

Library IT Unit Annual Report FY20

Date: September 29, 2020

Director: Tracy Tolliver

Unit Narrative

Major Activities and Accomplishments

Major activities and accomplishments will be of two flavors. Many tasks and activities for Library IT are operational in nature, meaning they are necessary to maintain operational excellence for the Library, while other activities are more project oriented, and often can be more closely tied to specific initiatives, goals, or funding. The last quarter of FY20, as well as the first quarter of FY21, saw significant operational activity around the response to COVID19. The following list is by no means exhaustive but does represent the major activities and accomplishments for FY20.

Operational Activities and Accomplishments

1. Help Desk (HD)/Workstation Network Support (WNS) resolved or routed **2384 OTRS tickets** during FY20, 111 more than last year. These tickets vary in scope from simple hardware/software troubleshooting to new equipment and service requests.
2. HD processed **151 equipment loans**.
3. WNS replaced Library faculty, staff, and public access workstations as part of the normal hardware refresh.
4. HD/WNS continued the Library's Computer Technology Allocation Program (CTAP) by researching and recommending hardware standards, purchasing and configuring new products for the CTAP demo pool, meeting with clients to determine best hardware fit, and **processing 39 CTAP requests** for FY20, 10 fewer than last year due to COVID.
5. HD/WNS completed the migration from **Windows 7 to Windows 10** for Library workstations and laptops.
6. HD/WNS/Infrastructure Management and Support (IMS) completed implementation of the cloud hosted campus service, **Crash Plan**, for endpoint backups, retiring local hardware.
7. HD/WNS completed implementation of **CrowdStrike** to over 90% of Library's endpoints, well ahead of most campus units, supporting campus security initiatives.
8. IMS began migration from Puppet to **Ansible** for serverless configuration management, targeted to be complete Fall 2020.
9. IMS successfully **resolved 251 OTRS tickets** and **responded to 5 Idea Forms** (see Appendix A).
10. IMS also implemented several security improvements that place the Library as a campus leader in complying with University Information Security Standards, as proven by the last annual assessment.
11. Web Services Team **trained 84 people** on WordPress during FY20.
12. Web Services Team **migrated 15 sites** from sidecar to cPanel, taking advantage of the campus hosted cPanel service to reduce cost for the Library and to leverage automated patching of the WordPress stack for these custom websites.

13. Scholarly Communications and Repository Services (SCaRS) automated much of the operational workload in the Collection Registry upon Howard Ding's departure to improve ingest processing, reduce developer intervention, and provide better error messaging to patrons to allow self-support.
14. SCaRS upgraded the Illinois Data Bank to use the most recent versions of the Rails libraries and version 4 of the bootstrap interface library.
15. SCaRS also upgraded the applications that make up the IOPN infrastructure once Alex Dryden onboarded, which was desperately needed after Chris Madden departed, and the applications were orphaned for some time.
16. Library IT continued developing service life cycle capabilities including completion of a service catalog application for tracking services and their associated attributes.

COVID19 Response Activities and Accomplishments (a few of these cross over into FY21)

1. HD/WNS successfully reclaimed, prepped, and checked out over 50 laptops within a week to provide devices for working remotely during the pandemic.
2. HD administered expansions to Springshare LibApps services to support library services by appointment only, reserved study spaces, and technology loans.
3. HD expanded support to include library faculty's and staff's personally owned devices, to which we have less control and access, in order to facilitate remote work during the pandemic.
4. HD created online guide for library staff covering resources and technology for working remotely.
5. WNS facilitated wireless network implementation in the UGL plaza space to support the move of their "circulation" desk.
6. WNS facilitated network connectivity and computer equipment for the Marshall Gallery locker fulfillment service point.
7. WNS facilitated reconfiguration and equipment for Main Library 106 and 109 in support of multiple consultation spaces to be used for by appointment services.
8. WNS facilitated the redirection and installation of the Room 220 Project Bookeye Scanner to Room 413 to support the new Digital Fulfillment workflow.
9. WNS facilitated additional scanners for Archives and RBML to support increased needs to digitize content for patron requests within their units.
10. Jim Dohle, Eric Kurt (Media Commons), and WNS identified use cases, evaluated equipment, and finally procured items to build "instructional equipment kits" geared towards special collections needs around online instruction, engagement, and outreach. This was not easy as items went in and out of stock from various vendors, and Kodak's website was taken down for over 2 weeks by a ransomware attack when we needed to download the webcam software.
11. Jay Heldreth from the Web Services Team updated Primo to accommodate the HathiTrust ETAS requirements.
12. Alex Dolski from the SCaRS team added enhanced permissions functionality to the Digital Library to support the delivery of digitized content to patrons, while also meeting copyright and HathiTrust ETAS requirements.

13. Web Services Team supported content updates related to COVID messaging and communication, including new pages and an updated Libraries and Hours layout.
14. Library IT staff participated on several campus and library groups created specifically to help craft and implement response measures to the pandemic.
 - a. Campus IT Council – COVID19 Campus IT Response Team
 - b. Library’s Digital Fulfillment Implementation Group
 - c. Campus Virtual Desktop Infrastructure Working Group
 - d. Campus Technology Loaner Program point of contact for unit

Project Activities and Accomplishments

1. A number of activities were completed in support of the migration to Alma, which occurred on June 24, 2020.
 - a. Megean prepared systems and staff permissions for the migration.
 - b. Library IT identified, prioritized, and implemented system integrations to be addressed in the migration, such as patron loads, financial feeds, printing, and preservation processes. (still some ongoing work here)
 - c. The Web Services Team handled most heavy lifting for updating SFX links for databases and journals across the Library’s web real estate and LibGuides. (~34,000 in all)
 - d. Jay Heldreth supported much of the Primo setup and configuration, while Helen Zhou provided accessibility review feedback.
2. WNS completed the installation of new technology for the Main Library First Floor Service Point.
3. WNS purchased and installed equipment for Grainger Commons technology refresh.
4. WNS purchased equipment for Main Library Room 220 renovation project. Installation pending construction activities which were delayed by COVID19.
5. IMS retired the Tier 2 Storage array, which involved working with multiple units to review backlogged content for ingest into appropriate destinations, defining improved workflows, and implementing replacement virtual infrastructure meeting performance and storage needs.
6. The Web Service Team completed the following work:
 - a. Redesigned Building Project Website – waiting for production launch approval.
 - b. Launched redesigned Gateway page with restructured navigation menu for entire site.
 - c. Launched redesigned Libraries and Hours page.
 - d. Introduced new Library Technology tab.
 - e. Launched Illinois Newspaper Project site.
 - f. Launched redesigned SLCA site.
 - g. Developed new Preservation Services site, unit currently working on content.
 - h. Built Email Archives Grant project website.
7. SCaRS made significant progress on the IDEALS rebuild project. The demo application is available with many features implemented, including user authentication and authorization, a revamped site structure based on academic unit, improved item discovery, item display, handle server integration, and a medusa repository foundation.
8. Staging versions of the upgraded Vireo Thesis and Dissertation Deposit System are setup for the

Graduate College and the undergraduate thesis deposit team to review.

9. SCaRS developed a new feature for Omeka-s that more cleanly separates exhibit assets between different users, allowing for delegated controls to support multiple units using the same environment.
10. SCaRS and IMS continued to implement cost control measures in AWS to manage the monthly costs of the infrastructure under Medusa and related applications. The original cost projected for FY20 shortly after migrating to AWS was \$101,536, we ended the year at \$79,830, a **savings of \$21,706 realized in AWS for the year**. This actual cost even included additional build out for the IDEALS project and Globus. For comparison, we estimated that the highly subsidized campus compute and storage costs for the same infrastructure would have been approximately \$85,000 and purchasing our own hardware would have been roughly \$150,000 per year (\$750,000 up front outlay, amortized over 5 years), providing little flexibility for future needs.
11. Discussions around a digital repository for CARLI members is gaining traction. As of the end of FY20 three infrastructure models have been generated for discussion. Costs are currently being estimated for each of the three models.

Major Challenges

Staffing

As stated in the FY19 annual report, staffing is a challenge in Library IT. We have continued to improve the staffing in Library IT over the past year against the staffing proposal shared with Library leadership last summer and fall. Fortunately, we only had 2 new departures during FY20. We now have Web Services staffed at adequate levels. We were able to onboard a Visiting Research Programmer in SCaRS to support the IOPN services in August 2019. Another search is underway for an opening in SCaRS, which will round out that group under their current workload. The next priorities for hiring efforts are an Application Integration Developer in IMS to work alongside Jon Gorman in supporting the many legacy applications and new Alma integrations, and a Systems Analyst to work alongside Megean Osuchowski to move forward our service life cycle efforts, to provide additional bandwidth for application administration, and to facilitate stakeholder involvement in development/IT projects. Both of these approved positions were put on hold in March when the pandemic struck. Due to the pandemic, we have had a fundamental shift in our equipment footprint, an increased amount of AV equipment to support, and no print revenue to support new student employees. These factors together are driving a need for an additional IT Specialist for WNS. As the FY21 budget becomes more clear, prioritization of these positions will be pursued if possible.

Staffing shortages lead to issues balancing daily trouble tickets and operational work with project or planned work due to the lack of bandwidth. The same applies to the ability to complete professional development and staff training while maintaining high levels of service.

Efforts to improve staffing and retention will be ongoing in FY21. Library IT will also spend significant effort in creating job descriptions, promotional levels, and compensation ranges to adapt to the reclassification of campus IT staff as we pursue filling positions. Tracy Tolliver served on the campus IT

Job Families Committee over the summer to move some of this work forward on campus so that it can be leveraged at the Library.

Growing Equipment Footprint

With the adoption and implementation of the Computer and Technology Allocation Program (CTAP) and the implementation of detailed inventory and tracking, Library IT and the Library are positioned well to evaluate and analyze the distribution of various types of equipment across the Library. The current equipment inventory has outgrown the current Library IT budget allocation; the budget does not support the proper maintenance and refresh cycles required to keep all the currently deployed equipment in good repair and maintenance, let alone adding any new equipment. The pandemic response has exacerbated this problem. With building project planning underway, a good companion activity will be to evaluate need for various types of equipment (desktops, laptops, scanners, printers, AV, etc.). The Library can make intentional decisions about what is needed so that proper budgeting can be aligned.

Evolution from a Capital Expenditure Model to an Operational Expenditure Model

Library budgeting and practices need to adapt as infrastructure such as compute and storage resources move to cloud services. No longer will large sums of money be sunk into hardware every 5-6 years; use of these resources will be on a pay-as-you-go model. So, for example, instead of spending \$500,000 on a large storage array and servers to last for 5 years in year 1, and paying nothing in years 2-5, one will pay \$100,000 each year to use those resources. The \$100,000 now needs to be allocated to the recurring/operational budget. We are seeing this impact with moving Medusa, Illinois Databank, and Digital Library to Amazon Web Services.

Moving to these services affords a lot of advantages to the Library's ability to be agile. Resources can be provisioned almost instantaneously, many services are available in these environments to make work easier, and less lower-level administration is needed to maintain the environments if they are setup to take advantage of available features. In the long run, if these services are used how they are intended to be used, they will also cost less when comparing apples to apples, as we have proven during FY20.

One main gap recognized in this model is the ability for unfunded research or projects to use excess capacity. Library IT will need to work with Library leadership to determine how best to support this need.

Emerging Technologies

Finally, staying abreast of emerging technologies and how they might be implemented in the Library is an ongoing challenge for all. Library IT is getting requests for more technology in collaborative spaces. Library IT has experienced a considerable increase in requests for VR technology, which forces the development of new hardware standards and configurations. Larger and larger data sets and files stretch conventional architectures and applications. The pace of technological change is only going to increase.

Significant Changes to Unit Operations

COVID 19

Library IT began remote operations due to the pandemic on April 1, 2020. While the outputs of SCaRS, Web Services, and IMS have been largely unaffected by this arrangement. Help Desk and WNS staff have had to learn how to best provide remote support with the same level of quality. They have also had to shift from providing primarily desktop support on site to providing laptop support in remote work settings. The laptop footprint has grown significantly from this time last year. Not only does this increase the funds needed to procure, maintain, and refresh an individual's workstation device, it also increases support time needed. The volume and use of AV equipment to facilitate online instruction, outreach, and engagement has also increased, requiring additional support time.

With the Library spaces primarily closed to the public, printing revenues used to fund our student workers, public and staff printers, and some student staff in UGL/Media Commons has evaporated. We have eliminated funding to UGL/Media Commons for student employees, not purchased any printers or supplies, and only hired back previously employed students in Library IT on funds we have remaining for this semester/year. We will need to analyze this and determine how to move forward.

AWS/MS Azure/Google Cloud Platform/Other Virtualized Platforms

Library IT is pursuing a Cloud First strategy, meaning that services will be sourced as high on the technology stack as possible to reduce the need to maintain hardware, update firmware and operating systems, perform component and application patching, etc. Moving to use cloud resources requires a complete retraining of staff, from the platforms themselves, to the tools used to manage the compute and storage resources, to the approach for architecture. This move to new infrastructure also allows for a move to a more integrated technology stack, prompting the consideration of combining system administration functions and general software development functions into a single team in order to optimize on this technology and to provide the best possible solutions to the Library. As of January 2020, IMS retired all remaining physical hardware housed in Library spaces. All infrastructure is now hosted either by campus or third-party cloud providers.

Contributions to Library-wide Programs

Library IT provides technology expertise and foundational technologies such as networking, compute and storage resources, web and application development, workstations, and other technology services that play some part in almost every Library-wide program. Some specific examples are provided.

1. Partnered with Staff Development and Training Committee and ILS Migration Team to premier first library-wide Zoom livestream and recording from Main Library Room 106. This system was funded and implemented based on the proposal made last fiscal year.
2. Helped Staff Development and Training Committee setup private Media Space channel for Library employees to watch recorded training sessions. The Media Space platform will help the committee track interest and viewing data on recordings.
3. Web Services Team (Dan Dalpiaz) worked with Mark Zulauf, Illinois Experts service owner, to develop and implement an ORCID application to facilitate campus researcher use of ORCID's and

to connect the IDs to our campus directory records, making them available to other campus/unit applications, and providing a quick reference for researchers. <https://orcid.library.illinois.edu/> .

4. IMS worked closely with preservation services and the vendor to expand and update the Veridian application that houses digitized newspapers. This will help facilitate the ongoing project with newspapers.com to digitize much of our newspaper collection.
5. Worked with Grainger/IDEA Lab, UGL/Media Commons, and Scholarly Commons to create and secure Library Strategic Funding proposal for a 2-year Machine Learning and Artificial Intelligence project (\$20,000). Tracy Tolliver also secured gap funding of \$7,500 from AWS to help with costs for compute resources needed.
6. Worked with Grainger/IDEA Lab to create and secure Library Strategic Funding proposal for a 3D Scanning project (\$18,510).
7. Helen Zhou and Megean Osuchowski hosted an iSchool practicum student during the pandemic to allow him to get experience in an IT field. They trained him on some digital accessibility review practices and had him apply those skills to a review of library.illinois.edu, producing a report on his findings as his deliverable.
8. IMS provided support to Oak Street for evaluation and testing of the new CaiaSoft inventory software service during FY20. The eventual implementation of this service to replace the existing, aging inventory service will allow much improved interfaces and workflows for the Oak Street collections.
9. Multiple Library IT staff participated on project teams for the Main Library building project and the Room 220 Exploratory Committee.
10. Multiple Library IT staff participated on the project teams for the ILS Migration.
11. Library IT staff also served on a number of other Library committees through FY20 including CAPT and all but one of its sub committees, Staff Development and Training, Academic Professional Promotion Review Committee, Awards and Recognition Committee, and Administrative Council.
12. IMS supported a number of applications that are used throughout the Library for workflows critical to daily work and long term efforts such as Oak Street and Stacks transfer applications, preservation tracking of digital and physical assets, staff vacation and sick leave reporting, building key inventory, scholarly communications and publishing's environments, and the digital repository (Medusa) with all of its related applications.

Progress on FY20 Goals

See Appendix B for full list. Many items are duplicative of Major Activities and Accomplishments.

FY21 Unit Goals

These are the Library IT Unit Goals and Priorities compiled by Tracy Tolliver for FY21. They are a slightly updated version of the FY20 Goals.

General Operational Excellence to support Daily Library Needs

Customer Service

Communication

Transparency

Mature Service Life Cycle process

ILS Migration to Alma/Primo

While the migration was completed and the Library went live with the new system on June 24, 2020, there is still outstanding work to be done related to integrations and improving workflows. Two staff members will continue to spend significant time supporting the new system during FY21.

Library Website

The Library Website is our virtual space visited by our patrons. Our online or virtual space is extremely important to the image of the Library.

Library IT will support the efforts lead by John Laskowski (User Experience) and Bill Mischo (Search and Discovery) to continue to enhance and improve our discovery and delivery environment for our patrons.

Upgrade web infrastructure for WordPress during 2020 also.

Educate Library faculty and staff about components of IAM, such as federated authentication and SAML, and promote implementation for e-resources

Along with enhancing and improving our own virtual presence, Library IT will facilitate a better user experience around e-resources through the promotion of federated authentication. The default configuration for e-resource setup is IP based access and EZ-Proxy. IP based access is not sustainable, and EZ-Proxy does not always allow for a seamless user experience. Federated authentication, along with publishers implementing Seamless Access at the discovery layer, would provide for a more friendly user experience.

Enhance accessibility expertise, make sure our virtual presence fully supports all users, and we can provide accessibility expertise to library

The team made good progress on building accessibility expertise and offered 3rd party assessments of custom developed products beginning in 2019. The team will continue to build out this expertise and apply to library use cases.

Scholarly Communications and Repository Services Infrastructure Updates

IDEALS to AWS - The team will rewrite IDEALS to run in the AWS environment, and continue to improve the architecture of all repository related applications to take advantage of the AWS infrastructure and to optimize costs.

Upgrade Vireo – Electronic Thesis and Dissertation Management System used by the Graduate College to facilitate thesis and dissertation review and to support the graduate degree granting process.

Support SCP efforts – Spencer Keralis is creating new exhibits and migrating existing exhibits to a reduced number of omeka platforms.

Digital Repository expansion to support CARLI members

While this expansion will likely not happen during 2020, foundational work and planning with Preservation Services will begin to address the considerations around scaling this offering out to the CARLI community.

Help Library make meaningful decisions based on data

Data analytics to support telling the Library story

Support collection analysis for various efforts (building project, digitization, etc.)

Business / HR data support

Support Campus Security and Privacy Initiatives

Campus is investing a substantial amount of money into an overall security and privacy effort for campus over a 5 year span. Library IT will continue to align with and support these efforts.

Library Emerging and Advanced Technology

Focus on enabling virtual access to library advanced and emerging technology resources, including hardware (advanced workstations with GPU's), software, virtual machines, etc.

Supporting shift in paradigm of the physical experiences (audio/video studios, advanced loanable tech, etc) given the new and ongoing challenges with in-person interactions, including changing rules, types of equipment and engagements, amount of equipment, use of equipment, etc.

(reach) Provide support for ongoing and new challenges with supporting both synchronous and asynchronous Library advanced and emerging tech.

Library Capital Building Projects – IT input/support

With Conceptual Design for the 2 big capital projects wrapped up in 2019, we will participate in the Programming phase in 2020, primarily focusing on the Special Collections Center.

Library IT will also participate in various other facilities projects throughout the year to inform and provide the IT components in those projects: Rm 200, Rm 220, Grainger IDEA Lab renovation, ACES/Funk Staff Offices, Altgeld, ...

Professional Development of Staff

Management and Leadership training – select staff

Agile training – anyone interested

Accessibility training – web team and software development staff

AWS / related technical training (AWS, Terraform, Containers, Continuous Integration/Deployment tools, etc.) – IMS staff and software developers

MS Azure / related technical training – IMS staff and software developers

Career Paths for Staff

Work with campus to develop job families.

Create job descriptions for Library IT positions, including levels to support promotional opportunities, to support transition to Civil Service Professional Exempt classifications.

Unit Needs to Support Goals and Mission

Library IT primarily needs to address staffing and provide for appropriate training and professional development to allow for staff to support the Goals outlined here and the Mission of the Library.

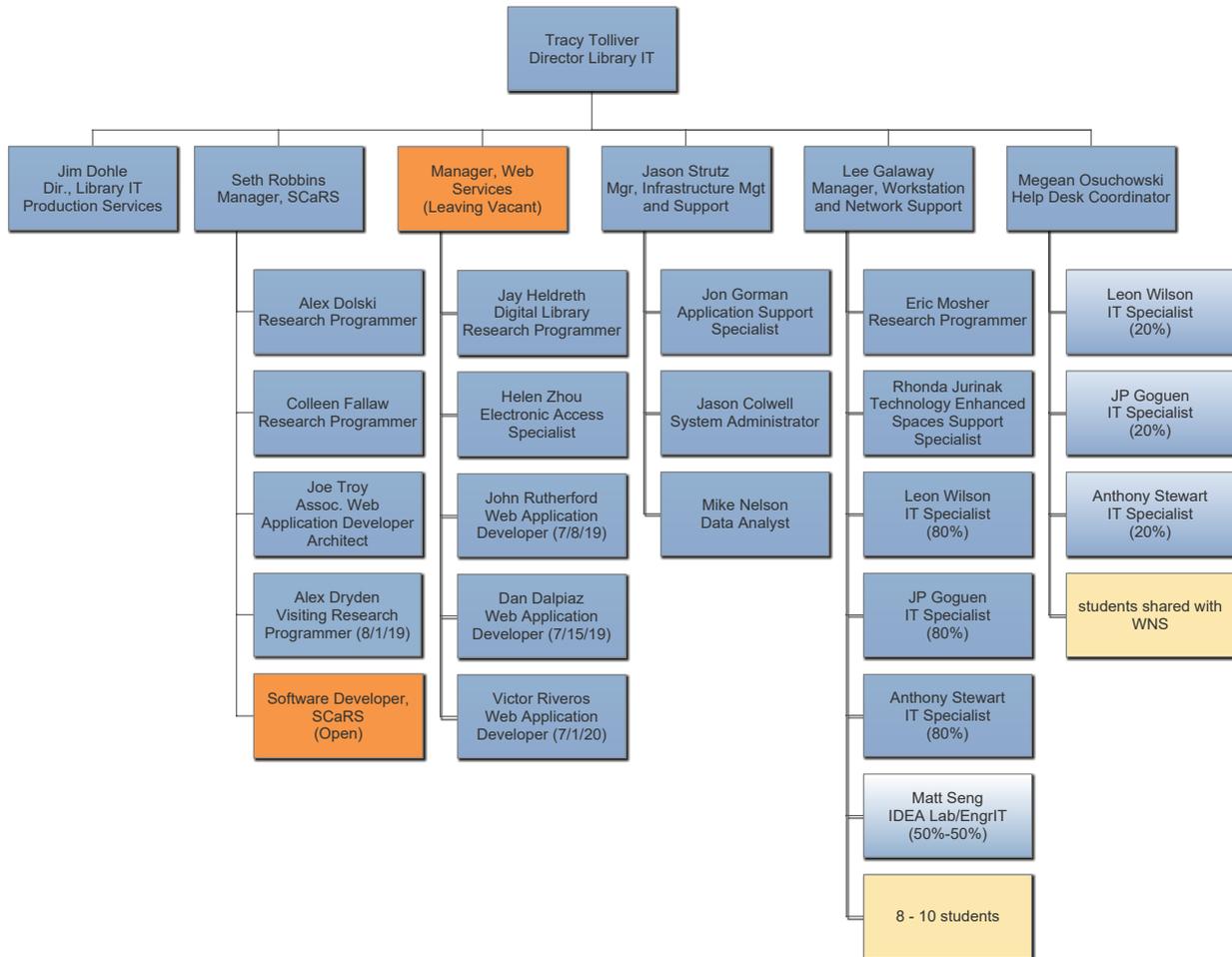
Statistical Profile

Facilities

Library IT personnel occupy office space in Room 424 and 424c of the Main Library and 422 of the Main Library. The workroom in 424b is heavily used. Additionally, 315 square feet in Room 424a, 135 square feet in Room 438 and 287 square feet in Room 19c are used for hardware storage and maintenance. Main Library Room 416 will be vacated during FY21.

Personnel

Here is a current unit organization chart as of 7/1/2020.



Student Hourly Staff employed by Library IT are paid from printing revenue. Staff employed during FY20 included:

- Damian Behymer (7-1-19 to 6-30-20)
- Elaine Houha (7-1-19 to 12-14-19)
- Sameer Jain (7-1-19 to 5-30-20)
- Alyssa Barker (7-1-19 to 6-30-20)

Adan Zermeno (7-1-19 to 6-30-20)
Nathan Hadi (7-1-19 to 6-30-20)
Taliah Ray (8-25-19 to 6-30-20)
Saleel Fobbs (8-25-19 to 6-30-20)
Kennedy Allen (9-22-19 to 6-30-20)
Ayat Jaber (9-8-19 to 11-16-19)
Andrew Bortey (9-22-19 to 2-22-20)
Amy Han (10-6-19 to 12-14-20)
Ayah Jaber (10-6-19 to 6-30-20)

User Services

HD

- Library IT Help Desk Loaner inventory
 - 68 Laptops (58 PCs & 10 Macs)
 - 4 iPads
 - 2 Lync speakerphones
 - 1 Microphone
 - 8 Headset microphones
 - 6 Projectors
 - 4 External CD/DVD burners
 - 3 Video cameras
 - 1 Portable video kit with tripod and mic
 - 4 Voice recorder kits
 - 2 Webcams
 - 2 external GPUs

WNS

- Classroom & instructional space technology support
 - Main Library Room 314
 - 15 student Desktop PCs
 - 1 Instructor Desktop PC
 - 1 overhead projection unit
 - UGL Room 291
 - 40 student Desktop PCs
 - 1 Instructor Desktop PC
 - 1 overhead projection unit
 - Integrated sound system
 - ACES Room 509
 - 30 student Desktop PCs
 - 1 Instructor Desktop PC
 - 1 overhead projection unit
 - Integrated sound system
 - Grainger IDEA Lab

- Planar 16 display video wall with HP workstation
 - Presentation space with two 84" LED 4k displays and HP workstation
 - Presentation space with one 84" touch screen LED 4k display and HP workstation
 - 5 mobile units with HP workstation and 55" LED 4k displays
 - 5 mobile units with HP workstation and 65" LED 4k displays
 - 10 collaboration tables with 42" LED displays and video switching
 - 3 TAZ 3d printers
 - 2 mobile carts with 58" LED displays for patron laptop use
- Public service point support
 - 40 circulation workstations throughout the various unit libraries
- Public printing
 - 41 public access printers
 - Associated print release stations
- Technology programs support
 - Scholarly Commons
 - 16 public access workstations (PC and Mac)
 - 4 faculty/staff workstations
 - 2 laptops
 - Media commons
 - 6 public access workstations (Mac)
 - 2 faculty/staff workstations
- Other public facing service support and training
 - Rhonda Jurinak hosted dozens of training sessions on the technology offered in Library conference rooms.

IMS

- **Server and service counts**
 - 140 virtual servers (includes development, test, and sandbox/innovation servers), down from 167 last year
 - Numerous resources allocated in Amazon Web Services, detailed in IMS budget documents
 - ~50 public-facing services
 - Some important patron-facing IMS supported services include:
 - The Library Gateway and all Library websites
 - Easy Search
 - Online Journals and Databases, the Journal and Article Locator, and the A-to-Z list
 - Interlibrary Loan and Document Delivery
 - Electronic Reserves including streaming media
 - The Voyager catalog
 - Public Printing

- Wide and varied digital collections, including the Illinois Digital Newspaper Project, Illinois Harvest, Brittle Books, Kolb-Proust, and many smaller, specialized collections
- Ask a Librarian
 - ~30 services used primarily by Library faculty and staff
 - ~30 services internal to Library IT in support of those other services
 - ~260 databases (includes development, test, and deprecated databases)
 - ~255 distinct websites / web applications

Web Team

- 48 websites on the primary Wordpress instance
- 1 additional website on secondary Wordpress instances (sidecar)
- 15 websites on cPanel hosted Wordpress stacks
- Over 9000 pages of content
- We had 1,098,290 pageviews on the Library homepage/gateway between 8/26/19 and 8/26/20.
- We had 2,273,796 pageviews on the 50 primary Library websites between 8/26/19 and 8/26/20.

SCaRS

The list of services created and/or maintained by this group includes:

- IDEALS: The campus's Institutional Repository.
- Vireo: The campus's Electronic Thesis and Dissertation (ETD) deposit system, a collaboration between the Library and the Graduate College. The team also supports an instance of Vireo for undergraduate thesis deposit.
- Illinois Data Bank: The repository service for the Library's Research Data Service.
- Illinois Digital Library: A digital library application that provides a public-facing interface for the Library's digital collections.
- Search Gateway: An application, currently in development, that federates search across our various digital library platforms.
- Cantaloupe image server: An in-house developed, open-source, high-performance dynamic image server that is used to power high resolution image viewing in the Illinois Digital Library and Illinois Data Bank.
- Medusa Collection Registry: The Library's digital preservation system and collection registry.
- Illinois Open Publishing Network (IOPN): A series of applications—all of which are instances of open source software projects—that comprise the Library's open access publishing platform. IOPN includes instances of Omeka S, Omeka Classic, Open Journal Systems (OJS), Open Monograph Press (OMP), Commons in a Box (CBOX), CommentPress, Pressbooks, and Scalar.

Other Statistics

WNS

- Hardware
 - 231 public access computers – authenticated use
 - 49 public access computers – unauthenticated use
 - 102 classroom PCs
 - 38 circulation desk PCs
 - 41 public access printers
 - 444 faculty/staff desktop units (PC and Mac)
 - 183 faculty/staff laptop units (PC and Mac)
 - 75 loaner laptop units
 - 121 networked staff printers (laser, receipt and MFP)
 - Thousands of network ports
 - 33 network subnets maintained

Appendix A – Idea Forms

1. Notification that OAUTH2 will be required for mail, forcing an upgrade of OTRS in the next calendar year
2. Project to remaster and reindex about 12 TB of digital materials previously ingested as bit-level preservation to improve access and discovery of digital collections, particularly for rare book and manuscript content.
<https://help.library.illinois.edu/otrs/index.pl?Action=AgentTicketZoom;TicketID=77200>
3. Project to establish space for TAM proceedings for PSED.
<https://help.library.illinois.edu/otrs/index.pl?Action=AgentTicketZoom;TicketID=76345#355543>
4. Infrastructure support for hybrid cloud/on-prem exploration of 3d virtual reality content, machine learning, and artificial intelligence branded Project Komodo.
<https://help.library.illinois.edu/otrs/index.pl?Action=AgentTicketZoom;TicketID=75565#351831>
5. Consultation for I-School project for 8 week AWS practice.
<https://help.library.illinois.edu/otrs/index.pl?Action=AgentTicketZoom;TicketID=69100>

Appendix B – Progress on FY20 Goals

Help Desk

- *Serve as liaisons to non-technical Library faculty and staff, building relationships on shared Library knowledge and experience.*
 - Coordinated with Staff Development and Training Committee and ILS Migration Team for Zoom livestreaming and recording Library-wide training sessions and hosting recordings in Media Space.
 - Liaisons for ILS migration on permissions and systems integration.
- *Continue iterative development of IT unit and Help Desk web presence.*
 - Created online guide on resources and technology for working remotely.
- *Coordinate evaluation of effectiveness and satisfaction for emerging technologies within the Library.*
 - Helped Staff Development and Training Committee set up private Media Space channel for Library employees to watch recorded training sessions. The Media Space platform will help the committee track interest and viewing data on recordings.
- *Explore ways to derive meaningful insights from OTRS ticket data.*
 - Shared weekly reports on open tickets.
- *Continue development on service commitment information and documentation.*
 - Continued development on a service commitment web application to share service information to library employees as well as public, and document information for internal needs.
- *Assist in testing, configuration, and preparation for ILS migration in June 2020*
 - Successful migration to Alma in June 24, 2020.
 - Migrated user permissions from Voyager to Alma
 - Working with Jon Gorman and Library units, identified and prioritized systems interacting with Voyager and integrated them with Alma

Workstation and Network Support

- Complete migration from Windows 7 to Windows 10.
 - Complete
- Continue hardware refresh as budget allows.
 - Ongoing
- Purchase, install and configure hardware for the new first floor service point.
 - Complete
- Purchase, install and configure technology for Main Library Room 220.
 - Purchase complete, project ongoing
- Research and implement printing solution for Alma implementation.
 - Complete

Infrastructure Management and Support

- Retire tier 2 storage by December 2019 – **Accomplished**
- Retire CrashPlan storage by September 2019 – **Accomplished**

- Create data marts for use in Tableau – **Data sources identified; implementation expected in FY21**
- Automate and improve processes in BHRSC – **Built on BHRSC onboarding efforts to improve data collection and process flow**
- Began migration from Puppet to Ansible for serverless configuration management – **Migration expected to be fully complete October 2020**
- Process improvement
 - Medusa use cases – **worked closely with SCaRS to move forward and complete migration of Medusa services in Amazon Web Services**
 - Service catalog processes – **Catalog application completed, data entry began**
 - File server needs – **deferred until we receive lessons learned from other departments retiring their file servers**
- Support for advanced technology
 - Amazon Web Services – **substantial uptake, primarily in repository and training**
 - NINJA – **deferred to FY21**
 - Data Registry – **deferred to FY21**
- Security activities
 - Implement CIS standards – **achieved tier 1 compliance, implementation of automated CISCAT evaluation expected in FY21**

Web Team

FY20 Goals

- Redesigned Building Project Website – waiting for production launch approval.
- Launched redesigned Gateway page with restructured navigation menu for entire site.
- Launched redesigned Libraries and Hours page.
- Introduced new Library Technology tab.
- Launched Illinois Newspaper Project site.
- Launched redesigned SLCA site.
- Developed new Preservation Services site, unit currently working on content.
- Built Email Archives Grant project website.

Scholarly Communications and Repository Services

During FY20, the team’s primary focus has been a rebuild of the IDEALS Institutional Repository. The rebuild is a complete rewrite of the existing features using the ruby on rails platform, but with the Medusa Collection Registry to manage asset storage in a manner similar to the Illinois Data Bank. Like our other repository applications, the rebuild is being deployed in our AWS environment.

We have also made significant progress towards upgrading and adapting our Vireo Thesis and Dissertation deposit system to the most recent version released by the Texas Digital Library. We have staging versions setup for both the Graduate college and the team running undergraduate thesis deposit to review. We expect the version to need much less custom coding than past versions which will make our deployment of the software much more sustainable going forward.

Another major project for our team has been in adapting to personnel changes. One of our longest serving team members, developer Howard Ding, left in October 2019, which led to significant effort spent in cross-training other developers to maintain the applications that Howard had been heavily involved with. This has also led us to restructure our development process to be more team oriented taking inspiration from agile methodologies and Scrum in particular. We are also engaged in a search for a new developer to fill the vacant position and, as part of that process, working on planning onboarding for that individual to ensure a smooth transition. At the beginning of FY20 we were similarly engaged in onboarding Alex Dryden, hired as the Programmer for Scholarly Communications and Publishing, whose main duties are to support the IOPN applications and infrastructure.

As of FY20 planning has begun in earnest toward extending our repository applications and services to other institutions in Illinois via the Carli Consortium. Presently, the effort is in the planning phase, with both developers and product owners working to understand the technical and business needs of the project.

Of course, with the Covid-19 pandemic this has been a year of challenges and difficulty. Fortunately, our team is able to work remotely with minimal disruption, and, after a brief period of adjustment, we've been able to resume our prior level of productivity.

IDEALS –

Ideals is currently undergoing a rebuild using the Ruby on Rails platform. The Medusa Collection Registry will be used to manage asset storage and, as such, the IDEALS rebuild is designed to be deployed in our AWS environment, taking advantage of the existing infrastructure we have set up there. The rebuild process has been undertaken by Alex Dolski, with requirements gathering work being done by Colleen Fallaw. The Demo application is live with many features having been implemented, including user authentication and authorization, a revamped site structure based on academic unit, improved item discovery, item display, and handle server integration. During this time, we've continued to keep the previous version of IDEALS operational, supporting batch ingests and other operational tasks.

Vireo –

The team at Texas Digital Library released a new version of the Vireo Electronic Thesis and Dissertation deposit software, Vireo 4, during FY19. The new version is built upon the Spring MVC framework and utilizes the AngularJS framework for its user interface code, both of which are new to the repository developer team. In setting up the new version of Vireo for testing, Seth Robbins and Joe Troy spent time getting familiar with the new code. The new version was setup using campus cluster VMs under complete control by the library, rather than the tech services managed Red Hat machines that hosted the previous version. Moving to library-controlled infrastructure will allow us to more efficiently provide support for the applications going forward.

Medusa AWS infrastructure –

Joe Troy has made significant progress in helping us to control costs of our AWS infrastructure. In FY20, Joe coordinated with Library IT's IMS team to purchase "reserved instance" virtual machines for our application servers, leading to a saving of thirty percent on our cost for our EC2 virtual machines. Previously, Joe led the effort to use AWS's intelligent tiering to ensure that our assets are stored in the most cost-effective tier of Amazon's S3 object storage.

The Medusa Collection Registry –

As mentioned, Howard Ding left the library in FY20. Howard was a key member of our team having developed the Medusa Collection Registry from scratch. Howard was Medusa's main agent for support and further development and so took with him a vast amount of institutional knowledge. Since Howard's departure, Colleen Fallaw has worked to automate much of the operational workload in the Collection Registry. Colleen was able to leverage her experience automating many types of file uploads to the Illinois Data Bank in order to improve the ingest process for the collection registry, allowing it to work much more seamlessly without developer intervention and making sure our patrons have feedback from the process that allows them to debug their own ingest packages.

Illinois Data Bank (IDB) –

Developer Colleen Fallaw has continued to support the Illinois Data Bank and participate in planning and outreach for the research Data Service. Most recently the IDB has been upgraded to use the most recent versions of the Rails libraries and has been retrofitted to use version four of the bootstrap interface library.

Illinois Digital Library, Search Gateway, and Cantaloupe Image Server —

Alex Dolski has continued to support the Illinois Digital library, our Search Gateway for digital collections and the Cantaloupe Image Server. Few new features have been added since Alex has been spending development time on the Ideals rebuild. Late in FY20, we were asked to extend the authorization system in the Digital Library application to support the Emergency Temporary Access System. Alex was able to rapidly develop features to support the access requirements. The features are live as of this writing (in early FY21): physical materials digitized for access during the Covid-19 pandemic can now be delivered to users via the digital library. Access can be limited to one user at a time, and permissions are automatically rescinded after 21 days.

Carli Consortium Repository –

Discussion around the Carli Repository has been led by Kyle Rimkus. As of the end of FY20 we have generated a set of three infrastructure models to be considered. Plan one assumes a monolithic repository application, one deployed instance of Ideals, that handles data for all institutions while keeping access to institutional collections separate. Plan two assumes separate instances of Ideals for each institution, but one instance of the Medusa Collection Registry managing file assets for all

institutions. Plan three instances separate instances of Ideals and Medusa for UIUC and CARLI. Currently, Joe Troy is working to imagine the infrastructure cost for each of these plans in order to develop a rough pricing model for the service in conjunction with our partners at CARLI.

Illinois Open Publishing Network (IOPN) –

During the beginning of FY20 we were engaged in onboarding Alex Dryden, who had just started as the Visiting Research Programmer for Scholarly Communications. Alex was able to quickly learn how to maintain and develop on the infrastructure using documentation left by the previous programmer, Chris Maden. In the interim, Alex has been able to upgrade the applications that make up the IOPN infrastructure and has developed a new feature for Omeka-s that more cleanly separates exhibit assets between different users.