Managing the E-Resource Ecosystem: Creating a Process for Sustainable E-Resource Life Cycle Workflow Analysis and Oversight

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This paper will address the creation and implementation of the University of Michigan Library's Electronic Resources & Database Management (ERDM) Workflow Team, a sustainable, ongoing group charged with analyzing library workflows related to electronic resources. The methods employed by the team, the findings and recommendations made, and some of the challenges encountered will also be explored. Finally, the team's eventual expansion into the recently established Collections Workflow Team, which encompasses workflows within the Collections Division, will be discussed.

Introduction

Workflow analysis and process mapping are established tools employed within libraries. The University of Michigan Library has expanded this to implement a continual review of processes. The Technical Services department of the University of Michigan Library includes two major sections, one devoted to electronic resources and one devoted to print and other physical materials, with several smaller units within each of those sections. Out of the sixty Technical Services employees, twenty-one work within the Electronic Resources & Database Management (ERDM) section (figure 1). Because so many individuals and several related but separate units help to manage and provide access to the library's electronic resources (Electronic Access; Electronic Acquisitions and Licensing; and Electronic Cataloging), and because the library was working towards deploying an electronic resources management system (ERMS), a focused workflow analysis project was conducted in 2012. The purpose of this analysis was to identify and evaluate the efficiency of established electronic resource workflows and to identify areas of the electronic resource lifecycle that could benefit from the creation of new workflows. The 2012 analysis was especially important as the library was facing a large number of retirements and potential loss of institutional knowledge.

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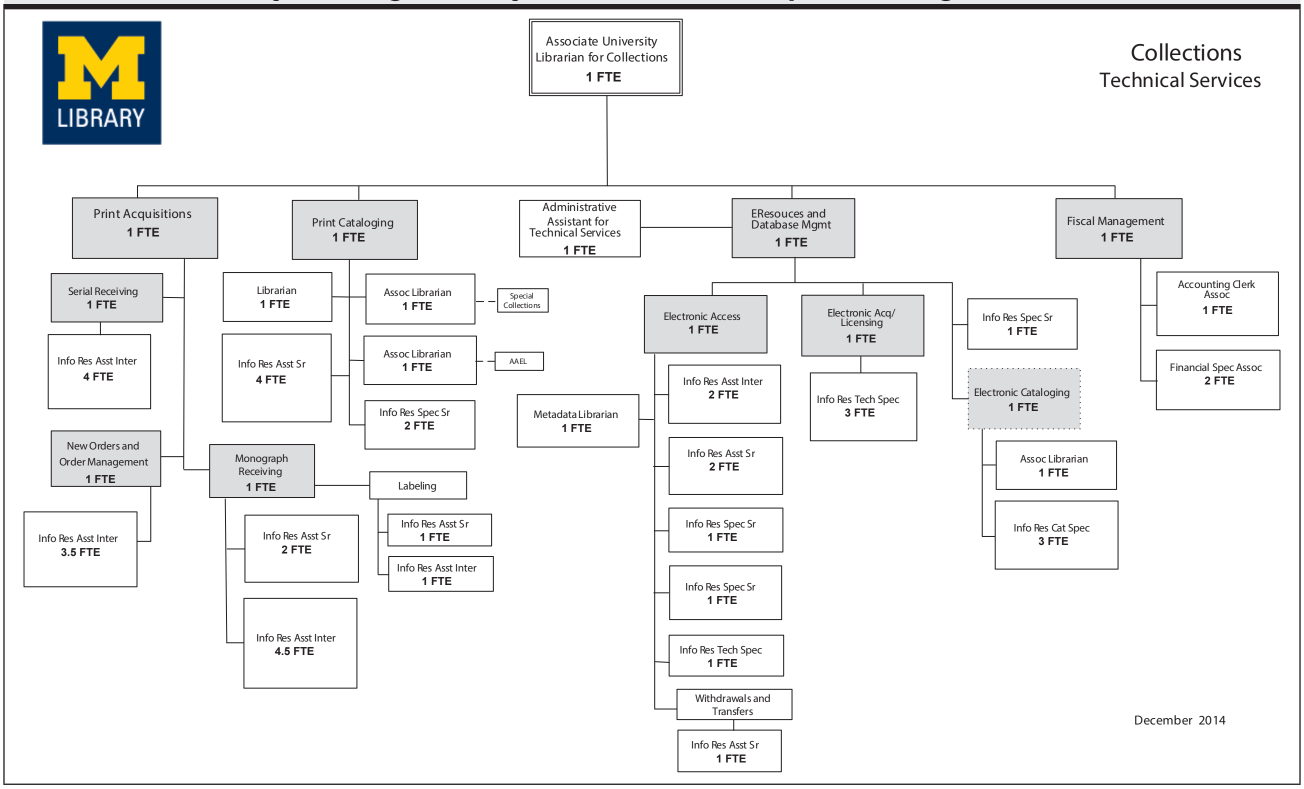
FIGURE 1
University of Michigan Library Technical Services Department Organization Chart

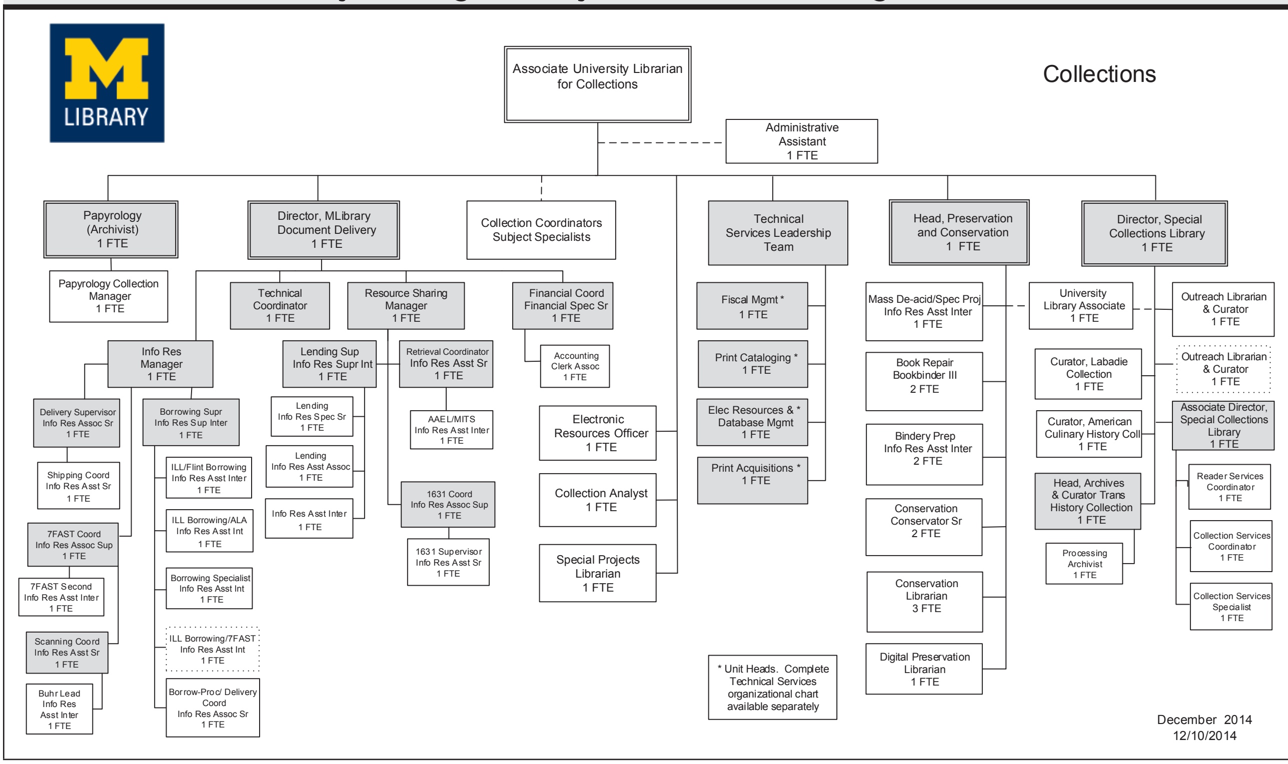


As a result of the 2012 analysis, the formation of a permanent team devoted to the assessment and oversight of electronic resource workflows and to continued workflow analysis was recommended. Members of the team, consisting of both professional staff and librarians, were assigned or recruited from each unit within the ERDM section. The inclusion of members from units outside of the ERDM section and Technical Services which are impacted by electronic resource workflows, such as reference staff and subject specialists, was also determined to be important. In order to ensure continuity while encouraging new perspectives, some team members are considered permanent while others serve two-year terms. This paper will address the creation and implementation of the ERDM Workflow Team, a sustainable, ongoing group charged with analyzing library workflows related to electronic resources, the processes employed, the team's findings and results, some of the challenges faced, and the team's eventual evolution into the recently established Collections Workflow Team, which encompasses workflows within all of Technical Services and its sister units in the Collections Division.

Literature Review

Examination of the recent literature found that workflow management is a popular topic in library and information sciences professional literature. This review of literature uncovered a wide range of goals for workflow analysis among institutions. The American University libraries in Washington, DC revised workflows due to a reorganization of technical services staffing.[1] The University of North Carolina Library instituted a project to educate new staff about workflows and to promote efficiency in technical services.[2] Wayne State University formed an Electronic Resources Integration Task Force between 1998 and 1999 to manage the shift from print to electronic materials.[3] The University of Victoria Library (British Columbia, Canada) dealt with workflow changes in response

FIGURE 2
University of Michigan Library Collections Division Organization Chart



to key staff retirements.[4] In some articles, workflow analysis was recommended as a necessary step for the implementation of an ERMS.[5] Several authors emphasized the development of new workflows related to changing models of acquisition,[6] and others studied existing workflows in order to forecast the future tools and systems needed by libraries.[7] However, each of the published case studies focused on a short-term project or response to a specific occurrence. This paper, describing the University of Michigan Library's current efforts that recently established a permanent workflow team, addresses a gap in the body of recent literature from academic libraries on the topic of workflow analysis.

Background

Although much of the existing literature addresses workflow analysis stemming from a library's need to reorganize and rethink its structure, that was not the case at the University of Michigan. The need for the 2012 analysis grew from the pending implementation of an ERMS and a large number of anticipated retirements of experienced, long-term employees. The ERMS implementation required a neutral analysis and clear understanding of the units' needs. This made it necessary to identify the existing workflows and any issues that they presented. The 2012 analysis revealed many areas in need of improvement. A wave of retirements in 2009, followed by several additional key retirements between 2012 and 2014, presented the challenge of providing the same level of service with fewer staff, as many of the vacated positions were not filled. The accompanying loss of institutional knowledge necessitated the creation and maintenance of better documentation.

In light of the 2012 analysis it became evident that an ongoing team and a more comprehensive system of review would enable the ERDM section to stay abreast of the changing environment of the electronic resources landscape and associated workflows. Examples of changes requiring workflow analysis include moving from one link resolver to another, introducing an additional discovery layer, adopting a demand driven acquisitions pilot, and implementing a ticketing system to monitor electronic resource access issues. The ongoing nature of the ERDM workflow team ensures that all documentation is kept up-to-date, minimizing the risk of losing institutional knowledge in the event of staff retirements or departures.

The charge (Appendix A) allows the team to look at not only the particular workflow issue being addressed (Appendix B) but also at how the process fits into the larger picture of the work handled by the department. By creating a team of staff members across multiple units both within the ERDM section and outside of it, the team is able to monitor how work flows into, through, and out of each unit, as well as across units. This is particularly valuable for processes that impact several units but for which no one unit has sole responsibility. An holistic view allows the team to identify and address any instances where the workflow bottlenecks, stalls, overlaps, conflicts, or is lacking. This is especially important as the need for greater efficiency and productivity rises. In addition, by becoming a permanent part of the landscape of technical services, the team nurtures a culture of assessment, re-evaluation, and continual reinvention. This creates a welcoming environment where issues can be freely voiced and impartially examined without the fear of repercussions and also provides a platform for staff to raise concerns related to challenges encountered in their work.

The Process

The team works on projects assigned by the ERDM section's unit managers. These are initiated because of an external factor such as a change in software or a new platform that may require some modification in the work, or because of an internal matter such as a staff member leaving. The managers provide a basic description of the areas of concern and any questions they may have about the work and the role of other units involved in the process. The team then identifies the stakeholders by determining which staff are impacted, including those in public services and other units within Technical Services. Depending on the need or time constraints, stakeholders may be interviewed individually or as part of a focus group. During the interviews participants describe the steps they follow and provide their perspectives on the process under review.

The workflow team analyzes all of the input from managers and various staff then creates a document describing the key steps and decision points of the process. This document serves as an outline for charts which are created with workflow mapping software. The team uses separate "swim lanes" or sections for each unit involved (for example, selectors, acquisitions, cataloging), to illustrate how the processes move between units (figure 3).

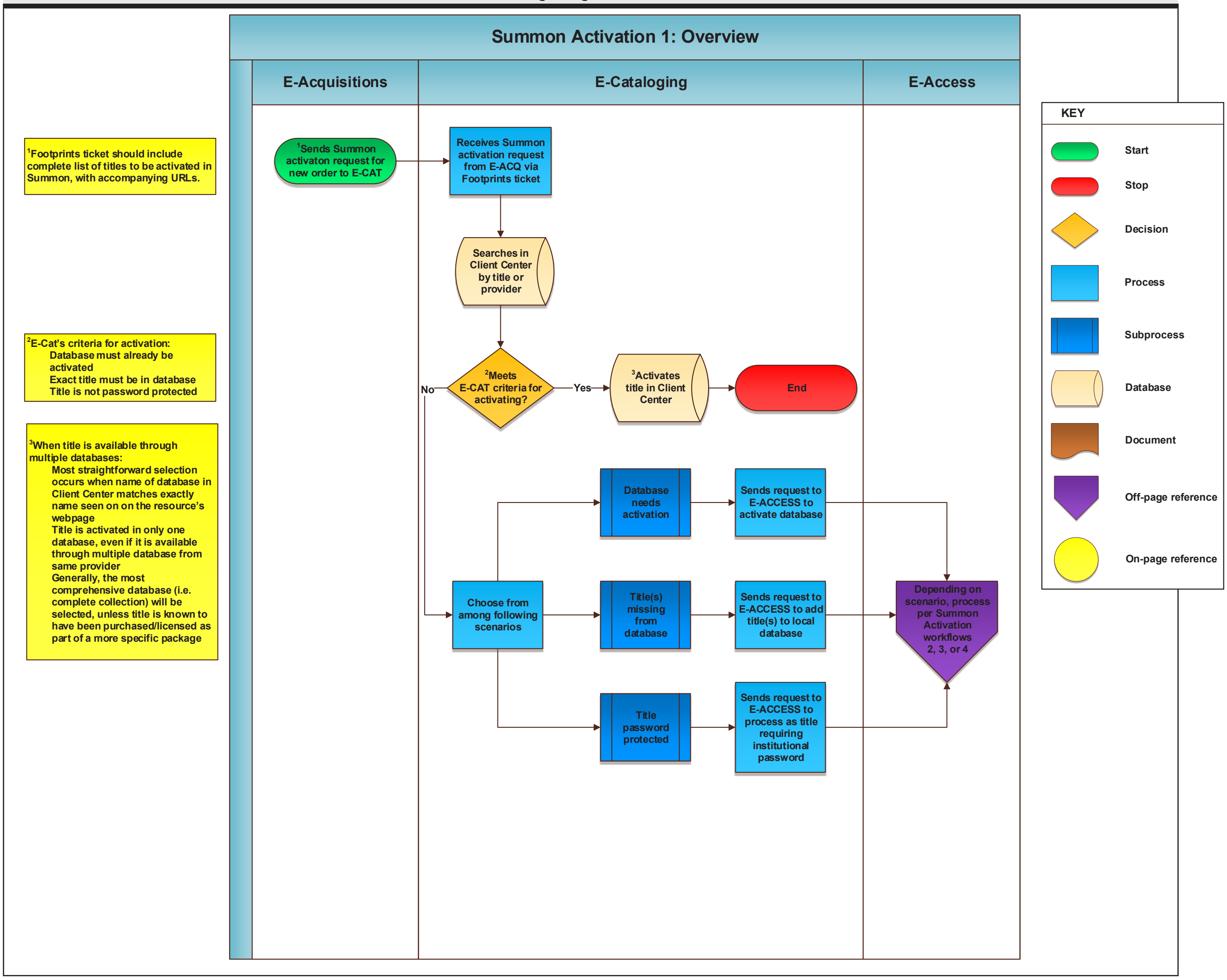
The team follows up with the managers to share the initial findings and seek feedback prior to revising the maps. The team will not only provide flowcharts, but also recommendations for larger changes that it believes will help streamline the process or better integrate it into existing workflows. Once the work is fully documented, the team meets with all stakeholder groups to provide training designed to address their specific needs. This is crucial for processes in which multiple units are involved because it helps facilitate communication, which can often be a challenge in a large organization. As needed, the team will repeat the analysis in whole or in part when staffing or processes change.

Findings, Recommendations, and Actions Taken

The ERDM Workflow Team was charged with acting on the recommendations and continuing the work of the 2012 analysis. Within twelve to eighteen months, the team addressed a majority of these recommendations. Examples of the initiatives the team worked on during this time period include:

- encouraging regularly scheduled section meetings
- cross-training staff
- streamlining discovery layer maintenance
- defining a new workflow for managing title lists for packages

FIGURE 3
Overview of Discovery Layer Maintenance Workflow



- realigning the connections between help desk ticketing systems for ordering and cataloging electronic resources
- planning and implementing a new help desk ticketing system to track electronic resource access issues
- documenting cancellation workflows and concerns about post-cancellation access to electronic resources

The team was also charged with reporting and disseminating its findings. Once the findings were finalized, the team contacted the departments and committees impacted by the analysis and was allotted time within regularly scheduled meetings for members of the team to present the findings. Each presentation was tailored to the needs and expertise of the audience. Given the diversity of the stakeholders the team chose to communicate its findings in many different formats, including formal reports, a list of issues discovered to be inadequately addressed by existing policy and procedures, a detailed list of recommendations and a shorter compilation of top recommendations. Visualizations of the data such as of workflow charts, pictured network interconnections, and a matrix of responsibilities were also provided since the written report alone may not have created the needed level of understanding (figure 3, figure 4, figure 5).

FIGURE 4
Staff Responsibility Matrix for Electronic Resources Management

E-RESOURCE LIFECYCLE	TASK	SUBJECT SPECIALISTS	E-RESOURCES OFFICER	E-ACQ & LIC. UNIT	E-CAT UNIT	E-ACCESS UNIT	ERMS MANAGER
SELECT	Manage trial	x	x				
	Evaluate and select e-resource	x	x				
	Negotiate pricing	x	x				
	Assign budget and approve purchase	x	x				
	Publicize e-resource to users	x					
	Negotiate 3-campus and consortial purchases	x	x	x			
ACQUIRE	Negotiate license		x	x			
	Place order		x	x			
	Identify and communicate license terms of use	x	x	x			x
	Process invoice and authorize payment		x	x			
	Coordinate and track reimbursements	x	x	x			
	Process renewals and cancellations	x	x	x			
PROVIDE ACCESS & MAINTENANCE	Oversee activation of user access			x	x		
	Update Search Tools	x					
	Maintain OpenURL link resolver					x	
	Load/create/edit bibliographic records			x	x		
	Activate e-resources in Summon				x	x	
	Update coverage and holdings			x	x	x	
	Oversee Deep Blue normalization					x	
	Perform URL maintenance				x	x	
ADMINISTER	Facilitate high level browse				x	x	
	Perform authority control					x	
	Creates or maintains title lists			x	x		
	Track title and publisher changes			x	x	x	
	Track platform changes	x			x	x	
	Track vendor and publisher contacts	x	x	x			x
	Correct reported errors in Mirlyn cataloging				x	x	
	Gather usage statistics	x	x				x
	Participate in copyright determination					x	
PROVIDE SUPPORT	Troubleshoot/triage outage problems				x	x	
	Correct subscription-related problems			x			
	Perform e-access quality control				x	x	
EVALUATE & MONITOR	Log and analyze incidents		x		x	x	
	Log and analyze breaches		x				
	Provide collection evaluation analysis	x	x				
	Manage preservation and archival units			x			

As employees in the ERDM units saw the value of the work generated, they drew the team's attention to other functions in need of analysis and proposed additional problem areas for consideration. These efforts included revisiting the help desk ticketing system, addressing gaps and redundancies in discovery layer maintenance, investigating the process for providing access to password protected electronic resources, reviewing the overlap between electronic and print workflows, and evaluating the process of labeling physical materials.

Benefits and Challenges

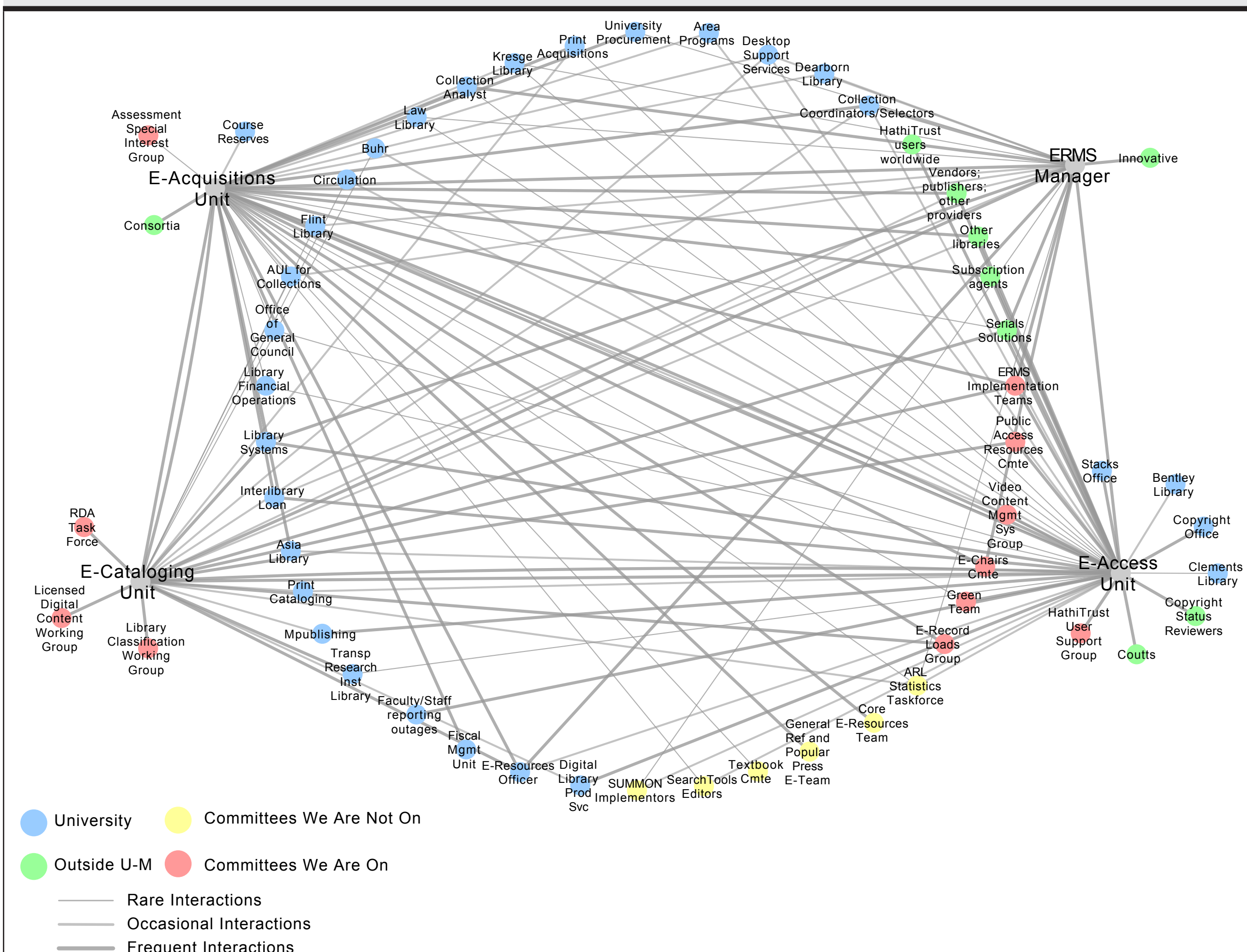
There are many benefits to sustained and well managed workflow analysis, but difficulties can arise when questioning staff about their work. Even when workflow analysis is officially sanctioned, administrators, managers, and staff may be resistant to the findings and recommendations. There is always the possibility that the analysis will have unexpected results or results that upend the status quo. Ultimately, the benefits strongly outweigh the challenges of creating and sustaining a culture of workflow analysis. When done well, workflow analysis allows for rational decisions using evidence and data, rather than decisions based on habits and assumptions. This is not to say that the human element should be ignored, but it should be just one of the factors used to make a decision.

One of the main findings in the 2012 analysis was that mistakes were made due to communication breakdowns and a lack of understanding of how processes impacted other functions. A transparent approach leads to better communication, which is a major benefit to all involved. For example, the establishment of a help desk ticketing system to track electronic resource access issues has allowed staff to better identify and address continually problematic resources. The ticketing system has also created a means for reference staff and the Electronic Access Unit staff to easily communicate and update each other regarding electronic access issues. The system also provides a mechanism for archiving and sharing important communications, which previously had been siloed in an individual's e-mail, and for making information on current access problems publicly available.

Another significant benefit of the team's work has been the elimination of redundancies and the clarification of staff responsibilities. For instance, while discovery layers can be very powerful, they require well-designed maintenance procedures. Two different problems were observed with respect to these procedures. First, the activation of e-books in the discovery layer was not occurring in certain units, which was solved by redistributing tasks. Second, there was no defined workflow addressing the activation of new title lists in the discovery layer, which led to the duplication of effort across units. By codifying specific tasks and streamlining the process to free staff's time for other responsibilities, the work is now completed more effectively and efficiently. In addition, a well-maintained discovery layer has improved discoverability and access markedly for the library and its users.

Despite many benefits, changing processes can also create new challenges. When the team's workflow

FIGURE 5
Visualization of ERDM Communication Network



analysis identifies an unexpected solution, it can lead to major changes in responsibilities or the accustomed level of work. In light of ongoing budgetary constraints, employees worry about losing their jobs, or having their positions restructured in ways that they find unsatisfying or would require skills they do not currently possess. When uncomfortable with the prospect of changes, staff may withhold institutional knowledge, whether intentionally or unintentionally. This can be a natural reaction to uncertainty. By being sensitive to these apprehensions, the team is able to reassure staff through the use of transparency and change management strategies. These strategies include providing an impartial and welcoming forum for staff feedback, managing expectations, and building skills and resiliency among staff members so they feel empowered to take on new responsibilities and explore their full potential.

Another challenge the team faces, which is perhaps one of the most difficult, is maintaining institutional knowledge. The availability of current documentation aids in training new staff members and managing the library's collection. It is necessary to prioritize the work that needs to be kept up-to-date because the volume can be overwhelming. It may be difficult to keep all documentation current, but it is necessary to establish mechanisms to do so.

Scope creep is another potential pitfall. It is important to have effective parameters and a well-defined charge to keep the team focused on the project's scope. The team must be able to acknowledge tangential issues that arise without allowing them to derail the project. This can be a very delicate balance; careful judgment by the team is required to make these determinations.

Some of the workflow issues brought to the team's attention lie outside of the ERDM section and thus were beyond the scope of the team's charge. A variety of the issues encountered were a legacy of a decade-old reorganization of Technical Services that divided the processing units into two separate sections, one for physical materials and one for electronic resources. Over time this has created serious gaps in knowledge, which have impacted the functioning of both sections.

Where Are We Now?

In an effort to address the growing need for workflow assessment and oversight, the team recently underwent some significant changes. The charge has expanded to include not only ERDM section work but processes found within the entire Collections Division. The new name, Collections Workflow Team, reflects this expanded scope. Led jointly by two of its members, the group now takes its assignments from and reports to the Associate University Librarian for Collections and the Collections Division Managers group (figure 2).

In addition to extending its support to the rest of the division, the team no longer focuses exclusively on electronic resources. Workflows for physical materials, as well as overlapping processes between those and electronic resources, are included under the new charge. Providing workflow support for document delivery services and digital preservation efforts—to give just two examples—could now fall under the team's new charge, should the need arise. The team's membership has grown in order to assume these new responsibilities, adding a member from each of the Print Ordering, Print Cataloging, and Interlibrary Loan units. Having more members also enables the team to handle an increased workload while sustaining its commitment to circling back to reevaluate workflows already reviewed.

To further address these needs and to encourage thoughtful process design, the team is actively advocating that workflow management be made an integral part of every unit supervisor's responsibilities. The team leaders are working more closely with supervisors in the division, offering one-on-one instruction on workflow techniques and strategies, and training on how to use process mapping software. The team will continue to look at the big picture and to help library management assess the future of technical processing.

The Collections Workflow Team also seeks to improve communication and coordination between the central Technical Services Department and other units in the library where technical service processing occurs, including the Asia Library and the International Studies Department. By increasing collaboration, the team aims to introduce greater consistency and efficiency in how all collections materials are made available to the library's patrons, regardless of where the materials are processed.

More broadly, the team will continue to promote workflow awareness across the library through various outreach efforts. In the past year, members of the team have helped facilitate training sessions, workshops, and boot camps around workflow mapping methodologies, techniques, and tools. Currently the team leaders are assisting two librarians from Michigan Publishing in mapping the various processes related to new manuscripts, from acquisition to publication. Lastly, the team maintains an active presence on the library's staff intranet, keeping staff abreast of the group's activities, encouraging feedback and collaboration, and providing easy access to workflow documentation, presentations, and literature.

Conclusion

The impact of the team's workflow analysis and process mapping has been far-reaching. These efforts allow for both a high level view of the work, as well as a close look at the details involved. The team is creating an environment where such work is an integral part of every unit's responsibilities by instilling a deeper awareness of the benefits of workflow analysis throughout the organization. By developing a culture of continuous assessment, the team is also laying the groundwork to adapt better to the increasingly complex nature of technical services processing. Due to the ever-evolving work of the library, there is a clear need for a permanent team committed to overseeing sustained workflow analysis.

Appendix A. E-Resources & Database Management Workflow Team Charge

The E-Units Workflow Analysis Report recommended that a permanent team be created to assess and oversee the electronic resources workflow. Under the direction of the Electronic Resources and Database Management Section Head and E-Unit Heads, the ERDM Workflow Team will assist the ongoing assessment and oversight of the e-resource workflow by monitoring productivity, efficiency, and accuracy across the Section and proposing enhancements. The Team's assignments from the E-Unit Heads and Section Head will include:

Proposing new methodologies and key measures for monitoring the overall effectiveness of ERDM workflows.

- Periodically reviewing Section procedures in order to identify streamlining opportunities and fine-tune best practices across the e-resource lifecycle.
- Reporting on the effectiveness of the existing workflow tools and suggesting additional opportunities to further leverage them.
- Investigating opportunities to further improve productivity and increase operational capacity through automation.
- Updating flowcharts and other workflow documentation and making these materials readily accessible to all stakeholders via the team's intranet page.
- Identifying workflow-specific training needs and contributing workflow-related content to training documentation across the ERDM Section.
- Promoting a culture of continuous process assessment and improvement at an individual level.
- Conducting outreach to library stakeholders via presentations and workshops, refresher training sessions, and updates via the library newsletter.
- Monitoring developments in workflow tools and best practices at peer institutions and incorporating these into local practices where appropriate.
- Reporting at least monthly on the status of the Team's efforts through the Team Chair's meetings with the Section and E-Unit Heads.

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Appendix B. Primary Types of Workflow Issues

Silos of information (leads to communication breakdowns)
Gaps in responsibility (unclear ownership of tasks)
Inefficient handoffs (lack of integration and coordination across units)
Overlaps (duplication of work by multiple units)
Inconsistencies in processing (two people doing same task differently)
Bottlenecks (frequent sources of delays in processing)
Lack of clarity in policies, procedures, and best practices
Excess of exceptions
Overly complex processes (tasks in need of clarifying and streamlining)
Outdated processes
Opportunities for automation (reliably repeatable tasks)
Training needs

Notes

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