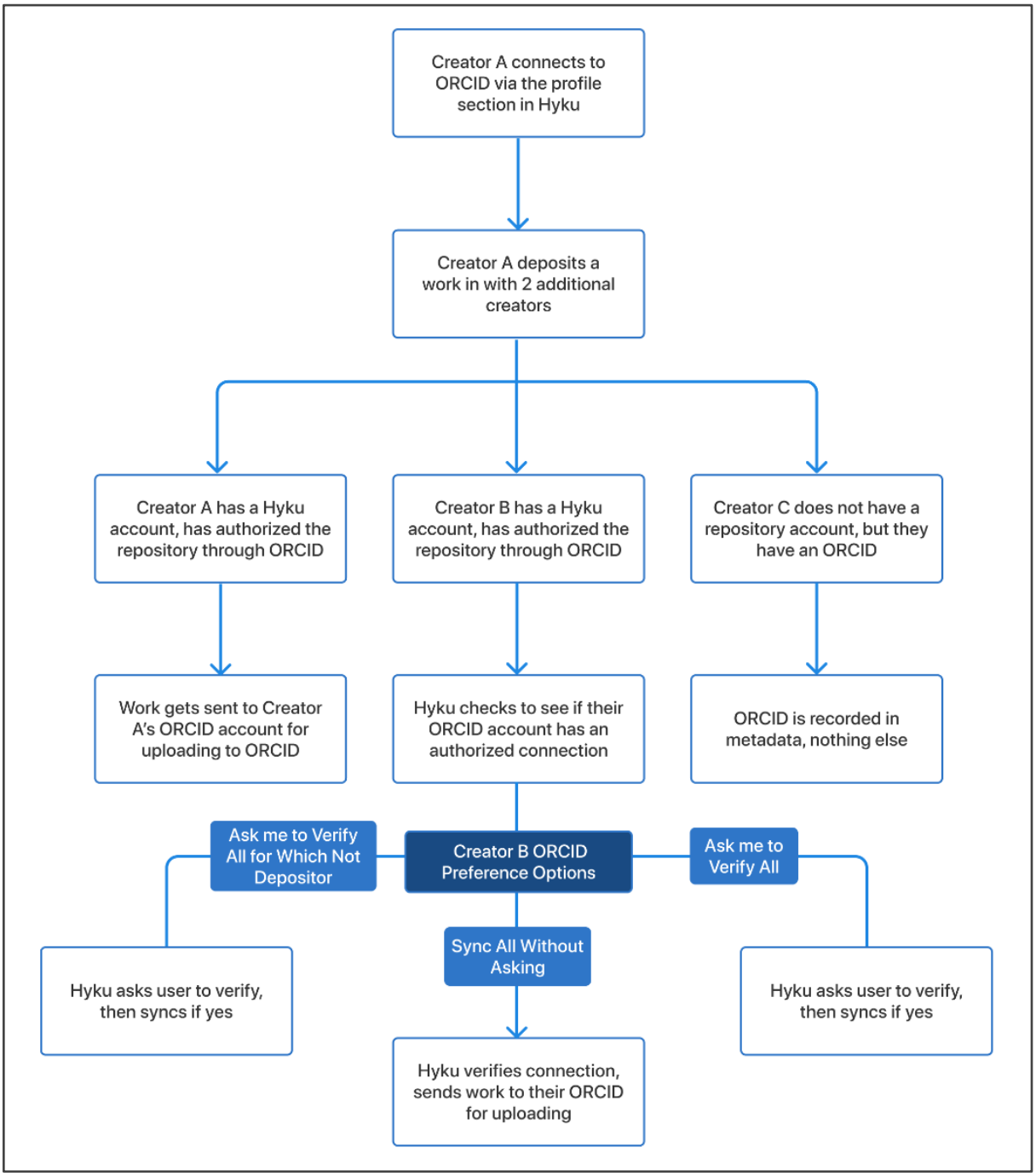
This work package enables repository users to synchronise their own works in the repository with their ORCID profiles by choosing from three settings (automatic synchronisation, synchronisation on a per-work basis, do not synchronise). Works listed with DOIs in the users' ORCID profiles can also be pulled into the repository through the DOI, thus achieving two-way synchronisation.

This feature is designed to further ensure the population of Hyku repositories, both by automatically collecting user content, and by encouraging users to manually deposit, in the knowledge that their work will also be efficiently added to their ORCID profiles.

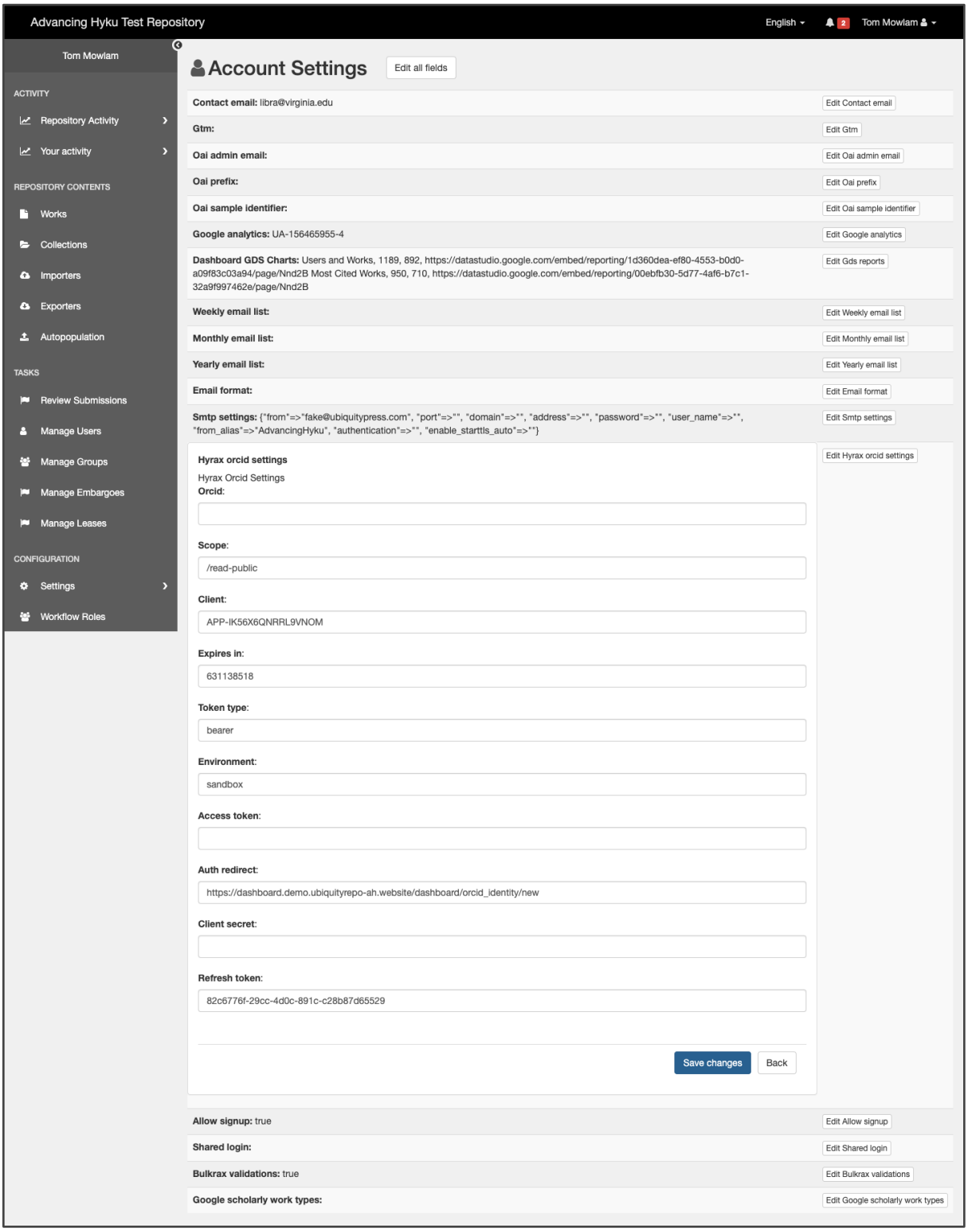
The full synchronisation workflow is demonstrated in this youtube video.



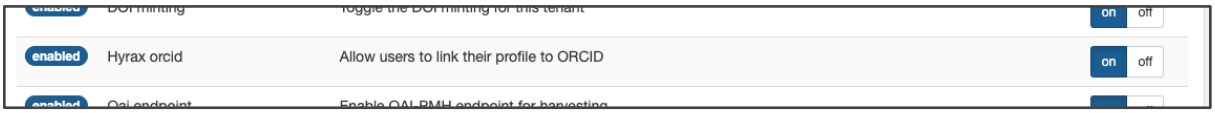
Synchronisation workflow



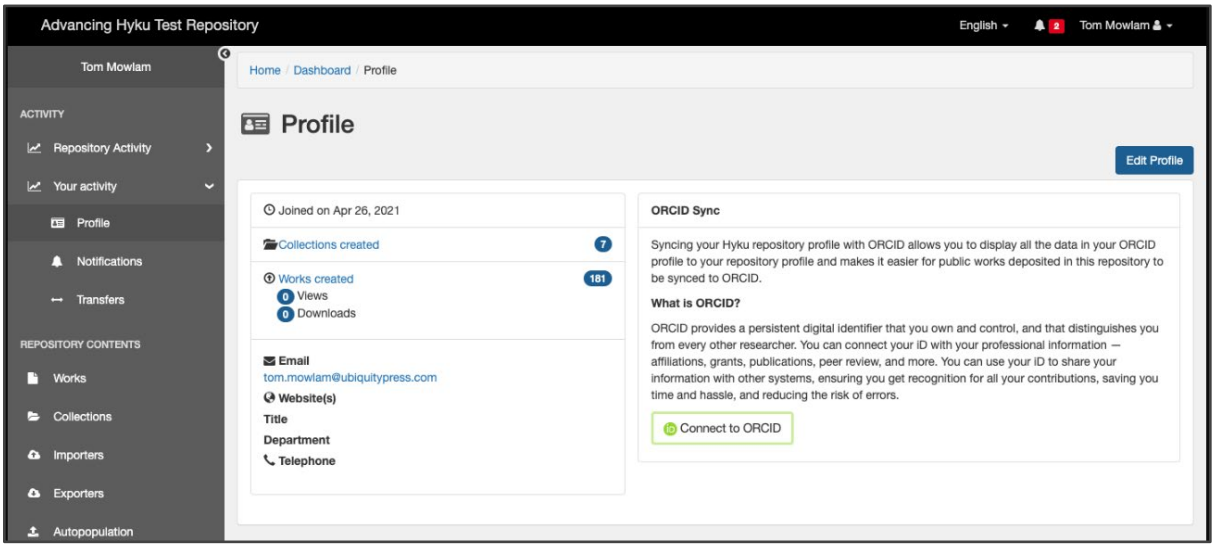
Work assignment to profiles for works with multiple creators



Additional ORCID API account settings added to the standard Hyku dashboard (some setting values removed in this screenshot, for security).



Feature switch added to the standard Hyku dashboard to enable/disable synchronisation interface.



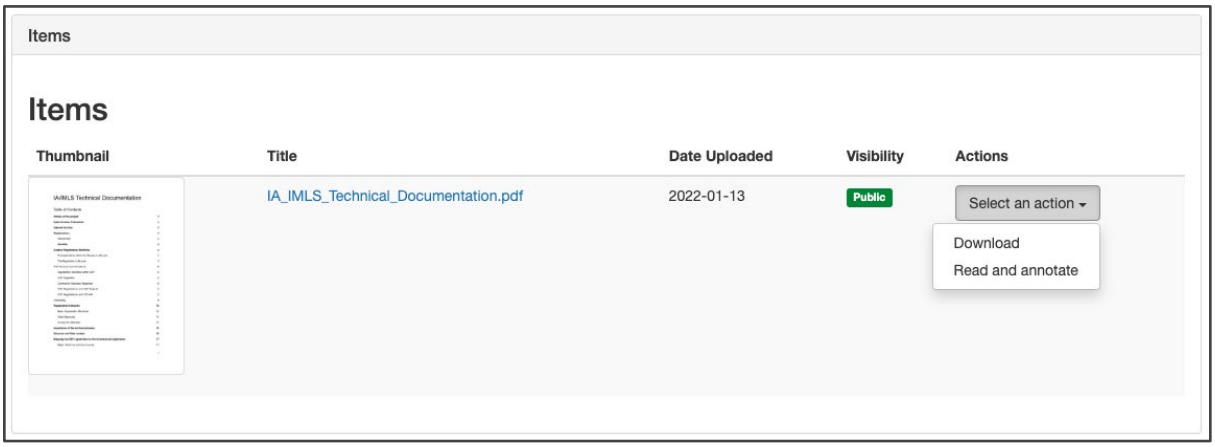
Standard Hyku profile page extended with ORCID connection settings.

WP4: Enable reading, commenting and annotating

This work package enables the reading, commenting and annotating of the full text of PDF works in Hyku repositories. PDF content is displayed in the browser, and can be annotated online using the Hypothesis service. Annotations can be shared publicly or within closed user groups.

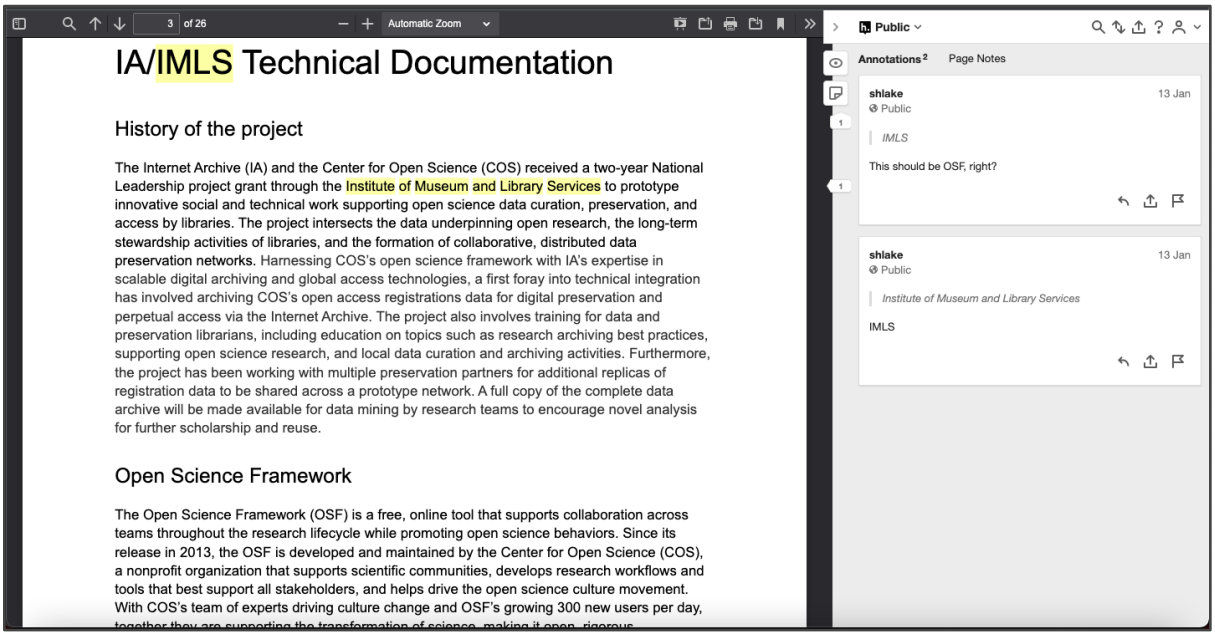
The feature makes it significantly easier for users to browse works in the repositories, and encourages the use and citation of works by enabling users to quickly annotate and comment on them. This also contributes to the professional appearance of the works in the repositories, further encouraging authors to deposit.

Feature switch added to the standard Hyku dashboard to enable/disable PDF annotation.



Portion of the standard Hyku work page, showing the additional 'Read and annotate' option for PDF files.

Portion of Ubiquity Press UI work page, showing additional 'Read and annotate' option for PDF files (as icon with hover-over tooltip).



PDF opened in-browser from the standard Hyku UI work page, with Hypothesis overlay showing two annotations.

Measures of uptake

The project has just completed and most existing Hyku repositories have not yet had time to assimilate the features contributed by it. As such it is not yet possible to meaningfully measure any increase in deposit to Hyku repositories. We can however provide some feedback from Ubiquity repositories, where the code has been adopted earlier on.

At the start of the project Ubiquity Press had 3,338 works with publicly accessible files on Hyku. By the end of the project this had increased to 22,622. 99% of the increase was from new customers joining the platform (with the majority of the customers joining from a non-open source platform).

Features in each of the work packages have been mentioned by customers as significant considerations in their move to the Hyku platform - for example one customer has registered 5,786 DOIs (5,593 of which are for works with publicly available files) with DataCite using the feature delivered during WP0, two customers have joined in a cross-tenant search (WP0), and a customer who joined at the end of the project is particularly interested in filling their repository using the auto-population feature delivered as part of WP1.

Appendix J: UVA Migration Analysis

Summary

The objective of the Advancing Hyku project's Work Package 8 was to migrate content from UVa's LibraOpen repository based on Sufia 7.3 (a legacy version of the Hydra Project - now Samvera) into the Hyku version developed by Advancing Hyku (the products of this grant). Results from this test demonstrate the steps needed to take existing content (metadata and files) from legacy repositories and ingest them in an "Advanced Hyku" repository.

Administrators are the target audience for this ingest procedure designed to be used at the beginning migration of works from a legacy repository. Once the works are migrated, users of the repository are expected to be able to edit and work with their content as well as add new content, all consistent with the description / metadata fields as in the older (legacy) repository.

Background

We want to point out that it is not trivial to customize the metadata schema in Hyku. The ability to create flexible metadata schema was not part of this grant. That work, development of Allinson Flex - on the fly user editable metadata schemas, is currently being worked on in the broad Samvera community and at the time of the work on this report, was not complete. Please see the recent report on this work at: https://samvera.atlassian.net/wiki/spaces/samvera/pages/504924720/Samvera+Connect+2020%3A+Workshops?search_id=cc96291b-019d-42c6-9555-aa7c29b6920c

Designs

For any migration, the first step is to set up comparable metadata in the Advanced Hyku repository, in order to migrate existing records (fields) and align the new repository with the look-n-feel for deposit requirements of the legacy system. The developers at Ubiquity Press manually created a UVa "work" type that matched UVa's current metadata schema, since the Hyrax feature - Allinson Flex is not yet out of development.

The UVA legacy repository tested is a self-deposit institutional repository and as such it is important to keep the metadata simple for self-deposit (non Librarians). The previous migration test for Advancing Hyku was the British Library's "Shared Research Repository," a digital collection repository where administrators/catalogers enter metadata. The differences in metadata requirements between the two types of repositories are significant, as noted below.

Preparation and Functional Specifications

Ubiquity Press Tasks

Ubiquity Press (UP) created a UVA-work type in April 2021 with metadata fields from UVa's original repository, based on functional specification provided by UVa for metadata mappings. Metadata specifications from UVa's Sufia 7.3 are located in the shared spreadsheet at

https://docs.google.com/spreadsheets/d/1QUEoYCMSdPOXxVpfsSuPQdhjzM_1HGcT/edit#gid=87254317

Once the new metadata schema was deployed to the system, UP created a corresponding bulkrax metadata template (CSV format). Using instructions from UP and Q&A with the developers, the UVa repository administrator populated this UVa-work type template with the corresponding values from UVa's repository records, including associated file names. Additionally, UP set up cloud server space to put the files to be migrated.

UVA Tasks

Metadata was extracted from UVa's open repository using a customized export feature from the legacy repository. The UVa repository administrator copied the content from this export and pasted it to the corresponding fields in the UVa Work type metadata template. This was not an easy task. The way the bulkrax import feature works is that if there are repeatable block fields, such as "creator", new columns must be added for each additional block. As the number of creators were different for each record, creating these new columns was not predictable and was done manually by the UVA repository admin.

For this test, the UVa repository administrator downloaded files from the corresponding records to be ingested (uploaded) and uploaded them to the cloud storage area provided by UP.

Once the spreadsheet with all the metadata content was complete and files uploaded to the cloud storage, the repository administrator logged into Hyku to create the bulk importer.

Conclusions

For proof of concept, UVa successfully imported 15 records and corresponding files. For a full migration, because of the need for adding columns per multiple fields blocks, the editing of the metadata spreadsheet will be very time consuming. As the UVa repository administrator, I used OpenRefine to populate author fields in the metadata template and corresponding files. As this was a small test of only 15 records, I did not use Ubiquity's migration services. Ubiquity regularly migrates repositories with thousands of records using OpenRefine, although it does take some time to set up the crosswalk for each repository. With OpenRefine, the data are converted from the source automatically and appropriate columns (e.g. for creators) are automatically generated. But even with automation, human proofing of the extracted data is needed. Each existing repository probably will have its own metadata schem which would require a unique metadata schema and crosswalk to be created in OpenRefine along with a unique csv template for bulk upload.

Steps to configure Hyku Importer with this Advancing Hyku Project

1. UP creates the work type - metadata schema in Hyku
2. Original Repository Admin - Exports the records from the original repository
3. Original Repository Admin - Exports files from the original repository
4. Original Repository Admin - Upload files to cloud storage (account permissions set up by UP)

5. Original Repository Admin or UP - Creates metadata template based on the work type (#1)
6. Original Repository Admin - Copy-Paste fields from export to metadata template
7. Original Repository Admin - Continue to update edit metadata template
8. Original Repository Admin - logs into Hyku and starts the import workflow