



Saint Peter's
UNIVERSITY

Theresa and Edward O'Toole Library



HYRAX: An open-source digital repository solution

Scott Kushner, Systems and Emerging Technologies Librarian

Daisy DeCoster, Library Director



Saint Peter's UNIVERSITY

- Private, Catholic, Jesuit
- Jersey City campus
- Liberal arts curriculum
- 2,500 Undergraduate students -- 800 Graduate students
- 88% NJ Residents
- Ranked third (lowest) among all of the public *and* private institutions in NJ for average student loan debt

Student Ethnicity

Hispanic/Latino -- 34%

Black or African American -- 30%

White or Caucasian -- 21%

Asian -- 8%

O'Toole Library staff

Library Director (1)

Jersey City Librarians (5)

Archivist (1)

Support staff (4)



To repository or not to repository . . .

Let's do it!



- Platform for student scholarship
- Platform for faculty scholarship
- Platform for archival materials (University history)
- Enhances library's role
- Enhances discovery (OCR, Google)
- Increases collaboration with other departments
- Meets our mission and connects with information literacy “knowledge practices”
- Potential for growth



Nope



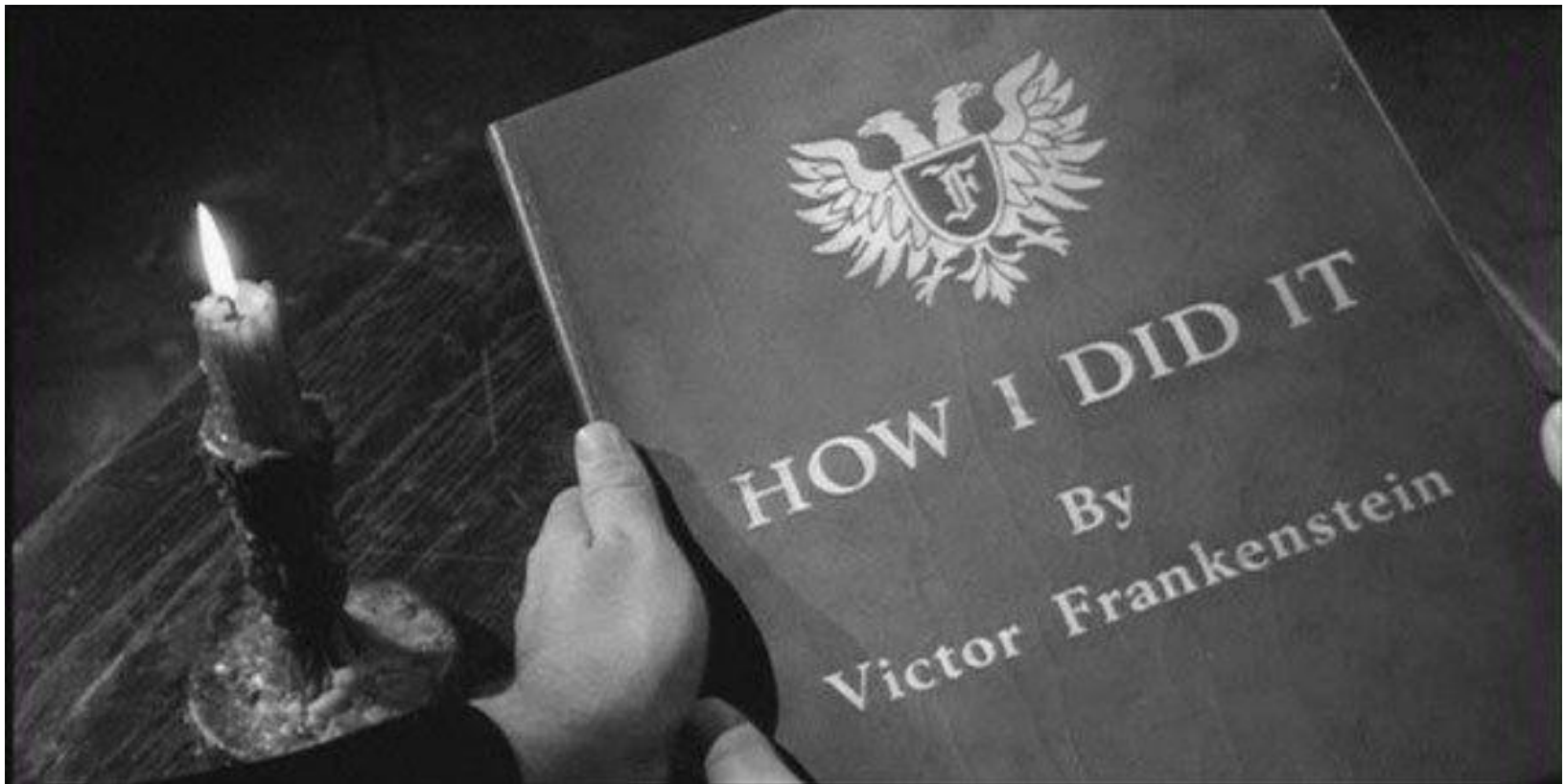
- Funding not available without cutting existing subscriptions
- **No dedicated staff**
- Faculty using other solutions (ResearchGate)
- ITS support is limited
- ILS might be a simpler solution for honors theses

Saint Peter's Repository Timeline

- **2010-2011 Planning and development of DSpace repository**
 - Systems librarian built DSpace repository
 - Reference librarian served as liaison with honors program, obtained permission forms and theses
 - Archivist contributed existing digital materials and metadata
- **2012 DSpace repository goes live**
 - some small archival collections included in addition to honors theses
- **2014 First doctoral dissertations included (EdD)**
- **2016 Research into new repository solutions**
 - Wishlist: Full-text searching (OCR), image gallery options, faculty researcher pages
- **2017 Project Request to ITS**
- **2018 Development of Hyrax repository**
 - student worker training, workflow planning, scanning
- **2019 Hyrax repository goes live ?!**

How I did it...

(But where to start...?)



Why Hyrax.. ?

- Open Source solution for our Digital Repository software (Java, Ruby on Rails, SQL db, etc)
- Many prestigious stakeholders already invested (Stanford, Cornell, Columbia, Yale, Princeton, etc..)
- It met our technological requirements:
- ability to archive digital items
- presentation layer to display items (Blacklight, Spotlight) strategy
- Full-Text Indexing: SOLR search engine and RSOLR gem.

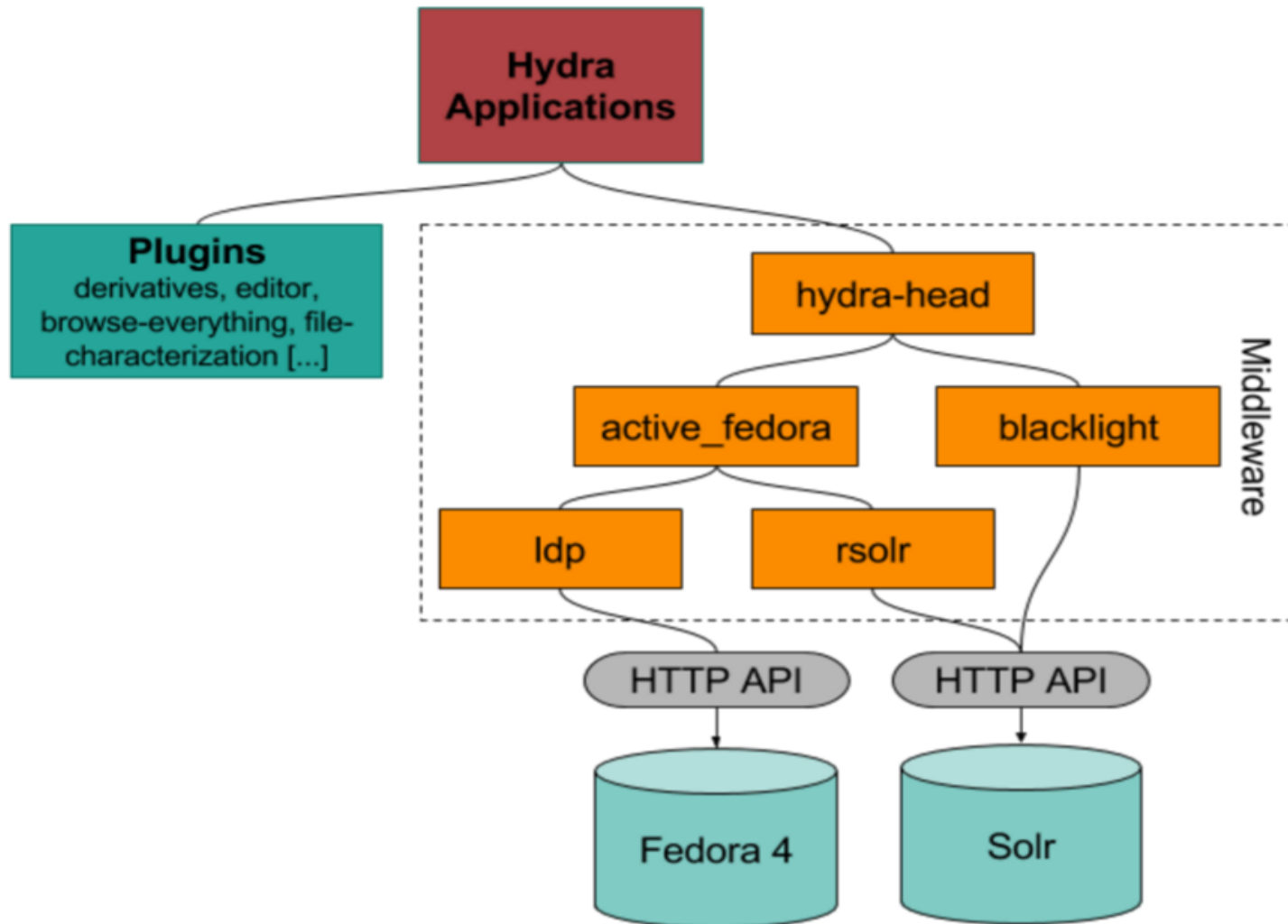
Where and how to implement...?

- Where will it live...? (Amazon Cloud, Heroku, our server at Saint Peter's?...somewhere else?)
- Made a pitch to IT for 2 Virtual Linux Servers on VMWare for Development
- Costs? Free? What...? (Yes there are free hosting services, each with caveats..Heroku, Amazon, etc have size, bandwidth, size, backup and restoration limitations, amongst other things.)

Hyrax requires the following software to work:

1. [Solr](#) version $\geq 5.x$ (tested up to 7.0.0)
2. [Fedora Commons](#) digital repository version $\geq 4.5.1$ (tested up to 4.7.5)
3. A SQL RDBMS (MySQL, PostgreSQL), though note that SQLite will be used by default if you're looking to get up and running quickly
4. [Redis](#), a key-value store
5. [ImageMagick](#) with JPEG-2000 support
6. [FITS](#) version 1.0.x (1.0.5 is known to be good, 1.1.0 is known to be bad: <https://github.com/harvard-lts/fits/issues/140>)
7. [LibreOffice](#)
8. [ffmpeg](#)

Actually, it's called, "Samvera"...



Technology Stack

Hyrax

If you are starting a new Samvera project, we strongly recommend you start with [Hyrax](#).

At the top of our architecture diagram is “Samvera Applications.” Broadly, these are [Ruby on Rails](#) based applications that follow Samvera conventions. While it is possible to create your own Samvera application by assembling the right components, and this has been a common practice in the Samvera community in the past, ongoing maintenance of home grown solutions will be more expensive than sharing maintenance costs with the rest of the community. We are in the process of focusing our community development efforts on Hyrax, and that will be the code base we are best able to support and maintain.

Fedora 4

We use [Fedora 4](#) as our persistence layer. This is where the actual content and its associated metadata (or pointers to them) are stored. Interaction with Fedora happens via an HTTP API. Fedora 4 stores content as linked data.

Solr

We use [Apache Solr](#) for our search. Content from Fedora is indexed into solr via [ActiveFedora](#), one of our middleware gems. Interaction with solr also happens via an HTTP API.

Middleware

hydra-head

[Hydra-Head](#) is a Ruby-on-Rails gem containing the core code for a web application using the full stack of samvera building blocks.

active_fedora

Ruby on Rails usually follows the [Active Record](#) pattern to persist objects to a database. We instead use [ActiveFedora](#) to persist objects to Fedora.

ldp

We use a ruby gem called [ldp](#) to implement the LDP ([Linked Data Platform](#)) interaction patterns for interaction with Fedora 4. You can read more about how we use LDP containers [here](#).

rsolr

[Rsolr](#) is a ruby client for solr. Handle Rails/Solr interactions with your app.

blacklight

Much of our search and display behavior is inherited from [Blacklight](#). Many Samvera institutions also run Blacklight applications separately from Samvera, to provide search and discovery for their collections. The Blacklight Project also has many of its own plugins, such as [Spotlight](#), for building virtual exhibits, and [GeoBlacklight](#), which enhances Blacklight for use with geospatial data

.Plugins

derivatives

A gem to create [derivatives](#) for uploaded content. This might include, for example, generating thumbnails for large images, down-sampled audio and video for web steaming, or thumbnail snapshots of PDF documents.

editor

[Hydra-editor](#) is a basic editor for samvera objects.

browse-everything

[Browse-everything](#) is a rails engine providing access to files in cloud storage. Currently there are drivers implemented for Dropbox, Skydrive, Google Drive, Box, and a server-side directory share.

file-characterization

[hydra-file_characterization](#) uses [fits](#) to characterize files and extract metadata about them. It might tell you what kind of image encoding an image uses, along with it's height and width for example.

Hyrax Homepage

Browser tabs: Inbox (3,665) - skushner@... x BLACKLIGHT x Deploying a Ruby app on... x Hydra - Google Slides x Saint Peter's University - Co... x Saint Peter's University x Saint Peter's University Dig... x

Address bar: Not secure | 172.17.8.211/#featured_container

Navigation bar: Apps Alma Production Log Saint Peters Universi Duke Digital Reposi PH Programmers Heave Configuration - App Saint Peter's Universi vSphere Web Client Open Invitation | Lib Building Web Apps Make WordPress Acc

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Depositor: skushner@saintpeters.edu
Keywords: Micro-plasma, Applied Physics
-  Atmospheric pressure cold plasma as an anti-fungal therapy
Depositor: skushner@saintpeters.edu
Keywords: Applied Physics

Explore Collections:

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-  Doctoral Dissertations
-  The Pavan
-  Faculty Publications

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3:52 PM 1/2/2019

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- Cold plasma therapy of a tooth root canal infected with *Enterococcus faecalis* biofilms in vitro**
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Depositor: skushner@saintpeters.edu
Keywords: Micro-plasma, Applied Physics
- Atmospheric pressure cold plasma as an anti-fungal therapy**
Depositor: skushner@saintpeters.edu
Keywords: Applied Physics

Featured Researcher:

Dr. Wei-Dong Zhu, Ph. D.
Director

Dr. Wei-Dong Zhu earned his B.S. in Physics/Education and M.E. in Material Science and Engineering from Soochow University in Suzhou China in 1998 and 2001, respectively and his Ph. D. in Physics from Stevens Institute of Technology in Hoboken, NJ in 2005. His doctoral research involves pulsed DC magnetron plasma reactive sputtering and plasma diagnostics. From 2005 to 2007, Dr. Zhu held a position as a Post Doctoral Research Associate at the Frank Reidy Research Center for Bioelectrics at Old Dominion University in Norfolk, VA and at the Department of Physics and Engineering Physics at Stevens Institute of Technology. During his postdoctoral position, Dr. Zhu worked on microhollow cathode discharges (MHCD) and cathode boundary layer discharges (CBLD) for excimer light source application. Dr. Zhu joined the Department of Applied Science and Technology at Saint Peter's University as an assistant professor of physics since 2007. Early 2009, the **Center for Microplasma Science and Technology (CMST)** was established at Saint Peter's University and Dr. Zhu was appointed as the Director of Research of CMST. In the professional community, Dr. Zhu has authored more than ten

Blacklight Search with Facets...

Browser tabs: Inbox (3,665) - skushner@... x BLACKLIGHT x Deploying a Ruby app on... x Hydra - Google Slides x Saint Peter's University - C... x Saint Peter's University x Index Catalog // Saint Peter's University

Address bar: Not secure | 172.17.8.211/catalog?locale=en&q=Pauw+Wow&search_field=all_fields&utf8=✓&view=masonry

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Saint Peter's University Digital Repository English 5 skushner@saintpeters.edu

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Filtering by: Pauw Wow [X] Start Over

« Previous | 1 - 10 of 54 | Next » Sort by relevance 10 per page [List] [Grid] [Grid] [Grid]

Type

- Pauw Wow 49
- Saint Peters History 3
- Collection 1
- The Pavan 1

Resource type

- Other 45
- Book 2
- Journal 2

Creator

- Saint Peter's University 50
- Cronin, Richard J., S.J. 2
- Various 1

Contributor

- Printing and technical assistance by Peacock Communications, North Arlington, N.J. 1

Keyword

Grid of search results (6 items):

- PAUW WOW the class of 1976 Graduation Ceremony Today Honorary Degrees to Wilkins, Aldrin Two Coeds Share Top Honors Alumni-To-Be Attend Baccalaureate Mass
- PAUW WOW the class of 1976 Graduation Ceremony Today Honorary Degrees to Wilkins, Aldrin Two Coeds Share Top Honors Alumni-To-Be Attend Baccalaureate Mass
- WE'RE IN! PAUW WOW Nephew's Voting Marked By Heavy Turnout At Polls Junior Balloting Light, Senate Elections Today Department Chairmen Elected City Study Fund Letter Letter From Signs No To Alton
- PAUW WOW Graduation Special Honorary Degrees to Buckley, Lombardi Alumni-To-Be Attend Baccalaureate Mass
- PAUW WOW ROTC Paves AIG Will Play Colors Honorary Degrees to Buckley, Lombardi
- PAUW WOW Young Teachers First In Controversy Tuition And Bill Needs Only Higher Signature Inner-City Center To Aid Downtown

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Feature by Collection Type

Inbox (3,664) - skushn... x Enhancing Resource L... x BLACKLIGHT x Deploying a Ruby app... x Hydra - Google Slides x Saint Peter's University x Saint Peter's University x The Pavan // Saint Pet... x

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The Pavan

User Collection Public

10 Items • Last Updated: 2018-10-25


Saint Peter's University magazine of creative student works...

Collection Details	
Total items	10
Size	79.9 MB

Search subcollections and works in this collection

Go

Works (10)



Navigation icons: list, grid, compare, share

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172.17.8.212/spotlight/saint-peter-s-university-athletics/catalog?q=Men%27s+Basketball&search_field=all_fields&utf8=%25D7&view=gallery

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Men's Basketball

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Attribution:
Saint Peter's University Archives

Date:
1968

Basketball Inaugural Team 1930

Bookmark

Description:
Men's basketball

Attribution:
Saint Peter's University Archives

Date:
1930-31

Happy Peacocks with Coach Kennedy..

Bookmark

Description:
Men's Basketball

Attribution:
Peacock Pie p.225

Date:
1954

Issues...challenges..?

Due to its extensive list of [dependencies](#), Samvera is difficult for smaller institutions to implement*

*Wikipedia

- Issues with RVM, had to use RBENV Ruby installer and Rails..
- Issues with Exec.js, therubyracer, and Rails 5.
- Nodejs installation., Yarn, etc..
- Hyrax has no frontend UI development feature (This is a Ruby on Rails thing...css and the asset pipeline, webpacker, nodejs, other stuff....)
- Better documentation (recipes) would make Hyrax easier to implement.
- Bugs and version conflicts...yes, unfortunately, even in Open Source software, there are bugs (not just in Microsoft..the good news is that they get “fixed” much faster..)
- Issues with Development vs. Production installations (web server -- Apache or NGINX, app server -- Phusion Passenger, and Capistrano...)

HELP!!!

Where to get
it..

Community

[Samvera](#)

[Samvera-Tech Google Group](#)

[Hyrax Github installation instruction](#)

[Hyrax Development installation
instructions](#)

[Project Blacklight Spotlight Wiki](#)

[Contributing to Spotlight Wiki](#)

[Open Source Community for Samvera](#)

Future Developments

- **Valkyrie..** Valkyrie is a gem which uses the Data Mapper pattern (https://en.wikipedia.org/wiki/Data_mapper_pattern) to abstract out interaction with metadata and file storage backends, restricted to the use cases of a digital repository. The goal is to enable institutions to share front-end or middleware code, but still make a choice that matches their institution's needs around where to store their metadata and files on the backend.
- Solr search result set text in context rather than just PDF attachment
- [Hyrax Roadmap](#)

The Hyrax IS cool...!

Why?

Close cousin to the Elephant!

Has tusks like the Elephant!



Looks like a Vampire!



THANK YOU, VALE MEMBERS!

Questions?

Comments?

Suggestions?

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Daisy DeCoster -- ddecoster@saintpeters.edu, @daisydecoster