



Discovery to Delivery

A Four-Part Examination of Future State Interoperability

Framework for Discovery-to-Fulfillment Systems Planning in the Context of
Big Ten Academic Alliance Resource Sharing

Big Ten Academic Alliance Libraries Discovery-to-Delivery (D2D)
Phase 2 Final Report

A Vision for Next Generation Resource Delivery

Next Generation Resource Delivery: Management System and UX
Functional Requirements

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Big Ten Academic Alliance Library Directors



Framework for Discovery-to-Fulfillment Systems Planning in the Context of Big Ten Academic Alliance Resource Sharing

A report to the Big Ten Academic Alliance Library Directors

May 2013

Project Team

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Executive Summary

PURPOSE

In May 2012, the CIC Library Directors commissioned a small project team to report on the range of issues and challenges pertaining to providing modern resource sharing services. A project team comprised of John Butler (Minnesota), Barbara Coopey (Penn State) and Lee Konrad (Wisconsin) was created to undertake this task, working in cooperation with CIC stakeholder colleagues.

The team was asked to pay particular attention to the challenges of creating a more seamless user experience from information “discovery” to “fulfillment.” The challenges of doing so have effectively come to the fore as a result of the recent CIC implementation of UBorrow, and by a variety of other factors such as the availability of the Rapid ILL service, and the introduction of web-scale discovery tools into our user environments. The team's work led to an exploration of the intersections, dependencies, and practices associated with facilitating discovery-to-fulfillment services within and across our libraries, and an attempt to identify themes and practices that could lead to improved integration of this work at either the local or consortial level.

This final report describes the team’s efforts, detailing stakeholder engagements and the themes that emerged from them, and a series of recommendations that should prove useful to the Directors as a possible framework for creating greater coherence in planning and decision-making processes which will, in turn, improve our collective efforts to improve the user experience within and across CIC libraries.

APPROACH

The CIC Library Directors have indicated a need for greater interplay, planning, and vetting of decisions between public services, resource sharing services, and technology services units to optimize the CIC libraries’ ability to develop and integrate systems and service layers in ways that CIC institutions might benefit.

In exploring these issues and shaping this report, the project team initially drew from relevant professional literature and anecdotal evidence provided by both colleagues and users. The project team then engaged primary stakeholders in an effort to understand their local practices, challenges, and desires with respect to discovery and resource sharing at their libraries.

Using two primary lenses, those being *the public service/patron experience* and *business processes/efficiencies*, the project team identified two overarching questions in response to the challenge:

1. How might an examination of discovery and resource sharing planning and decision-making processes help us identify/determine solutions and approaches for greater coherence and efficiency?
2. What is the potential for common solutions and/or greater integration with respect to resource sharing services and supporting architectures within the CIC?

FINDINGS

A number of themes emerged from the stakeholder engagements shedding light on the complexity of our discovery environments for users and the significant challenges and dependencies associated with the provision of modern resource sharing services. It is clear that the concept of “one-stop shopping” is attractive to users, that there are too many product/service options asserted within the user interface, and that despite our efforts, some complexities will be difficult to conceal from users. The challenge of communication, both with users and with staff working across functional lines, stands out as a primary opportunity for improving both the user experience and our business processes.

The project team determined that a potentially useful course of action would be to develop a framework that CIC institutions and colleagues might find useful in planning for and addressing both institutional and consortial needs and interests. The project team characterized this framework in terms of an “ecosystem” consisting of our users, staff, and three primary functional components, those being: discovery, fulfillment, and technology. Each of these components can be viewed as functioning independently *and* interdependently within the environment. The ecosystem of discovery-to-fulfillment processes, with respect to resource sharing, is unclear and complex to users. Efforts to improve the environment may be realized most effectively through a “systems” approach to planning at both the institutional and consortial levels. The goals of establishing this framework and the recommendations to meet them follow.

GOALS AND RECOMMENDATIONS

1. Develop clear governance and decision-making processes in areas of high interdependency. In highly interdependent operational areas in the CIC (e.g., resource sharing), develop well-understood processes for exploring options, planning, decision-making, and execution. Apply “systems” approaches and safeguard against unilateral actions or commitments that constrain collective action. The goal in mounting functionally-interconnected services is that they are richly responsive to the needs and intentions of each institution, as well as to the consortium.

Recommendation:

Formalize and document standardized processes for CIC resource sharing systems deployments and operational planning, decision-making, and execution.

Elements of a standardized process may include articulation of:

- End user requirements, expectations, and priorities
- Operational requirements
- Financial requirements and implications
- Technology requirements and implications
- Contractual requirements and other institutional commitments or constraints
- Policy considerations
- Decision-making authorities and sign-off processes

2. Support cross-functional planning and information exchange. Strengthen the exchange of ideas and institutional planning information across the consortium (across libraries and among diverse functional stakeholders within each library) relating to discovery-to-fulfillment systems’ ecosystem, integration, and support of service operations, with the creation of a more coherent user experience foremost in mind.

Recommendation:

Establish a small joint subcommittee (3-6 members) of representatives from the CIC committees in the functional areas of resource-sharing, public services, and technology with an initial two-year commitment, charged to oversee integrative coordination within the consortium related to services areas where there is a high level of functional *and* institutional interdependency.

Questions to Consider

- What might be done to ensure a smooth transition between discovery and delivery?
- What might we do to hide numerous, disparate systems from the user?
- What should be the predominant drivers as libraries explore new systems, technologies, practices?
- If tradeoffs must be made with respect to improving the user experience, which factors should be given greater consideration?
- Does fulfillment come at the expense of discovery?
- Does technical integration come at the expense of both?

- If, as Lorcan Dempsey asserts, “discovery happens elsewhere” or at least substantially elsewhere, how do we position our fulfillment services to achieve the seamless experience between “search” and “get it” that users expect?

3. Model an open architectural model for CIC discovery-to-fulfillment systems.

Develop an open architecture model for discovery-to-fulfillment systems for the CIC.

The model, to be conceived of at an abstracted level, would take into consideration the rapidly evolving changes in information discovery environment, variety of specific solutions in use, the discrete role of specific architectural components, the roles of standards, APIs, resolution, and data services to achieve *full* interoperability across our diverse technology environments. The model would serve as an educational and planning vehicle, helping to establish a common understanding of and guideline for such interoperability moving forward.

Recommendation:

Commission an independent analyst to review the overall CIC discovery-to-fulfillment system environment and submit recommendations for maximizing interoperability and complementary use of diverse technologies and systems across the CIC. The model would be presented to the relevant CIC committees and early-referenced joint subcommittee for review, dissemination, and potential action.

4. Strengthen efforts to exert collective influence. Exercise intentional collective influence on external entities (i.e., software and system vendors, publishers and content-providers, standards-creating bodies, policymakers, etc.) that will, in turn, influence the direction and capabilities of discovery-to-fulfillment services moving forward.

Recommendation:

- Strengthen coordinated efforts to identify, prioritize, and communicate CIC requirements of these systems and services to external entities of influence. In areas of critical need or opportunity, engage the Directors in exploring options for collective executive action.
- Continue collaborative work with vendors, such as Relais, the UBBorrow Service vendor, and other consortia who share the CIC’s interest in the development of standards-based open architectures and robust APIs that will, ultimately, enable highly functional discovery-fulfillment system integrations.

FULL REPORT

Framework for Discovery-to-Fulfillment Systems Planning in the Context of CIC Resource Sharing

PURPOSE AND ACKNOWLEDGEMENTS

In May 2012, the CIC Library Directors commissioned a small project team to report on the range of issues and challenges pertaining to providing modern resource sharing services in our consortial context. The team was asked to pay particular attention to the challenges of creating a more seamless user experience from information “discovery” to “fulfillment.” The challenges of doing so have effectively come to the fore as a result of the recent CIC implementation of UBBorrow, and by a variety of other factors such as the availability of the Rapid ILL service, and the introduction of web-scale discovery tools into our user environments.

A project team comprised of John Butler (Minnesota), Barbara Coopey (Penn State) and Lee Konrad (Wisconsin) was created to conduct this task. The team enlisted the help of CIC colleagues who work within the functions of public services, information technology, and resource sharing, working collaboratively to consider the challenge at hand. Ultimately, the team's work led to an exploration of the intersections, dependencies, and practices associated with facilitating discovery-to-fulfillment services within and across our libraries, and an attempt to identify themes and practices that might lead to improved integration of this work at the local and/or consortial level. The team submitted a *Preliminary Report on Resource Sharing Environmental Scan* to the Directors in November 2012, some of which is included here in order to provide context for the recommendations that follow. This final report and its recommendations serve as a suggested framework to guide the CIC libraries as we collectively strive to improve the experience of users as they set about the task of searching and finding information through local and global systems (discovery) and accessing and getting that information through a network of resource sharing providers (fulfillment).

The development of this report and its recommendations was made possible through the collective interest of CIC colleagues and in the key questions and considerations being raised around the interdependencies, challenges, and issues surrounding the provision of resource sharing services in today's academic library environment. The project team thanks its CIC colleagues who contributed insights, comments, and content for the report. In particular, the team thanks the CIC ILL Directors, Public Service Directors, and IT Directors for their efforts to engage in the process of producing this report, and in helping to explore the intersections of resource sharing, public services, and technology. Finally, the team thanks the CIC Library Directors, for the opportunity to consider these questions, and for their desire to lead discussion to identify principles and practices that facilitate improved collaboration across our institutions.

CONTEXT, ENGAGEMENT AND EMERGING THEMES

The CIC Library Directors have indicated a need for increased interplay between public services, resource sharing operations, and information technology units across the consortium to achieve greater harmonization of systems and services. Their overarching goal was to reduce fragmentation of effort and ensure decision-making processes that reflect the Directors' desire to align efforts where possible to meet broad CIC goals and objectives. A shared goal here is to create a coherent experience for our users by facilitating discovery to locally-owned material first, then by providing a seamless transition to resource sharing systems when necessary for fulfillment.

Using two primary lenses, those being *the public service/patron experience* and *business processes/efficiencies*, the project team identified two overarching questions in response to the challenge:

1. How might an examination of discovery and resource sharing planning and decision-making processes help us identify/determine solutions and approaches for greater coherence and efficiency?
2. What is the potential for common solutions and/or greater integration with respect to resource sharing services and supporting architectures within the CIC?

In order to address the questions above, the project team engaged primary stakeholders in an effort to understand their local practices, challenges, and desires with respect to discovery and resource sharing at their libraries. The goal of these engagements was to uncover shared challenges in providing resource sharing services for users, both for individual libraries and across the consortium. *A general consensus was that discovery-to-fulfillment processes, with respect to resource sharing, is unclear, if not unexpectedly complex to users, and that any effort to develop a more coherent set of practices and/or solutions to simplify respective discovery and resource sharing environments will be welcomed by users and staff assisting them.*

Engagement 1: Survey of the ILL Directors

In September, the project team conducted an online survey of the CIC ILL Directors (Appendix A: CIC ILL Directors Survey: Resource Sharing Environmental Scan, September 2012) inquiring whether/which discovery systems are in place or under consideration in their library, how their resource sharing systems are integrated with discovery systems, which stakeholders were involved in the selection and implementation of these systems, and if the libraries participate in consortial resource sharing. Not surprisingly, there are several web-scale discovery systems in use across the CIC including Primo, Summon, WorldCat Local, and locally developed systems. However, *the integration of discovery and resource sharing systems was found to be complex, superficial, and limited.* When selecting discovery and resource sharing systems within their respective libraries, most had task forces or groups with broad library representation. A number of libraries responding to the survey belong to more than one resource sharing consortia including university system, statewide, or other regional

consortia. The ILL Resource Sharing Management software (ILLiad), a product of Atlas Systems and distributed exclusively through OCLC, is the most common software element in CIC interlibrary loan operations.

Engagement 2: CIC Resource Sharing Symposium

In October 2012, the project team was invited to attend the CIC Resource Sharing Symposium in Chicago. The team summarized their charge, presented the results of the CIC ILL Directors' survey, and led a discussion addressing the primary questions under consideration for this report. Participants were asked to think aspirationally about the "ideal" discovery-to-fulfillment resource sharing environment. The session was contextualized as a need to explore stakeholder understanding (and desires) in light of the interplay between traditional operational functions and a consideration of consortial-level solutions related not only to technology and architecture, but also to organization, processes, and governance.

This particular engagement proved to be quite informative on a number of fronts, particularly in discussions on the results and themes that emerged from the survey of the ILL directors. During the Q&A period, and through informal exchanges with colleagues throughout the symposium, the team was able to clarify and affirm their understanding of the emerging themes, and also able to develop a more cohesive and shared understanding of the complexity of operations, pressures, constraints, and nuanced decision-making that goes into providing resource sharing services to users. Perhaps most important, the meeting served as a true affirmation of our collective intent (as institutions and as librarians) to provide the best user experience possible given the challenges posed by available resources and constraints.

Engagement 3: Survey of the CIC Public Service Directors

In October, the project team initiated an online survey of the CIC Public Service Directors (Appendix B: CIC Resource Sharing Environmental Scan – Discovery Service, October 2012), exploring questions pertaining to their perceptions as to how their libraries have integrated their discovery and resource sharing systems, their sense of user expectations with respect to discovery-to-fulfillment, the preferred (or acceptable) number of interfaces/systems a user must navigate to move from discovery-to-fulfillment, preferred methods for making fulfillment options or parameters apparent to users, and instructional materials or sessions offered by the libraries for discovery and resource sharing. *Respondents indicated that users want a seamless interface, without redirects, between discovery and fulfillment.* Some noted that current systems can take up to five "clicks" through pages from discovery-to-fulfillment, and that ideally the system would determine the optimal path for fulfillment and take care of that for the user, or would present the user with fulfillment options.

Emerging Themes: Preliminary Report to the CIC Library Directors and Stakeholder

Feedback In November 2012 the project team prepared a preliminary report for the Library Directors. In January 2013, a copy of the report was posted online, inviting comment from the stakeholder groups who had contributed to the earlier surveys. The objective in seeking comments was to ensure that the project team accurately reflected the range of opinions and issues that emerged from the stakeholder engagements and to gain an understanding of the interconnectedness of these groups when considering services that clear to users and cost-effective to operations.

Not surprisingly, the report recognized a fairly clear consensus, particularly from the Public Service Directors, that in the activities of searching and then getting needed information getting users are confused. This is due in large part to the number and diversity of systems and options now available to them. In general, the Public Service Directors sense that users would welcome greater consistency and/or ease with respect to navigating our discovery and resource sharing systems. *There is a strong sense that the ideal situation, if not growing expectation, would be to have users remain in a single interface from the point of discovery through fulfillment.*

In summary, the following specific themes emerged from the various stakeholder engagements and reaction to the Preliminary Report:

- The concept of “one-stop shopping” is attractive to users, as well as staff supporting them. *Discovery* and *fulfillment* presented as two separate, disconnected, or different things, perhaps even in two distinct places, is confusing to users and staff alike. Users are expecting a seamless and continuous transaction. Anything less is disappointing.
- There are too many product/service options asserted within the user interface. How can this be reduced? Is it possible to improve the explanation of these services or, perhaps more effectively, not let back office complexities drive end-user interfaces and workflows.
- Some complexities will be difficult to conceal from users. Is it possible to clarify for users the distinction between “returnables” and copies (non-returnable) when there is growing expectation for ubiquitous electronic copy? Is it possible to clarify for users what is available immediately (electronically), at the local library (requiring some delay with user or staff time needed to retrieve the item), or from another library (taking at least a few days). Where do new and often idiosyncratic delivery formats, like e-books, fit into this array of delivery options?
- There is interest among some staff and possibly with users whereby searches in discovery systems may be “tuned” or “scoped” to filter on availability/fulfillment parameters. It is worth considering that the ability to do such tuning might logically be extended to our resource sharing systems (e.g., whether at the point of discovery or the placement of a request, might there be ways to present options that have been predefined by users based on parameters such as turnaround time, length of loan

period, possible option to purchase, etc.).

- Communication to the user is a critical service element. As users cross into various institutional service environments, can there be common and user-friendly nomenclature in the “ILL/resource sharing” and other service realms?

In overall reflection of the issues, the UBorrow project and resource sharing in general, it became apparent that *while each CIC library explores technology and service implementations at a local level, it is increasingly important for each to weigh options within the consortial context.*

Recognizing the need for local review and principles, optimal outcomes from CIC may depend on local strategies aligning with consortial strategies towards the continued improvement areas of our various discovery-to-fulfillment services. While local decisions may advance or address particular goals of a single institution (e.g., cost savings, institutional principles), such decisions are rarely without service implications or financial consequences for CIC partners.

A POSSIBLE CIC FRAMEWORK FOR DISCOVERY-TO-FULFILLMENT PLANNING

Following the release of the preliminary report, the project team turned its focus towards developing a response. While the emerging themes and issues were not surprising, the problem space to be addressed was found to be highly complex. The intersection of institutional and consortial decision-making processes regarding services and technologies in this area is a matter of intricate governance. Raising the awareness level of functional and inter-institutional interdependencies *and* effects in our decision-making processes seems necessary. To do so, it is deemed important to foster a common understanding of interconnected service spheres like discovery and fulfillment as a kind of ecosystem -- of users, staff, systems, practices, policies, and institutional philosophies.

To advance this notion, the project team determined that a potentially useful course of action would be to develop a framework that CIC institutions and colleagues might find useful in addressing both institutional and consortial needs and interests. Up front, it's important to acknowledge that the CIC institutions strongly share a general commonality of mission, service intent, and broad strategic direction. The CIC libraries have a deeply-rooted service orientation and ethic, coupled with a commitment to providing high quality information resources to its academic communities. Viewing the totality of resource sharing as an ecosystem intends to facilitate greater understanding of the interdependencies in play as libraries work to create discovery and resource sharing environments that meet the needs and expectations of library users.

A Resource Sharing Ecosystem

Highly effective resource sharing services first depends on a clearer and shared sense of the total environment by the CIC's libraries, decision-makers, and staff. In addition to our staff and users, there are three primary functional components making up a resource sharing ecosystem: they are, discovery, fulfillment, and technology. Each of these components can be viewed as functioning independently *and* interdependently within the environment. Each faces pressures to perform with

operational excellence (smart, cost-effective, efficient operations) while upholding high *quality of service* standards (fast, accurate) to meet the ever-rising expectations of users.

1 - Discovery Layer

The literature and our direct experience with patrons tell us a number of things about the discovery needs of users. Library users seek a clear starting point for finding resources relevant to their research. They also want a single interface to easily search and access everything, and expect discovery and fulfillment services to coincide within this interface. Currently, libraries present a myriad of discovery options to users ranging from web-scale products to aggregator databases, the library catalog, collections lists, and resource sharing catalogs. This confusing environment leads many users to ultimately place an interlibrary loan request for locally-owned material. One improvement, however, has been in the use of web-scale products promoted as a research starting point to facilitate discovery of library resources first. Penn State Interlibrary Loan experienced the impact of their new web-scale discovery service by seeing a 35% reduction in the number of undergraduate requests for locally owned material in the year following the implementation.

While users uncover an abundance of material in web-scale discovery products, some do come to a “dead end” with their particular search terms. These products do not include all of the library’s resources, nor provide a transition to continue the search in a resource sharing catalog. To complicate this further, when a resource sharing product not intended to be the library’s initial entry for discovery has its own public discovery interface, it may not be clear to users when and why to use it. Prompting the CIC Library Directors to request this review and report were reflections on the CIC implementation of UBorrow (Relais) to support unmediated resource-sharing requests. As noted in a recently released report, the UBorrow service has achieved many successes, most notably those resulting in new efficiencies for users and resource-sharing staff. Yet, presenting UBorrow -- primarily a fulfillment service -- to users as a discovery tool has raised a dilemma. On the one hand, it neatly moves closer to the ideal of seamlessness between discovery and fulfillment functions for the user. On the other hand, UBorrow does not rise to meet the new standard of (and user expectations for) web-scale search and discovery services.

2- Fulfillment (ILL/Resource Sharing/Document Delivery Services) Layer

Interlibrary loan (ILL) services, operations and systems are, by their nature, multidimensional and complex; they function within a library environment of discovery and fulfillment silos. Furthermore, interlibrary loan units are expanding services beyond traditional ILL, such as campus book and article delivery, distance education delivery services, e-books, and patron-driven acquisition services. They have (at least) three major compounding dimensions of interconnectedness:

The cross-functional dependencies within the institution. Interlibrary loan collaborates with many library departments to support services. Library IT manages authentication, openURL, Z39.50 protocols, and system connection issues; resolves ILL’s unique hardware and software issues; assists in the setup of

systems, services, and system interface configurations; and maintains and supports in-house e-resource management staff on negotiating favorable licensing terms, and with rights management staff for securing third-party permissions. ILL and Circulation join to check out resource sharing material and manage bills for lost ILL material. ILL supplies lists of request information to assist library selectors. Finally, ILL regularly interacts and plans with local shipping/logistics operations to ensure timely receipt and delivery of physical items.

Service and system dependencies across the CIC institutions. Interlibrary loan units across the CIC libraries have aspects of uniqueness, which manifest in institutionally-specific requirements, resource commitments, technologies, programs, and library resources (staffing and funding). CIC libraries are committed to adherence to information exchange standards. In ILL, the core standards are defined in the CIC Resource Sharing Agreement (Appendix C) which includes a commitment to respond as quickly as possible to requests, and the use of delivery for articles and courier delivery for returnables for expedited delivery. Nearly all CIC libraries use OCLC WorldCat and the ILLiad ILL management tool for fulfillment. Nonetheless, not all use other CIC libraries as a first choice. Those with statewide commitments rely on those networks first; nine libraries use the CIC UBBorrow; and less than half of the CICs use RapidILL, a product that automatically sends article requests to RapidILL participants first. *Dependencies on vendors and other externalities.* These dependencies influence the operational and technological environment, now and moving forward. For process efficiencies, resource sharing units are looking beyond the traditional WorldCat catalog to proprietary products that offer specialized services.

For example, UBBorrow interfaces directly with CIC libraries' catalogs and then, according to system configuration, chooses a lending library based on item availability, request load leveling, and the library's loan policies.

Since the system is configured to send the request to a library that indicates the item is available, 90% of the requests are filled by the first lending library, (Footnote ---Report to CIC Library Directors. *UBorrow: One Year Later*. Anne Beaubien and David Larsen. April 17, 2013).

Another example is RapidILL (and similarly the Knowledge Base service from OCLC), a union catalog of both print and electronic journal holdings of member libraries. It returns requests that the participating library owns or immediately sends a request to a library holding the needed journal issue. These products, however, may simplify some processes while complicating others, mainly due to limited systems integration. During a routine processing day, ILL operations interface with multiple ILL/resource sharing service products (e.g., Penn State has six), each subject to different policies, consortial agreements, or unique processing protocols or efficiencies. These decisions must be balanced by a nuanced understanding of the product's functionality and the level of

interoperability with local web-scale and database products, the ILS, ILL management system, or other resource sharing products.

3- Technology Layer

At both the local level and across the CIC, there are many technical systems that underlay the patron experience with respect to discovery and fulfillment. These systems are necessarily optimized and configured to integrate with systems and vendors in play at a given institution, and subsequently configured to integrate with consortium partners to the best of the library's ability once local needs have been addressed. *Given the range of local practices, vendors, licenses, and systems in play, there are significant technical challenges associated with realizing the idealized state of seamless resource sharing experience across the CIC.*

GOALS AND RECOMMENDATIONS

The project team proposes that the CIC develop a framework to address highly interdependent needs and interests in the areas of discovery and fulfillment services, but potentially elsewhere as well. In advancing the notion that our institutional and consortial functions as increasingly part of a single ecosystem, such a framework would strive to foster planning and decision-making outcomes that are conscious of the whole. Within this project's focus, approaching the totality of discovery and fulfillment (via resources sharing) would facilitate greater awareness and understanding of the interconnected service components and functions, while striving to meet the needs and expectations of library users.

The goals of establishing this framework and the recommendations to meet them are to:

1. Develop clear governance and decision-making processes in areas of high interdependency. In highly interdependent operational areas in the CIC (e.g., resource sharing), develop well-understood processes for exploring options, planning, decision-making, and execution. Apply “systems” approaches and safeguard against unilateral actions or commitments that constrain collective action. The goal in mounting functionally-interconnected services is that they are richly responsive to the needs and intentions of each institution, as well as to the consortium.

Recommendation:

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Elements of a standardized process may include articulation of:

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2. Support cross-functional planning and information exchange. Strengthen the exchange of ideas and institutional planning information across the consortium (across libraries and among diverse functional stakeholders within each library) relating to discovery-to-fulfillment systems' ecosystem, integration, and support of service operations, with the creation of a more coherent user experience foremost in mind.

Recommendation:

Establish a small joint subcommittee (3-6 members) of representatives from the CIC committees in the functional areas of resource-sharing, public services, and technology with an initial two-year commitment, charged to oversee integrative coordination within the consortium related to services areas where there is a high level of functional *and* institutional interdependency.

Questions to Consider

- What might be done to ensure a smooth transition between discovery and delivery?
- What might we do to hide numerous, disparate systems from the user?
- What should be the predominant drivers as libraries explore new systems, technologies, practices?
- If tradeoffs must be made with respect to improving the user experience, which factors should be given greater consideration?
- Does fulfillment come at expense of discovery?
- Does technical integration come at the expense of both?
- If, as Lorcan Dempsey asserts, “discovery happens elsewhere” or at least substantially elsewhere, how do we position our fulfillment services to achieve the seamless experience between “search” and “get it” that users expect?

3. Model an open architectural model for CIC discovery-to-fulfillment systems.

Develop an open architecture model for discovery-to-fulfillment systems for the CIC.

The model, to be conceived of at an abstracted level, would take into consideration the rapidly evolving changes in information discovery environment, variety of specific solutions in use, the discrete role of specific architectural components, the roles of standards, APIs, resolution, and data services to achieve *full* interoperability across our diverse technology environments. The model would serve as educational and planning vehicle, helping to establish a common understanding of and guideline for such interoperability moving forward.

Recommendation:

Commission an independent analyst to review the overall CIC discovery-to-fulfillment system environment and submit recommendations for maximizing interoperability and complementary use of diverse technologies and systems across the CIC. The model would be presented to the relevant CIC committees and early-referenced joint subcommittee for review, dissemination, and potential action.

4. Strengthen efforts to exert collective influence. Exercise intentional collective influence on external entities (i.e., software and system vendors, publishers and content-providers, standards-creating bodies, policymakers, etc.) that will, in turn, influence the direction and capabilities of discovery-to-fulfillment services moving forward.

Recommendation:

- Strengthen coordinated efforts to identify, prioritize, and communicate CIC requirements of these systems and services to external entities of influence. In areas of critical need or opportunity, engage the Directors in exploring options for collective executive action.
- Continue collaborative work with vendors, such as Relais, the UBBorrow Service vendor, and other consortia who share the CIC’s interest in the development of standards-based open architectures and robust APIs that will, ultimately, enable highly functional discovery-fulfillment system integrations

CONCLUSION

In conclusion, the project team offers these recommendations in the spirit in which it received the assignment; that is to say, a spirit of sincere desire on the part of the Directors to understand the interplay and intersection of the systems, services, and staff comprising modern resource discovery to fulfillment services. Based on input from the Directors and a variety of stakeholder engagements, the project team elected to focus its recommendations on collaboration aimed at enhancing our ability to work together, and individually, in ways that leverage our collective ability to communicate, plan, and provide the high quality research, teaching, and learning services our users expect and value, and on which they depend for their work. A primary goal, then, is the creation of a coherent experience for our users by facilitating discovery to locally-owned material first, then by providing a seamless transition to resource sharing systems when necessary for fulfillment.

While the project team has worked diligently to constrain its thinking and recommendations to a particular subset of library services, the project team submits that there may be other projects, services, or areas of focus that would benefit from a "systems" approach to planning and decision-making, using such a framework or model from the earliest stages of development. In these times of shrinking budgets, demand for efficiencies, desire for innovation, and staff reductions, it stands to reason that now, more than ever, the CIC Libraries will need to embrace and build upon their long-standing commitment to collaboration and the "common good" for our user communities.

The Directors should be heartened to know that the stakeholders who engaged in this exercise were unanimous in their desire to improve the user experience. The project team believes that improving the user experience can only be achieved through greater coherence in our planning, vetting, and decision-making processes. To this end, the project team urges the Directors give these recommendations serious consideration and to work together to build out and implement those that resonate with your collective thinking as to how to leverage the collective strengths and resources of the CIC libraries. The project team can confidently attest to the fact that despite any lack of coherence around the planning and execution of any given project to date, the spirit of collaboration is most assuredly alive and well in the CIC Libraries. The members of the project team are willing and able to assist in taking up any and/or all of the recommendations set forth in this report.

Appendix A: CIC ILL Directors Survey: CIC Resource Sharing Environmental Scan, September 2012

Survey Responses

Does your library have a discovery service (other than the catalog) for your users? A discovery service searches across library content and collections to retrieve and display search results from books, journal articles, digital resources (e.g. Summon, Primo, WorldCat).

Responses: Yes: 12 No: 1

What discovery service are you using? Please feel free to explain your current library discovery environment.

- While we still provide access to our Voyager Classic catalog, we also provide Primo as a discovery tool for our content/resources.
- Primo
- Forward (created in-house) and Primo
- WorldCat Local
- Summon Service from Serials Solutions
- Primo
- Summons (we call it Articles Plus)World CatMLibrary Search goes across Articles Plus, databases, Mirlyn (our online catalog), online journals, research guides, and library webpages
- Ebsco Discovery Service
- III Encore, WorldCat (though our IT director doesn't consider this a discovery tool)
- Easy Search (home built system supported by grants and our Engineering Librarian); World Cat; getting ready to implement Primo; SFX
- UMN's answer to Q1 is actually 'yes' and 'no.' We implemented Primo in 2007 after having been a software development partner with Ex Libris for approximately two years. We continue to run Primo to date, but have not expanded the search index much beyond UMN catalog data. In other words, UMN's Primo has largely served as a contemporary interface and front end to the UMN ILS.
- Encore (Innovative) - this program does not bring up a complete listing but it does add another layer of discovery.
- We currently use AquaBrowser and Ebsco Discovery Service, but are planning to replace AquaBroswer with VuFind.

If you currently don't have a discovery service, are you considering getting one? Please feel free to comment on your progress (Are you in the beginning phase of research, actively pursuing, or implementation phase?) or on the discovery services you investigated.

- We are trying to implement Primo
- We are in the final stages of negotiations with a vendor for cloud-based discovery system that will interoperate with Alma (UMN is an Early Adopter, with implementation scheduled for late CY2013) and eliminate the need for an OPAC interface (supporting transactional function) in addition to webscale discovery services. The vendor was identified as a result of an RFQI process.
- We have looked at other products over the years.
- We are currently implementing VuFind as it gives us the option to configure the discovery interface to meet needs identified during focus groups with users and analysis of usability testing and feedback on current systems. This is the discovery service we plan to implement with Kuali OLE when we migrate to that integrated library service later this fiscal year.

Are there any links from your discovery service to your resource sharing services? If so, please list which resource sharing services are linked, and please include a basic technical description or an example of how the services are technically integrated.

- The integration is superficial at this point and UBBorrow and ILL are offered as options on the request pages in our Voyager Classic catalog. Because we have not adopted Tomcat - we were unable to integrate them in a more seamless way. Our request options are limited in Primo as we have not applied a particular patch that overcomes the issues we have had so we have not been able to better integrate there. Hopefully this will be addressed soon. We do, of course, provide ILL as an option through the SFX menu that is revealed in both the catalog and Primo.

- Yes, we have SFX (which can push users to our interlibrary loan and our local document delivery service). We also have a message (Didn't find the books you were looking for? Try UBorrow.) with a link to UBorrow.
- UW System search, on-campus book retrieval, and ILL.
- When a patron searches WorldCat Local, it simultaneously searches our local catalog, our statewide OhioLINK catalog, WorldCat, and 15+ databases (customizable) through a single search box. Limiting is possible from the search results screen. For articles, we have turned on our subscribed collections in the OCLC Knowledge Base so our WorldCat Local users receive direct links to the full text article. For books, users can see availability in WorldCat Local and place holds in both our local and OhioLINK catalogs. If a title is not locally available, a 'Request through Interlibrary Loan' button appears so that the user can request through their ILLiad account (where the form is pre-populated for them). About 75% of all our ILL borrowing loan requests originate from WorldCat Local.
- The Get It link for articles has a consider Interlibrary Loan link with an open url link to ILLiad. In addition, for some records, there is a Request button on the record screen which is an open url link to ILLiad. For books owned by Penn State, there is a link to our catalog. If the item is checked out to another library, there is a link with the message, This copy unavailable, submit request via Interlibrary Loan which goes to the ILL homepage with E-ZBorrow, UBorrow, WorldCat, and ILLiad options
- There are links to ILLiad through our OpenURL resolver (SFX). We also use a tile in Primo to link users to their query within UBorrow (Didn't Find What You Were Looking For? Try UBorrow)
- WorldCat is linked. There is a MGetIt button next to the item in Mirlyn, for ILL that when clicked pre-populates a request form in ILLiad. Our databases also have a MGetIt button that pre-populates ILLiad for local document delivery and we if don't own it doc del refers to ILL. We are in the process of having MGetIt smart enough to pre-populate ILLiad in ILL when appropriate.
- Yes - for each citation we provide a link to IU-Link (our OpenURL resolver) and to ILLiad. This is set up using EBSCOAdmin custom linking which has logic to determine when links appear (ie if there is not full text available/already linked to citation/record)
- Pdfs are included, and WebBridge (link resolver) is used to link to the ILLiad system. III API for the catalog is updated hourly; article discovery is more dynamic - databases are searched with a real time query (API) and harvested with an OAI
- SFX to ILLiad to request an item not in full text or owned; and World Cat to ILLiad for loans not owned.
- Borrowing: In addition to the ILLiad web forms for users to initiate ILL requests, they can also request materials through the following links:
 - * WorldCat: a link to Interlibrary Loan/ILLiad is available on the title level record. The link takes the user to ILLiad where they can click the submit button once they are logged in.
 - * SFX enabled databases: links to interlibrary loan services are provided if the material is not available full text. ILL is an option even if there is a print record because the item may be in use or the issue may not be owned. The link takes the user to ILLiad where they can click the submit button once they are logged in.
 - * UBorrow: while Minnesota is not a member library, ILL borrowing staff can search UBorrow by clicking a link within ILLiad. To do so, we mirror a member library (we act as if we are Penn State due to geographic distance) and if the mirrored library does not hold an available copy, staff can quickly submit an ILL request that contains the shelf location of the copy found to be available within the CIC.
 - * Get It service: offered as part of the Ex Libris Aleph catalog - users are able to request paging of all materials that circulate for a minimum of one week. This includes materials on our Twin Cities, Duluth, Morris and Crookston campuses. Users are able to select their preferred delivery or pick up location. Once logged into their library account, users click the Get It link and input their pick up preferences. Paging slips print at the appropriate location.
 - * MnLINK Gateway -- Z39.50 interface into the catalogs of Minnesota libraries including the UM collections. Users place requests that are routed based on holdings and availability. Minitex staff process requests that are filled by the UM collection or other locations on the system.
 - * Aleph ILL is used by Minitex to interact with the Crookston and Morris campuses of the UM. We also use it to send and receive requests from libraries in North Dakota and South Dakota. The system uses ISO ILL for this interactions between server sites.
 - * UBorrow requests are received on the ILLiad system and contain shelf location for items held at the UM.
- If the patron finds something that MSU does not own and they are using Encore, they can select a link that takes the to WebBridge and this links them to searching our catalog and requesting interlibrary loan.
- We have several targeted links from our AquaBrowser. One link is to UBorrow, which is displayed as an alternative to recalling when a title is unavailable. Another link is to Scan & Deliver, a document delivery service, that displays when a title is available in the library. We also include links to our SFX OpenURL resolver in AquaBrowser, WorldCat, and our Ebsco Delivery Service; the SFX menu includes links to fulfillment options that include interlibrary loan, UBorrow, and our Scan & Deliver document delivery service. We also have a search box on the Library home page that allows direct searching of Worldcat, local online catalogs, Ebsco Delivery Service, and UBorrow.

Please describe the library units/stakeholders involved in the decision to purchase, the implementation of the discovery service, and the set up for the resource sharing integration.

- We have a set of enterprise systems operational groups and an overarching Enterprise Systems Coordinating Committee in the library and all would be involved in some level of such an initiative - with much involvement from Access Services and Resource Discovery Operations Groups. There would also need to be great buy in from our Library Technology Division and their priorities and support from the administration. If this were supported by the CIC - that would be a plus, I should think.
- A task force was created to evaluate the user interfaces of all the different discovery services. The task force represented all areas of the libraries, although very heavy in public services. The administrative group gave the final approval for the recommendation of Primo. Since we were already using Primo, the switch to Primo Central was very simple and done by our technical staff. Likewise, we already used SFX so that was already implemented.
- Library Admin, ILL, Collection, Technology
- OSU partnered with OCLC to be a pilot library of WorldCat Local in 2008. The pilot was approved by the OSU Libraries' administration and led by our Technical Services/IT associate director at the time. Eventual implementation team members included persons in our catalog systems support, ILL, special collections cataloging, user services, etc. WorldCat Local (rebranded locally as 'WorldCat@OSU') became our default discovery tool on the OSU Libraries home page (pushing our local catalog to a back page) in June 2011. Resource sharing integration was made easy through WorldCat Local's ability to accommodate an OpenURL resolver and connect to ILLiad. Current management of WorldCat Local as our discovery tool is tasked to our Discovery Systems Management Working Group (see: <http://library.osu.edu/staff/administration-reports/DSMWorkingGroup.docx>)
- For the investigation and implementation of Summon, all library units were represented, from public services, to technical, to tech and access services, and campus libraries. Plus there was opportunity for staff to offer feedback. ILL was consulted about having the open url link from within Summon.
- The decision to investigate was made jointly by the Libraries' Operations and Information Resources Councils, investigated by a Libraries-wide task force and implemented by a TF that included IT, User Experience, Tech Services, and Public Services reps.
- AUL for technology to whom head of Systems reports, AUL for Collections to whom ILL reports, The Public Access Resources Committee (PARC)
- The decision to purchase EDS was made by library administration with input from public services and other staff. During implementation, our Digital User Experience (website & discovery) department took the lead, consulting with other units as appropriate, including Reference, Teaching & Learning, Library Electronic Resources Acquisition, and Document Delivery Services. The set-up for resource sharing integration was fairly straightforward as EDS was immediately enabled with settings previously applied to other Ebsco products.
- Library Admin - primary decision maker/purchaser. Computer operations and technical services both worked on implementation. UNL Ctr for Digital Research in the Humanities worked/works on harvesting data.
- ILL/DD; IT; Reference; Library Admin. (I answered no on #5 because I don't have access to these things and our IT department will not assist in this).
- A highly representative task force was charged to investigate discovery system options, produce requirements in support of a rigorous procurement process (initially an RFP, then revised to an RFQI), evaluate responses, and make a recommendation. This followed a series of studies conducted by the Libraries and shared extensively internally (with Libraries staff and the faculty Senate Library Committee) and externally (in white papers and conference presentations). Advancements in discovery services were highlighted to campus in the Libraries Strategic Plan. The decision to purchase was made by Libraries leadership. Since we are still in negotiations for the system, implementation and configuration for resource sharing services have not yet occurred. We expect that design to be informed by perspectives of both end users (via public services staff) and resourcing sharing operations staff (ILL).
- Technical Services, Public Services, InterLibrary Services. Product was purchased by Technical Services. Resource sharing option was part of WebBridge set-up so integration was automatic.
- The evaluation and implementation of Ebsco Discovery Service was a project initiated and owned by our Collections Division, aiming to improve exposure of licenses electronic resources. The project team was chaired by the Library's Web Program Director from the Digital Services Division. Representatives from many departments were involved in this evaluation, including reference librarians, bibliographers, catalogers, electronic resources staff, and systems staff. Access services staff advised on the resource sharing integration in this discovery tool. The implementation of VuFind is being handled similarly to that of Ebsco Discovery Service, again with the Web Program Director as chair of an implementation team comprised of representatives from the three major library divisions (User Services, Collections Services, Digital Services). Opportunities for input will be provided to many library departments, and there are standing groups that advise on the user experience aspects of the tool, and on the representation of collections in the new catalog. We may refine presentation of document sharing options incrementally in the new discovery catalog, but the presentation will likely remain conceptually similar to previous catalog implementations. Resource sharing services will be displayed to the user conditionally in contexts where they are relevant.

Appendix B: CIC Public Service Directors: Resource Sharing Environmental Scan on Discovery Service October 2012

Do you find the integration of your library's discovery service and the resource sharing/interlibrary loan options acceptable or confusing? Please explain.

- Because discovery is typically a separate interface from requesting materials I feel that the user experience can and probably should be improved.
- We do not currently have a discovery service. Integration of our catalog and the various ILL options are VERY confusing to patrons. We are currently running 4 different ILL systems-- ILLiad, MeL, ArticleReach and UBorrow. MeL, the Michigan E-Library is vastly preferred by our patrons because once there is a failed catalog search, the patron clicks on the 'get this for me' button, they enter their ID # and the request has been submitted.
- I think it's confusing. The integration happens via OpenURL resolver, which is hidden and non-obvious to many of our users.
- We currently don't integrate resource sharing/ill options in the implementation of EDS (Ebsco) aside from SFX links in EDS.
- It's much improved! The library's discovery service has good integration with sharing options for intra-campus and system inter-campus. Further afield, it's confusing for patrons to know where to log-in to ask for what.
- Acceptable. OSU uses OCLC's WorldCatLocal as its discovery tool and has rebranded it locally as WorldCat@OSU. Search results in WorldCat@OSU display holdings at three levels: local (OSU), consortial (OhioLINK), and global (WorldCat). Users can directly request available physical copies at OSU and in OhioLINK from the WorldCat@OSU interface. A link to ILLiad for ILL requesting only appears when no OSU or OhioLINK copies are available. Users receive direct links to our licensed ejournal articles and ebooks because our holdings have been set in the OCLC Knowledge Base. A direct link to ILLiad also appears in WorldCat@OSU records for requesting articles or book chapters that are not available online.
- I like that the option for ILL appears on the results page when a search returns zero items. I believe the option could be more prominently placed.
- Confusing. Multiple interfaces, library jargon, multiple clicks all make the transition to from one system to another very confusing.
- I think it has been acceptable

What do your users expect from a discovery service?

- They expect to find full-text information and e-books and they most likely would expect one click requesting for items that are not available fulltext.
- One-stop shopping. They don't want to have to know which index to use.
- We recently completed a user study, and found that it is difficult to characterize user expectations of a discovery service. Our users do not have a well-defined mental model of the discovery service, and expect it to return not only results from Libraries collections but also about the Libraries when they search (i.e., not only articles but also hours, directory information, etc.)
- They are looking for a way to discovery and access everything that is available to them via a single interface.
- Easy way to find everything! Also, to request everything from within the same service.
- Ease of searching, finding, accessing, and requesting, with little effort, and with delivery in the shortest time possible. Users also expect to have the ability to uncover collections available locally as well as worldwide.
- Some want the service to show them things we own or subscribe to, for which access is fairly quick and easy. Others want to know what's available broadly and then want an easy way to request items. I believe that more people will want the latter, as we go forward.
- They expect to find things easily and quickly, irregardless of the vendor that's providing the resource.
- I think they expect the service to tell them what we have, if it's available, and if we do not have it how we might get it for them. On the other hand, I'm not sure the phrase 'discovery service' means much to the average user.

On the average, how many 'clicks/redirects/webpages' must a user go through from a discovery service to submit a request in a resource sharing or interlibrary loan system? What do you think is a reasonable number of 'clicks/redirects' between the discovery service and placing a request?

- ideally one, maximum 2
- We don't currently have a discovery service, but users will expect two clicks to be consistent with our easy-to-use MeL system. MeL is the Michigan E-Library, a system run by the Inn-Reach software.

- Assuming they choose the right path, it takes 3 steps to get into the resource sharing system. They would go from Primo to SFX, then from SFX to ILLiad, and finally authenticate to ILLiad. I think that three steps probably isn't unreasonable (including authentication), but fewer would be better.
- By using a SFX link attached to a record display in EDS: Click on SFXChoose ILL or UborrowLog into ILLiadSubmit prepopulated request4 clicks. The number of clicks may not be as problematic as the SFX link displaying in the EDS. We use a button labeled Find It. Our patrons may not understand the all of the options available by selecting that button (searching the catalog, finding full text, submitting ILL or UBorrow, exporting the citation, or even finding similar article, or even information about the journal).
- Depends! If in Worldcat, 3 clicks to login, once logged-in a request takes 2 clicks. However, an online index may have no direct link to ILL system. So, have to find ILL page, click, login, fill out info by copying & pasting, then click. Patrons don't find this reasonable.
- From a WorldCatLocal record for a work, only three clicks are needed to make an initial request: One click from the WorldCatLocal record to get to the ILLiad OpenURL logon page. One click to get to the prepopulated ILLiad request form. One click to submit the request. Subsequent requests require only two clicks since a cookie remembers their ILLiad login info.
- Three clicks to get to a form, and then the form must be filled in. One click to signal desire is optimum.
- Between 3-5 clicks depending on the format and the source. Ideally, this would be cut down to 1-2 clicks.
- 4; I would like to see it down to 3

Would you like your users to stay in the same interface as the discovery system to submit their resource sharing/interlibrary loan request rather than being transported to the resource sharing/interlibrary loan interface? Please comment.

- I do want users to be able to stay within the system or at the very least have easy access back to the system
- Absolutely. The goal is to have fewer clicks and prepopulated request forms.
- Yes. This could be less disruptive to the user (workflow, adjusting to different interfaces, etc.)
- Staying in the discovery service is desirable if it would be possible for the patron to authenticate and select which resource sharing service.
- As long as interface is seamless, doesn't matter.
- Yes. WorldCatLocal allows users to submit loan requests for local and OhioLINK titles directly from the discovery interface and embeds access to their ILLiad account with a prepopulated request form for easy requesting.
- I would like the system to know what the user was looking for and take them directly to the appropriate form, with information already entered retained. They can then fill in the rest of needed info. Whatever happens behind the scenes should be unknown to the user. Their experience should be simple and painless.
- Yes, this would be ideal. The process should be seamless for the user and similarity between interfaces would help this transition.
- yes; I think it would be less confusing and allow them to continue searching easier

What would be the ideal workflow for a user who starts in a discovery service but needs to use interlibrary loan to obtain an item?

- one click requesting for items that are not available fulltext
- We would like for there to be a single Request It link (like option 2 in question 7) that a user could click to make a request. There probably should be a confirm request step with a simple button.
- The ideal would be a single button (naming of the button is debatable) to authenticate the patron and place the request. The system would have to be in place to route the request to the best option for the patron (traditional ILL, UBorrow, and possibly BorrowDirect).
- Ideally, there's an obvious button to request item, clicking goes to ILL system, patron is prompted to login if not already and then taken to request form with bib information already filled in. Once request is submitted, patron is taken back to discovery service.
- Search results would display online, local, consortial, or worldwide content. An ILL request button would only appear if there was no immediate access to available online, local, or consortial content. If requested through ILL, the form should be filled out for the patron; this saves the patron time and results in more accurate citations. When the patron clicks 'Submit', the request goes out unmediated to potential lenders no matter what day or time the request is made.
- Described above. Perhaps the system could also take a stab at figuring out what the requested item is, searching against another database, and pre-populate a form, asking the user if this is the right item
- Ideally the discovery system would have users' credentials plus the information about the item and would pass that onto the ILL system, so a user would see a request form pre-populated and just be asked to review the info and submit.
- at the point at which it is determined we do not have something or it is not available then it should be clear on what steps to take if the user wants to pursue it

Do you find your library's resource sharing/interlibrary loan options easy to understand and use? What could be improved? Please explain.

- It could be improved by fewer steps within the same system interface
- Having 4 different systems that don't talk to each other is definitely not easy.
- Individually, they are easy enough to use but the problem is that there are too many options. We have UBorrow, regular ILL, document delivery, and other options that I'm probably forgetting. A user shouldn't have to worry about when to choose which option - they generally just want to request something and don't care how it comes.
 - It is not easy to understand as the library provides multiple options for resource sharing.<http://www.lib.uchicago.edu/e/using/ill/> By providing self selecting option, the decision process is not simple.
 - It's confusing to patrons as some items may be requested directly in library discovery system, some other indexes/databases have link to ILL built in and then for other wanted items must go direct to ILL system. I'm not sure this could ever be successfully merged.
 - WorldCatLocal makes discovery and ILL requesting easier. Because users are discovering much more worldwide content, they are now making more ILL requests. At the start of FY2012, WorldCatLocal replaced our local OSU catalog as the default discovery interface on our library's main home page. This change led to an 81% increase in the number of ILL loan requests made compared to the previous fiscal year. Also, only 42% of our users' ILL loan requests originated from WorldCatLocal in FY2011, but were 73% of all loan requests made in FY2012. Because discovery and ILL requesting is easier, users are also finding and requesting more difficult to obtain materials (e.g. titles that are not yet published; only available overseas; held in non-circulating reference or special collections; textbooks, etc.). The number of ILL loan requests needing to be cancelled jumped 181% from FY2011 to FY2012 and went from 29% to 45% of all loan requests received. Other issues:
 - Multiple or duplicate records in our consortial catalog result in users making unnecessary ILL requests for materials that could be directly paged from our statewide catalog system.
 - Users must keep track of items borrowed in two separate systems: their ILS library patron record for OSU and OhioLINK items and their ILLiad patron record for interlibrary loan items.
 - WorldCatLocal options are fairly intuitive, but when interpreting the link resolver it is not always clear where the material is located and how long it will take to receive.
 - From the Libraries homepage (outside of WorldCatLocal), users sometimes have difficulty finding the correct route for requesting material not owned locally.
 - It's fairly easy to understand, but requires a fair amount of input.
 - no, I find them confusing myself. I don't understand or stay up to date on the nuances of a particular borrowing system or consortia...I think we should just be able to request something and have the request 'automagically' be taken care of behind the scenes by someone who knows what they are doing!
 - I find it easy to understand and use;

What would you prefer? 1) A listing of resource sharing/interlibrary loan options for you to choose during the integration from a discovery service to placing a request. 2) A seamless 'behind the scenes' placing of a request ('I just want it and don't care where it comes from') with one click in a discovery system. Do you think these options would differ depending upon user status, such as undergrad or faculty? Please Comment.

- #2 is the preference and I do not think that the options would/should differ
- Seamless. I don't think the options should differ depending on user status. The library reserves the right to choose the preferred lender because of cost/efficiency considerations.
- Number 2 would generally be preferable. I suppose there could be graduate students or faculty who might prefer to choose method of delivery, but I think that UBorrow has helped with this greatly. The primary use case we had heard for wanting to select delivery method had to do with loan periods, which has been addressed in UBorrow.
- Option 2 would be preferable if a system would be in place to maximize the benefits of varying resources sharing agreement for the patron (and the library).
 - Patrons would certainly prefer option two. If this could accommodate different borrowing rules/limits of different patron categories, that would be ideal.
 - Option B is preferred if turnaround time is not a factor (i.e. the patron is willing to wait for the item no matter how long it takes). Option A, however, helps manage expectations by allowing users to see where an item is and then determine whether or not to make a request depending on when they need the item. Some users only want immediate online or local availability; others are willing to wait a few days for statewide or ILL borrowing. The ability to assess how soon an item may arrive influences the requestor's decision to make a request and lessens the possibility of items arriving later than was needed.
 - Again, different people will have different preferences, but I suspect the majority of users will prefer option 2. Some of the differences will be due to status, with faculty typically having a greater understanding of potential choices.
 - #2 for sure! I think everyone except for maybe librarians (but maybe only a few).
 - 2 and status should not make a difference. I think most people don't care where we get something just as long as we get it. I suppose there might be some grad students and/or faculty who do care but not many, in my opinion

How do you instruct users about your discovery service and resource sharing/interlibrary loan service? Please supply the url of webpages of your library instructional material.

We feel that we should not have to instruct users but we provide the following:<http://www.libraries.iub.edu/?pageId=7435>

Our discovery service is new and, to the best of my knowledge, we have not created instructional resources for accessing resource sharing services from it.

There is not a separate instruction webpage for the discover service. ILL guide is

<http://guides.lib.uchicago.edu/content.php?pid=340131&sid=2780672> Uborrow guide is

<http://guides.lib.uchicago.edu/uborrow> Choosing a service: <http://www.lib.uchicago.edu/e/using/ill/> Placing an ILL video tutorial:

<http://youtu.be/xZ0V7VhmZNg>

ILL has multiple pages under <http://library.wisc.edu/delivery/#account-logins> Discover service:

<http://www.library.wisc.edu/help/catalog/#default>

Course instruction is supported by our Teaching and Learning unit; one-on-one assistance is provided by our Reference and Research unit. Online instruction is available at: <http://liblearn.osu.edu/tutor/worldcatatosu/> Additional directions related to

Interlibrary Services are located at: <http://library.osu.edu/find/interlibrary-services/>

There is a tab for Services on the Library's home page and ILL is listed here. There is a library course page for every course on campus and many of these include information about ILL. It is taught in classes as appropriate to anticipated need. A search in the catalog with a zero return offers ILL as an option. <https://umn.illiad.oclc.org/illiad/logon.html>

My sense is that librarians may show the request process during course related instruction. All of our instructional materials on this subject to date are text-based: <https://www.libraries.psu.edu/psul/ill.html>

there are several tutorials at the bottom of the page <http://www.lib.uiowa.edu/services/illdd.html>

Appendix C: CIC Resource Sharing Agreement

Approved by the CIC ILL Directors on November 22, 2011

SCOPE

The CIC Libraries who participate in this agreement consent to give priority to CIC requests and share items from their collections at no charge and as broadly as possible. Restrictions on types of material available for lending should be kept to a minimum in keeping with the philosophy of openness that the CIC libraries value. CIC libraries are encouraged to use this program in whatever fashion they believe will provide the fastest, most effective service for their patrons.

- Certain types of materials (e.g. rare, fragile, non-print or otherwise non-circulating materials) might be lent through a negotiated process.
- Individual libraries may set limits on the number of volumes, reels, fiche etc., which may be sent to fulfill any one request.
- There is no limit to the number of requests a member library may submit.

A list of CIC participating libraries, resource sharing agreement policies and contact information may be found at:
CICResourceSharingMemberInstitutions

CHARGES

CIC Libraries agree to waive rush charges, overdue fines, and fees for photocopying of less than 75 pages. Photocopy requests for more than 75 pages or for special formats may be charged at the lender's discretion with notification to the requesting library when costs are above any limit specified by that requester. If expedited, overnight delivery is needed, the borrowing library will pay the associated costs. No fees pertaining to the replacement of lost materials or repair of damaged materials are covered by this agreement. If possible, processing fees should be waived. CIC libraries will promptly pay the lender's charges for lost or damaged materials.

LOAN PERIOD

The standard CIC loan period for circulating books is twelve (12) weeks. Lenders should account for delivery time by adding six days to the due date to ensure that the user has use of the material for the full loan period. There is a minimum of one four (4) week renewal. The loan period for non-book formats, theses, bound volumes, reference, or special material is at the discretion of the lending library in order to encourage a greater willingness to lend such items.

BEST PRACTICES

- Every effort will be made to give CIC requests the fastest possible service.
- Lenders will fill all requests within two business days and respond as quickly as possible if unable to supply.
- Articles will be delivered electronically unless the legibility will be impaired by using this method.
- Recalls should be exceptions unless there is a good reason such as the material is needed for course reserve.
- Bills for lost material should be sent within a year of the due date.

PACKING AND SHIPPING

- A courier with trackable packaging must be used for shipping materials. These include UPS or Fed Ex.
- Packages should not exceed 30 pounds.
- A paging or request slip (printed from the ILL circulation function or from an ILL request) should be placed inside each item being shipped. Every effort should be made to return the appropriate paperwork with the material.
- Use appropriate wrapping and packaging based on material type and your delivery vendor. For more information on packing refer to Section 4.13 "Shipping" in the Interlibrary Loan Code for the United States Explanatory Supplement.



**Big Ten Academic Alliance Libraries
Discovery-to-Delivery (D2D)
Phase 2
Final Report**

Submitted by

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November 2015

CIC D2D Phase 2 Final Report

Executive Summary

Purpose and Charge

The work of the CIC Discovery-to-Delivery Task Force has now spanned two phases, with Phase 1 launched in May 2012 and resulting in the delivery of the [*Framework for Discovery-to-Fulfillment Systems Planning in the Context of CIC Resource Sharing*](#) report to the CIC Library Directors in May 2013. In response to this first report, a Phase 2 was requested in February 2014 by the CIC Library Directors. As such, a task force representing public services, interlibrary loan/fulfillment services, and information technology perspectives from across the CIC libraries were charged to:

1. Articulate **core design principles** to guide the modeling of ideal-state, yet achievable, discovery-to-delivery processes.
2. Analyze and illustrate **current state** discovery-to-delivery processes and environments.
3. Propose and illustrate an ideal **future state** discovery-to-delivery process(es).

Work responding to the Phase 2 charge has been conducted and is summarized in the following report. The overall objectives of this work has been to raise awareness around specific interdependencies as they affect decision-making; to sustain, if not enhance, operational effectiveness and efficiency in the support of these services; and, perhaps most importantly, meet the needs and expectations of end users in their information discovery and access activities.

Recommendations Summary

The report concludes with the following four recommendations (please see the fully-stated recommendations in full Report below, p. 13):

1. ***Establish, implement and practice documented “change management” processes in areas of high interdependency across the CIC, especially indicated in areas of shared policies, operations, and systems.*** (Immediate/low investment-level)
2. ***Marshal the CIC collective expertise and capacities of User Experience (UX) and business/systems analysts to focus on and address common end-user discovery-to-delivery interface fail-points.*** (Immediate/low investment-level)
3. ***Establish a CIC 3-5 year strategic plan for the interlibrary/resource sharing component of the discovery-to-delivery supply chain.*** (Strategic/moderate investment-level)
4. ***Aggressively pursue an overall unified technology strategy for the interlibrary component of the CIC discovery-to-delivery supply chain.*** (Strategic/moderate investment-level)

These recommendations heartily support the premise that collective action strategies across the CIC, guided by holistic approaches, standard practices, and effective processes to ensure broadly considered and informed decision-making, provides opportunity to advance towards a strongly envisioned future state of discovery and delivery services.

Report and Recommendations

I. Background and Charge to the Task Force

The overall work of the CIC Discovery-to-Delivery Task Force spans two phases, with Phase 1 launched in May 2012 and, in response to its first report, Phase 2 charged in February 2014 by the CIC Library Directors.

Phase 1 – Completed Work

In May 2012, the CIC Library Directors charged a small project team to report on the range of issues and challenges pertaining to providing contemporary resource sharing services in our consortial context (this effort now referred to as Phase 1). The team was asked to pay particular attention to the challenges of creating a more seamless user experience from information “discovery” to “delivery” (or “fulfillment” as the term previously used). The challenges of doing so became evident from processes that led to decisions for the CIC to procure and implement UBBorrow, institutional decisions regarding participation in OCLC, and by a variety of other factors such as the availability of the Rapid ILL service, and the introduction of web-scale discovery tools into our libraries’ web environments. The team’s work led to an exploration of the larger *information ecosystem* – the intersections, dependencies, and practices associated with facilitating discovery-to-delivery services within and across our libraries – in an attempt to identify themes and practices that could lead to improved integration of this work at either the local or consortial level. This work resulted in delivery of the [*Framework for Discovery-to-Fulfillment Systems Planning in the Context of CIC Resource Sharing*](#) report to the CIC Library Directors in May 2013.

Phase 2 – Rationale and Charge for Current Work

In response to the Phase 1 report, the CIC Library Directors requested that a Phase 2 effort be initiated that would focus on developing a preferred, if not ideal, discovery-to-delivery model. It was noted that such an articulation could influence adoption of standardized approaches that advance both institutional and consortial intentions in this complex service area. The development of this model would to recognize the multidimensional interdependencies of functions (i.e., information discovery systems, information fulfillment systems and services, public services, and user experience design), and institutions (i.e., individual policies, operations, and practices of 15 research libraries joined in consortium, in addition to the community’s relationships with relevant vendors). Additionally, in many cases there are additional local or state interdependencies to be considered, too, as several CIC institutions are the flagship institutions for their statewide systems. These institutions need to balance policies and practices between CIC institutions as their primary peers in resource sharing and delivery and those with statewide obligations.

Noting these motivations, the following Phase 2 charge was issued (abridged version, see Appendix A for full charge):

A task force representing public services, interlibrary loan/fulfillment services, and information technology perspectives from across the CIC libraries are charged to:

4. *Articulate **core design principles** to guide the modeling of ideal-state, yet achievable, discovery-to-delivery processes.*
5. *Analyze and illustrate **current state** discovery-to-delivery processes and environments.*
6. *Propose and illustrate an ideal **future state** discovery-to-delivery process(es).*

The overall objectives of Phase 2 work has been to raise awareness around specific interdependencies as they affect decision-making; to sustain, if not enhance, operational effectiveness and efficiency in the support of these services; and, perhaps most importantly, meet the needs and expectations of end users in their information discovery and access activities. This work holds as a premise that collective action approaches across the CIC, guided by a holistic approach and standard practices, provides opportunity to meet these objectives.

Task Force Membership

To fulfill this charge, a task force comprised of the following members was formed in February 2014: John Butler, AUL for Data & Technology, University of Minnesota; Barbara Coopey, Assistant Head of Access Services, Penn State University; Lee Konrad, AUL for Technology Strategies and Data Services, University of Wisconsin; and Gary White, Associate Dean for Public Services, University of Maryland.

Additional Contributors

The Task Force would like to acknowledge CIC ILL Directors, CIC Library Information Technology Directors (LITD), CIC Public Services Directors for their solicited input and interactions at various points during this Phase 2 work. The Task Force also thanks the institutional participants in the Current State Use Case Analyses exercises: University of Illinois, Indiana University, University of Iowa, University of Maryland, University of Michigan, Michigan State University, University of Minnesota, University of Nebraska, Northwestern University, Ohio State University, Penn State University, and University of Wisconsin. The Task Force is very grateful to analysts Bruce Barton, Lisa Saywell, Heather Weltin (all University of Wisconsin), for the leadership of the design, execution, and analysis of the Current State Use Cases exercise. Finally, the Task Force acknowledges the thoughtful contributions of Hilary Thompson (Maryland), Barbara Coopey (Penn State), Melissa Eighmy Brown (Minnesota) to illustrating an ideal future state of discovery-to-delivery process(es).

II. Fulfillment of Task Force Charge

The following summarized the Task Force's work and recommendation to the three specific charge points (detailed above).

Charge #1: Articulate core design principles to guide the modeling of ideal-state, yet achievable, discovery-to-delivery processes. *Stated principles ought to help to ensure clarity and rationale of decision-making, as well as the realization of enhanced end user experience, and highly effective and efficient services operations.*

In response, the following recommended set of principles and suggested high-level requirements following each principle has been drafted in consultation with the CIC ILL Directors, Public Services Directors, and the Library Information Technology Directors groups.

Principles to Guide CIC Investments in Discovery-to-Delivery Architectures

Principle #1: Provide an optimal end-user experience.

Suggested high-level requirements -- the overall discovery-to-delivery solution should:

- a. Position state-of-the-art web-scale discovery systems *in front of* smart fulfillment mechanisms in ways that provide a cohesive and seamless interaction for the end user.
- b. Provide user-centric interfaces, that uses terminology that is understandable and useful to end users.
- c. Ensure simplicity and clarity around service options, and direction regarding steps and decision points in user workflows (e.g., next step options if item is unavailable, purchase options, etc.).
- d. Present consistent fulfillment options regardless of product used.
- e. Provide expected user conveniences relevant to the overall D2D workflow including, but not limited to, the:
 - i. pre-population of user request forms
 - ii. retention user identity information throughout the process, minimizing authentication events and other duplicative processes (such as re-doing searches as a result of lost identity information).
- f. Provide expected user controls relevant to the overall D2D workflow including, but not limited to, allowing users to:
 - i. set “need-by” dates.
 - ii. integrate ILL requests/loans with other personal fulfillment activity in “my account” (including tracking progress, expected delivery dates, cancellation options, renewal requests, etc.).
- g. Provide configurable push notifications and updates regarding transaction statuses.
- h. Minimize fulfillment time for items not immediately available at point of discovery (i.e., electronically or "on shelf").
- i. Reduce overall complexity of D2D processes for end users through seamless back-end integrations, rendering the order-request part of process to a near “invisible” state. Integrations would be established to search different systems for optimal fulfillment routes based on pre-determined or user-defined parameters such as needed turnaround time, location, patron status.

Principle #2: Use efficient and cost-effective means to support service operations.

Suggested high-level requirements -- the overall solution should:

- a. Help to minimize overall costs per transaction.
- b. Realize “total cost” economies that consider all aspects of operations support (i.e., IT systems, data management and processing, public service staff, logistical support, etc.)
- c. Scale effectively to meet increasing demand level.
- d. Allow load balancing to attempt an approximate a net 1:1 ratio of borrows to loans per institution as much as possible.
- e. Help to reserve human capacities for tasks requiring human judgment.
- f. Support advancement of increased and cost-effective resource sharing capacities across the CIC.

Principle #3: Use appropriate technologies to ensure the fullest possible interoperability across the CIC’s diverse technology environments.

Suggested high-level requirements -- the overall solution should:

- a. Interoperate effectively across the range of institutionally-preferred discovery/search environments.

- b. Be based on open standards and use open architectures (upon which further interoperability, extensions, and integrations can be built).
- c. Be non-proprietary with respect to business process and data exchange protocols.
- d. Be scalable and able to meet performance benchmarks.
- e. Be browser-agnostic.
- f. Use responsive web interface design.
- g. Use contemporary technologies, acknowledging the rapidly evolving information discovery, indexing, access, and delivery environments and supporting technologies.

Charge #2: Analyze and illustrate current state discovery-to-delivery processes and environments.

This analysis is expected to help develop a common understanding of the overall existing business processes, where interdependencies and decisions points are located (involving both consortial members and vendors), where divergences of practice may exist, and potential opportunities for future streamlining and standardization.

To achieve a *current state* picture, the Task Force pursued four activities: A) a CIC interlibrary loan borrowing activities and trend analysis based on recent years of self-reported ARL statistics, B) Preliminary OCLC analysis of the most recent 5 years of self-reported CIC borrowing and lending ILL data, including sharing done among the CIC libraries as well as the resource sharing that the 15 CIC institutions do with all partners and consortia via every system or method they each use; C) Profiling CIC discovery and ILL Architectures; and D) conducting empirical discovery-to-delivery use case analyses within current CIC library web interfaces. Findings are summarized below.

A) CIC Interlibrary Loan Trends

A longitudinal view of CIC ILL *borrowing* statistics, as self-reported to ARL (see table below), shows an overall and steady decrease of 12% across CIC libraries over five years (from 2009-2013), with the exceptions of University of Chicago (up 101%), Rutgers University (up 55%) and Northwestern University (up 15%). All other CIC libraries were either flat or down over the five year period.

B) OCLC's Preliminary Analysis of Most Recent Years of Self-reported CIC Borrowing and Lending ILL Activity

There are three methodological phases of this study, currently underway at the time of this writing¹), commissioned by the CIC ILL Directors to OCLC and Dennis Massie, Program Officer, OCLC Research. This study and analysis intends to:

1. Identify aggregate trends through tracking the volume in all 15 CIC libraries resource sharing activities, inclusive of returnables and non-returnables over five years across all the different sharing methods.
2. Investigate the activity of individual institutions, comparing each institution's numbers with group averages, and interview staff at each institution to gain some insight into the “why” behind perceived trends.

¹ Completion of a final report of this study is expected in early 2016, at which time a written report to the CIC ILL Directors group will be submitted.

3. Investigate the interactions within the CIC libraries consortium via OCLC ILL as new members join UBorrow, where OCLC has access to detailed data not provided by the participants; also to see if there is any correlation between trends in the self-reported ILL data and other data that is publicly available, such as each institution's library materials budget, expenditures overall per student, etc.

Preliminary and highly-summarized findings of the first phase of the study follow (see Appendix B for slightly more detailed slides of these early findings, as provided by OCLC's Dennis Massie, October 2015):

- Overall CIC collection sharing activity is trending downward, slightly at 7.3% (2011-2015)
- Via OCLC, from 2011-2015, CIC collection sharing of returnables is trending upward (with lending +12.8% and borrowing +17.3%); and non-returnables trending downward (with lending -26.3% and borrowing -19.6%)
- Other consortial borrowing activity that eight of the CIC institutions participate in is trending downward (lending -15.9% and borrowing -17%)
- CIC UBorrow collection sharing, for both borrowing and lending, has been ascending significantly since inception from 23,382 filled requests in 2012 to 191,275 filled requests in 2015
- Excluding UBorrow activity, from 2013 to 2015, CIC collection sharing activity via OCLC is trending downward for both borrowing and lending (-12.2%)
- UBorrow has begun to dominate CIC usage of OCLC ILL (2013-2015)
- In UBorrow activity, five of the 15 CIC libraries are *net borrowers*, and the remaining 10 are *net lenders*.
 - The Task Force further observes that currently four of the five *net borrowers* prominently feature UBorrow as a *discovery* option on the home/portal page of their library's web site. These same four CIC libraries also tend to have a higher percentage of unmediated (patron initiated) searches in UBorrow than mediated (staff initiated). (See the "UBorrow Universe" slide in Appendix B for more details.) The observations here suggest a correlation between privileging UBorrow as a discovery tool and the UBorrow net borrowing/net lending imbalance across the CIC. Finally, as stated in the Task Force's Phase 1 report, and worth noting here again: "*Presenting UBorrow -- primarily a fulfillment service -- to users as a discovery tool has raised a dilemma. On the one hand, it neatly moves closer to the ideal of seamlessness between discovery and fulfillment functions for the user. On the other hand, UBorrow does not rise to meet the new standard of (and user expectations for) web-scale search and discovery services.*" (Phase 1 Report, p.12).

C) Profile of CIC Discovery and ILL Architectures

All CIC libraries support a discovery system or service from either a major vendor or locally-supported open source application.² The systems and their respective indexes and interfaces, not unexpectedly, bear differing scopes and configurations across the CIC libraries. As emphasized in the Task Force's Phase 1 report, it is realistic to expect a continued state of diverse discovery technologies and systems across the CIC libraries and that emphasis is best focused on maximizing interoperability and complementary use of these technologies in the discovery-to-delivery chain.

All CIC library discovery systems/services are configured to interact with link resolvers that provide access to locally owned or licensed full text, catalog records and, on a more limited basis, a requesting option to either Interlibrary Loan or ILLiad. All use some standard form of user authentication (CAS, Cosign, InCommons/Shibboleth, EZProxy). And, in perhaps in the one exception to the known technological diversity across the consortium, *all* CIC libraries use ILLiad, the interlibrary loan management system provided by Atlas Systems. All CIC libraries use UBBorrow (Relais), with the majority now employing it for unmediated borrowing services. Many libraries have obligations to state or non-CIC consortial systems, which may or may not be integrated in their Discovery Service, and can bring complexity to operational functions as well as to the end user's experience in determining service choice and eligibility within a given interface.

Since its CIC implementation in 2011-12, request activity within the UBBorrow system, which provides for unmediated requesting of returnable items, has grown continuously. Cumulatively, over 230,000 items have been requested through UBBorrow, with a rough pattern emerging of 60% unmediated to 40% mediated requests. A major advantage of UBBorrow is its ability to identify and send requests to libraries with available items. Around 80% of UBBorrow requests are filled by the first available lender, expediting delivery. Also since its implementation, the CIC ILL Directors have worked with Relais to contract for a Relais web services option, which would allow for ILL requests to be submitted to and handled by the backend system without the user needing to interact with the Relais Z39.50 discovery web interface to submit a request.

Finally, RapidILL, a behind-the-scenes expedited article delivery system, is used by eight CIC libraries. Participants agree to reciprocal free lending and a response time of 24 hours. The average delivery time for articles here is 12 hours.

D) Discovery-to-Delivery Use Case Analyses

During Summer/Fall 2014, twelve CIC libraries participated in an informal empirical study, "Current State Analysis of D2D Use Cases for Unavailable Known Items." This exercise involved making observations of end-users (or "naïve" library staff members, when end-users were not available) searching for two articles and two books within their library's website (including discovery system) or via Google Scholar.

As a result, most libraries agreed that their library web sites were generally complicated and confusing with different vendor tools and varying levels of interoperability, thus presenting a complex discovery-to-delivery process for end users. Results showed that across these CIC institutions, article discovery-to-delivery works relatively well. Standard discovery/database vendors provide interoperability via a link resolver to either full-text or

²

The most recent survey of discovery systems in use across CIC libraries shows the following distribution: Ex Libris Primo (5), EBSCO EDS (3), ProQuest Summon (3), OCLC WorldCat Local (2), VuFind (2).

an OpenURL link to ILLiad. Google Scholar works well directing a user to library full text or back to the library, but initial setup is required if using library remote access.

In the course of this analysis, the effort uncovered a common fail-point across CIC libraries when ILLiad services were invoked by means of a link resolver connection. An entire end-user discovery and request process could abruptly fail due to inability to retain the OpenURL metadata in state if a user had to newly register for an ILLiad account in the middle of a discovery=>resolver=>ILL request process. Fortunately, a solution to this particular problem was found in ILLiad documentation that eliminates this problem: adding the “formstate tag” coding on new user web pages. Once the necessary coding is added on ILLiad pages, the openURL connection works and information is transferred into an ILLiad request form, even though the new user was directed to complete an ILLiad profile.

To smooth this issue even further, some institutions have implemented automated, daily ILLiad account provisioning procedures, so that users are never faced with the need to establish an ILLiad account. In the interest of leveraging federated authentication protocols and making management of this interoperability lightweight all around, discussions with Atlas are currently underway to determine whether methods using Shibboleth (and passing identity and institutional attributes) might be employed that could obviate the need for separate ILLiad accounts at all in order to use the service.

The use case exercises revealed that the discovery-to-delivery flow for books (or “returnables”) was complex and resulted in more “dead ends” than articles (or “non-returnables”). Also revealed was a considerable variety among libraries depending on which discovery systems used. A specific discovery system (and there are five different systems in use across the CIC libraries), along with its configuration, influences or perhaps even biases the discoverability of resources. Relatedly, a specific system will also have bearing on how fulfillment (or request and delivery) of a returnable is achieved. For example, libraries using WorldCat Local have an up-front ILL approach for returnables, whereas discovery systems from e-resource vendors like ProQuest Summon privilege access to article and eresource content.

Differential policies across institutions were also seen as likely to complicate workflow decisions when they involve returnables, much more so than with non-returnables. For example, some institutions allow an ILL to be placed if the item is checked out, whereas others do not allow, or prefer to direct the user to a recall for the checked out item. However, coinciding with the implementation of UBBorrow, the CIC libraries enacted a service enhancement by agreeing to a standardized 12-week loan period with no recalls for all circulating monographs.

Charge #3: Propose and illustrate an ideal future state discovery-to-delivery process(es).
Articulate changes and investments needed to close the gap between current and future states.

To frame the picture of an *ideal future state for discovery-to-delivery processes*, the Task Force turned for input to a sample of public service/ILL experts from selected CIC institutions (Maryland, Minnesota, Penn State). The result is a prioritized list of features, functions, interface conventions, and architectural components that were worthy of consideration in improving CIC D2D environments, by means of development or

influencing vendor roadmaps. These are keyed further below to categories identified in the [*Principles to Guide CIC Investments in Discovery-to-Delivery Architectures*](#).

Considerations of a future state first begins with an overarching statement offered by one of the public service/ILL expert contributors:

Interlibrary Loan now more than ever should be utilizing marketing strategies for promotion of our service that is so important to researchers and students. In doing so, Interlibrary Loan needs to make sure the service is easily usable and meets user expectations. How well are we meeting the needs of students, distance education patrons and those with disabilities? Interlibrary Loan should be investing in streamlined interoperability between library systems and exploring the efficiencies that can be obtained through API web services. It is with these ideas in mind that we should evaluate changes that we should strive for in an ideal future state of Interlibrary Loan.

Priority Elements of an Ideal Future State Design

1. Unified User Interface

- It is important to create a seamless experience for the user by only displaying one option that supports interlibrary loan or local paging within discovery systems. This could be achieved in part through the use of APIs for behind-the-scenes submission of requests to external systems.
- Smart fulfillment. Once a user selects content with a single request button (e.g., via an OpenURL link resolving service option), behind-the-scenes logic, based on predetermined and customizable criteria, would determine which system to use for fulfillment. This might work in a way similar to the functionality of RapidILL within ILLiad, which searches by ISSN and sends article requests to lending libraries or returns the article request with local availability information. OCLC direct request has the feature that can send a loan to a customizable predetermined set of libraries and ILLiad can have routing rules for this, so this is already possible.
- The user should be presented the same consistent ‘request’ button within various systems, databases, web pages. (Limitations: vendors don’t collaborate with other vendors; vendors limit local customization)

2. Unified User Accounts

- Patrons should be able to manage all aspects of requesting loans and copy of both locally-owned and interlibrary loan items through a single library account, regardless of the back-end systems involved in fulfillment.
- Utilizing web services functionality, integrate fulfillment activities for all forms of local borrowing, resource-sharing, and electronic delivery into a single, meta-account with customizable notifications.
- All physical checkouts of locally borrowed and ILL items should be within the user’s ‘my library account’ regardless of what system was used to request it. This needs to be a dynamic interoperability for circulation, renewals, recalls and restrictions such as library use only at the item level. NCIP (NISO Circulation Interchange Protocol) could be used for communication between the ILL system and the ILS.

3. User Notifications, Delivery Estimation, and Tracking

- User notifications for requested items of both locally-owned and interlibrary loan items should be centralized and consistent, regardless of fulfillment method.
- Fulfillment notifications should be expanded and customizable by users. Users would only have to configure the notifications once—but could be developed independently, provided that the account associated with each fulfillment system had the same options. Additional notifications that align with user expectations for online shopping should be provided (e.g., order confirmation, estimated delivery, item shipped, etc.). Users should be able to select which alerts to receive and the preferred method (e.g. email, text, both).
- Users should be provided with a delivery estimate before submitting the request (based on real-time availability from multiple fulfillment options), regardless of what system was used to request it. This could be done by scoping a search based on availability and/or by providing the user with an anticipated delivery timeframe at the point of request (e.g. “This item should be available within one week. Do you want to request it?”). Consortium catalogs should have the ability to estimate delivery based on geographic location of lending libraries. Users should be able to understand at the time of requesting what format is available and to clarify their preference, such as for download, loan, or purchase.
- Tracking and status notifications should be customizable. Some patrons may want to know the status of each step of the request process, whereas others do not. While a user does not need to know how a request is being filled, knowing when the item will be available is critical. Patrons regularly express a need to know when an item has been shipped from a lending library and is on the way. It would need to be clear that material has been shipped from a lending library or if it has been shipped to the user’s office or home.

4. Service Visibility/Ubiquity within User Interface

- Explore the use of current technology (e.g., web services) and strive to enter into collaborative efforts with information providers to increase visibility of Interlibrary Loan across databases, platforms and websites, perhaps even those outside of libraries (e.g., Google Scholar connecting users with their library). There are many users of online courses, distance programs, and off campus research centers that may not know they have access to a library service that can provide them with resources outside of their reach.

5. Other Suggestions, Comments and Opinions

- Improve dissemination of consortium-wide resource sharing data to inform cooperative collection development/realignment.
- Increase Interlibrary Loan service for any material not available locally, such as lost, missing, claimed returned or checked out items. Consider purchasing lost or missing materials ordered through Interlibrary Loan through the library’s on-demand program.
- Investigate back-end interoperability with digitization, local paging and acquisitions systems.
- Apply accessibility compliance (OCR compliance) to all digitally shared articles and books.
- Investigate peer-to-peer requesting between the CIC libraries who share the same ILS. Networks of libraries can currently be configured in, for example, Ex Libris Alma for Resource Sharing activities. A move towards sharing our resources

within the same network by using compatible barcodes for circulation and bypassing other systems such as OCLC will strengthen our collaborative efforts, especially towards a shared print collection and cooperative collection development.

- Fulfill all copy requests electronically within ILLiad regardless of whether the print or electronic copy was found.
 - Concentrate CIC ILL technology and systems investments in ILLiad (Atlas). ILLiad is standard system used by most libraries and users are familiar with it when they go to another university. ILLiad is a flexible, locally customizable product that can be utilized for many services. Atlas is responsive to user community, proactive in its development, and will work with a library for specific local conditions.
 - Investigate ways to connect users who are discovering elsewhere with library applications that can complete fulfillment (e.g., Google Scholar). Investigate whether ILLiad can be a player in extending this concept. Employ system application programming interfaces that can connect the user with the library regardless of which website he/she is using. The user can plug in/identify their library or university (which would be an OpenURL address to ILLiad). The user can add this “API” to their laptop or any device. When an item is discovered elsewhere, the user can deploy the API which will connect the user to an ILLiad request form. Then, with a “fulfillment management service” within ILLiad, the request will be sent through a customized, prioritized list of lending systems. Atlas already has developed the “addon” technology which, with some additional programming, can be used within the “fulfillment management service” to assist in the seamless discovery to delivery process.
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III. Related Involvements During Phase 2 Work

During the course of Phase 2 work, the Task Force was asked to consult and make recommendations on a number of in-play planning and development activities in areas related to CIC-level discovery-to-delivery operations. These included:

- *Discovery and Access to Materials in the CIC Shared Print Repository Report*; comments requested by the CIC CLI Director, October 2013; the Task Force (interim status between phases) responded with commentary and key questions. Specifically, it sought the Directors’ feedback on whether this case, along with other similar cases, provides opportunity to set a CIC standard for discovery and fulfillment services related to CIC consortially--supported resources. (See Appendix C for full Task Force recommendation.)
- *Relais Discovery Web Services Proposal*; initiated by the CIC ILL Directors in working with Relais, January 2014; the Task Force endorsed the direction and architectural principles undergirding this proposal to operationalize an API/web service to the Relais system. The review of this proposal employed the Task Force’s proposed *Principles to Guide CIC Investments in Discovery-to-Delivery Architectures* (presented above).
- *Relais D2D Hybrid SOLR Indexing- Z39.50 Architecture Proposal*; initiated by the CIC ILL Directors in working with Relais, March 2014. In formulating a response to this proposal, the Task Force sought and received extended feedback from CIC public services and information technology

leaders. In reviewing responses, the Task Force found insufficient support from the CIC LITD community for the proposal, citing major questions regarding the cost/benefit of the proposed architecture and its overall value proposition. As a result, the Task Force recommended no further pursuit of the proposal. (See Appendix D for full Task Force recommendation.)

- *Atlas Addon for ILLiad-UBorrow Integration*; out of joint discussions between CIC ILL Directors, the Task Force, and other interested technologists and service personnel from across the CIC around testing the commissioned Relais web service/API, emerged the idea to pursue a seamless integration between ILLiad (Atlas) and UBorrow (Relais) functions. If enabled, this could allow loan requests received in ILLiad to be automatically sent out via the UBorrow API. The delivery of the Atlas Addon is pending, as of mid-October 2015.
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IV. Recommendations

Guided by its charge, the analysis and findings of the Task Force led to the following four recommendations, which are presented in two groups -- *Operational with low investment needed* and *Strategic with moderate investment needed*.

Operational / Low Investment-level

1. **Establish, implement and practice documented “change management” processes in areas of high interdependency across the CIC, especially indicated in areas of shared policies, operations, and systems.** The discovery-to-delivery service area, one of extensive interdependency not only across the consortium but also within each participating institution, needs such a governance process and discipline. The Task force recommends putting in place agreed-upon and documented processes for proposing, reviewing, selecting, testing, approving and implementing technology and service changes affecting multiple functions across multiple participating institutions. For D2D, inputs are essential from multiple institutional and functional perspectives including those of public services, interlibrary loan, information technology, collection development and acquisitions, to name the obvious ones. The governance aspect of this recommendation is that overall review and especially decision-making processes be guided by a set of guiding principles, agreed to by consortial partners (see proposed [Principles to Guide CIC Investments in Discovery-to-Delivery Architectures](#), submitted by this task force.) This recommendation strongly echoes the leading recommendation made in the Task Force’s Phase 1 report, which read:

Recommendation

Formalize and document standardized processes for CIC resource sharing systems deployments and operational planning, decision-making, and execution. Elements of a standardized process may include articulation of:

- *End user requirements, expectations, and priorities*
- *Operational requirements*
- *Financial requirements and implications*
- *Technology requirements and implications*
- *Contractual requirements and other institutional commitments or constraints*
- *Policy considerations*
- *Decision-making authorities and sign-off processes*

2. **Marshal the CIC collective expertise and capacities of User Experience (UX) and business/systems analysts to focus on and address common end-user discovery-to-delivery interface fail-points.** Often, it is the small failings within a library's web interface that can lead to end-user frustration, incompleteness of task, and abandonment of service. The task force's engagement with CIC libraries' staff to conduct a "current state" analysis of several typical end user tasks in existing interfaces revealed (or emphasized) key points of failure previously under-recognized by library staff. This activity, if developed and executed as a shared practice, holds potential for low-cost/high-impact results for end user success. To further this recommendation, it is advised that the CIC libraries draw upon its collective UX Analysis expertise in the form of a task force or user group to construct lightweight, yet effective usability testing protocols that can be applied to a standard set of relevant end user tasks. These protocols can be applied as baseline tests and/or when changes are introduced into end user workflows and interfaces. Open sharing of these findings holds potential for multiplier impact and the identification of exemplars to cultivate model interface designs.

Strategic / Moderate Investment-level

3. **Establish a CIC 3-5 year *strategic plan* for the interlibrary/resource sharing component of the discovery-to-delivery supply chain.** This would help balance opportunism that is often sparked in a rapidly changing technology environment with sound principles of strategic planning (i.e., trends analysis, use of future state analysis and prioritization of service development, and consideration of resource constraints/parameters). In consideration of strategic interests and appetites for continuous improvement, there is need for the *levels of investment here to be proportionate to levels of future need and demand*, as may be forecasted through ILL service data trends, shifts in the broader environment as related to e-content publishing and on-demand provisioning, emerging resource sharing systems, and other relevant data. To further this recommendation, it is advised that a consultant work with a task force representing the interdependent service/functional areas in discovery-to-access service and support areas. Current ILL historical and trend analysis work that the CIC is conducting with OCLC would be expected to inform this planning.
4. **Aggressively pursue an overall *unified technology strategy* for the interlibrary component of the CIC discovery-to-delivery supply chain.** While this may most appropriately be an outcome of strategic planning, there is known fragmentation (and, therefore, overhead) in the current ILL ecosystem that can be reduced through greater unification of ILL management systems and enhanced interface between discovery and ILL systems. Herein may also be opportunity for the CIC to exert collective market approaches to service/system licensing, as well as influencing more expeditious product development (i.e., system vendors are expectedly reluctant to commit to "one-off" development for single or few institutions and even more so when development involves more than one vendor). Acknowledged are specific constraints that individual institutions may have due to multiple consortial operational relationships. To further this recommendation, it is advised that an independent consultant well-versed in these technologies and their markets be commissioned to analyze the current state and recommend a solution(s). Furthering interactions with the [NISO Discovery to Delivery Topic Committee](#) and or its members may aid guide strategy development.

These recommendations heartily support the premise that collective action strategies across the CIC, guided by holistic approaches, standard practices, and effective processes to ensure broadly considered and informed decision-making, provides opportunity to advance towards a strongly envisioned future state of discovery and delivery services.

Appendix A

CIC Discovery-to-Delivery Phase 2 Charge

Overview and Objectives

In response to the May 2013 report, *Framework for Discovery-to-Fulfillment Systems Planning in the Context of CIC Resource Sharing* [need URL], the CIC Library Directors have requested that focused attention be given to developing a preferred, if not ideal, discovery-to-delivery model. Such an articulation may influence adoption of standardized approaches that advance both institutional and consortial intentions in this complex service area. The development of this model needs to recognize the multidimensional interdependencies of functions (i.e., information discovery systems, information fulfillment systems and services, public services, and user experience design), and institutions (i.e., individual policies, operations, and practices of 15 research libraries joined in consortium, in addition to the community's relationships with relevant vendors). " In many cases, there are additional local or state interdependencies to be considered, too, as several CIC institutions are the flagship institutions for their statewide systems. Although they look to CIC institutions as their primary peers in resource sharing and delivery, they have to balance policies and practices with statewide obligations.

The overall objectives of this work are to raise awareness around specific interdependencies as they affect decision-making; to sustain, if not enhance, operational effectiveness and efficiency in the support of these services; and, perhaps most importantly, meet the needs and expectations of end users in their information discovery and access activities. This work holds as a premise that collective action approaches across the CIC, guided by a holistic approach and standard practices, provides opportunity to meet these objectives.

Charge

A task force representing public services, interlibrary loan/fulfillment services, and information technology perspectives from across the CIC libraries are charged to:

1. Articulate core design principles to guide the modeling of ideal-state, yet achievable, discovery-to-delivery processes. Stated principles ought to help to ensure clarity and rationale of decision-making, as well as the realization of enhanced end user experience, and highly effective and efficient services operations.
2. Analyze and illustrate *current state* discovery-to-delivery processes and environments. This analysis is expected to help develop a common understanding of the overall existing business processes, where interdependencies and decisions points are located (involving both consortial members and vendors), where divergences of practice may exist, and potential opportunities for future streamlining and standardization.
3. Propose and illustrate an ideal *future state* discovery-to-delivery process(es). Articulate changes and investments needed to close the gap between current and future states.

Membership

The task force membership consists of:

- John Butler, AUL for Data & Technology, University of Minnesota
- Barbara Coopey, Assistant Head of Access Services, Penn State University
- Lee Konrad, AUL for Technology Strategies and Data Services, University of Wisconsin
- Gary White, Associate Dean for Public Services, University of Maryland

Sponsors

Representing the CIC Library Directors in sponsorship of this task force are:

- Wendy Pradt Lougee, University Librarian and McKnight Presidential Professor, University of Minnesota
- Ed Van Gemert, Vice Provost for Libraries and University Librarian, University of Wisconsin

Timeframe

A final report is due in advance of the May 2014 CIC Library Directors meeting. Interim reporting to the sponsors will take place in the intervening time.

Appendix B

OCLC's Preliminary Analysis of Most Recent Years of Self-reported CIC Borrowing and Lending ILL Activity; Slides by Dennis Massie, OCLC Research, October 2015.



October 26, 2015

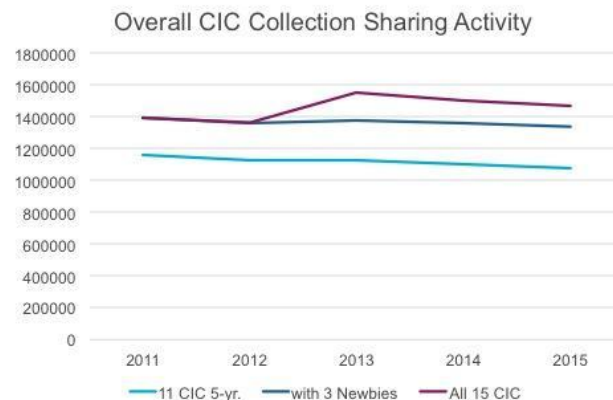
Preliminary Results CIC ILL Study, First Phase

Dennis Massie

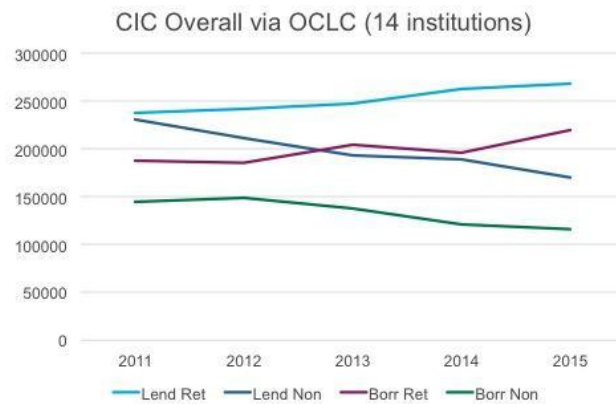
Program Officer, OCLC Research



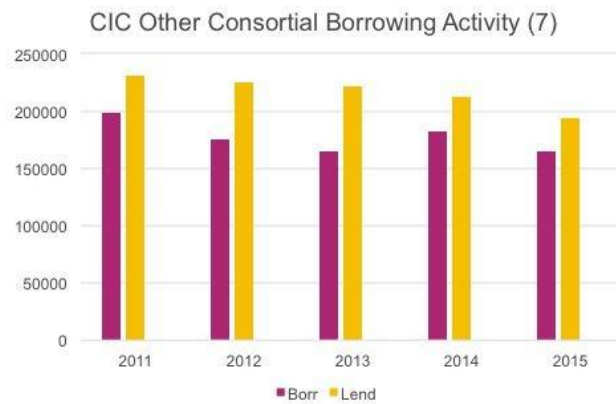
Total sharing activity is going down.



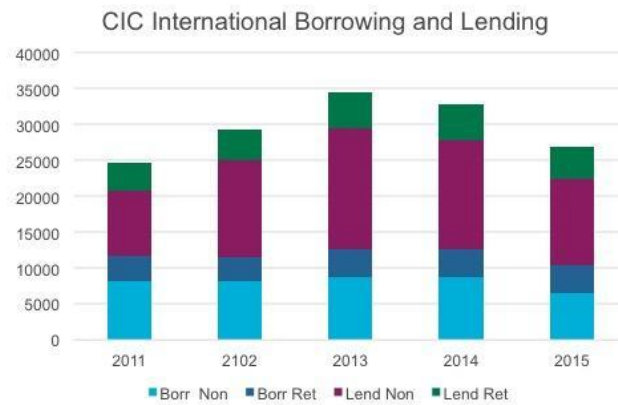
On OCLC, Sharing Ret's up, Non's down.



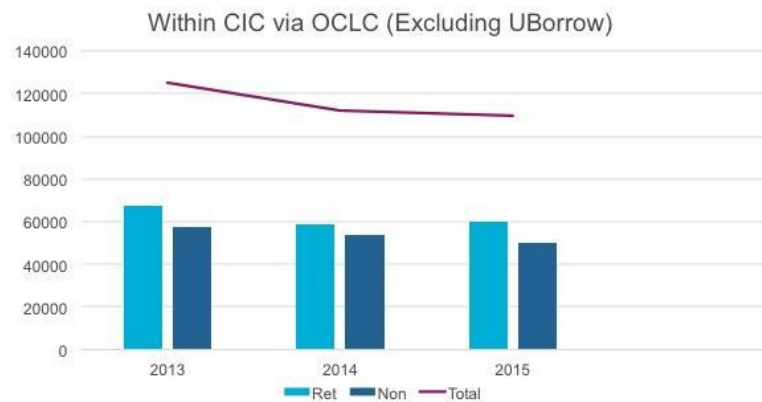
Other Consortial Borrowing: Down-ish.



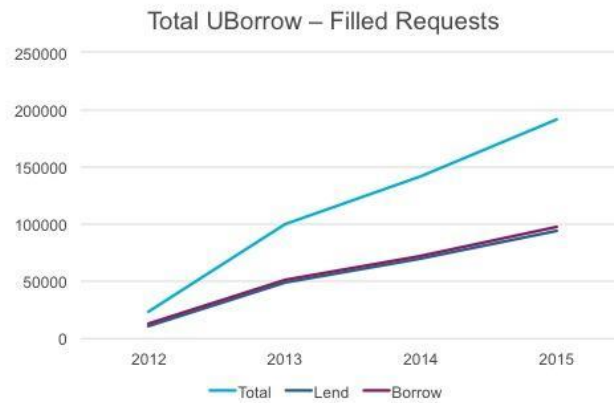
International lending of Non-ret's is big.



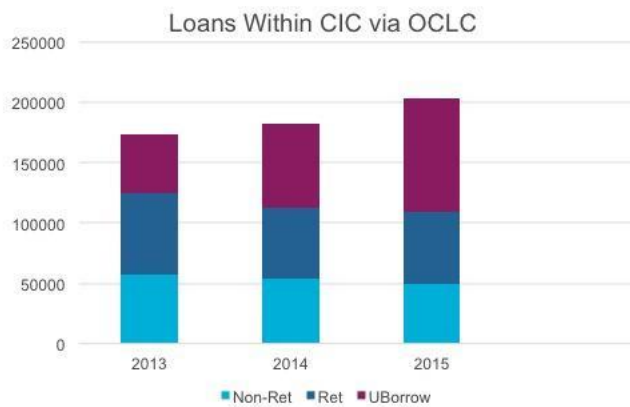
Non-UBorrow CIC OCLC traffic down.



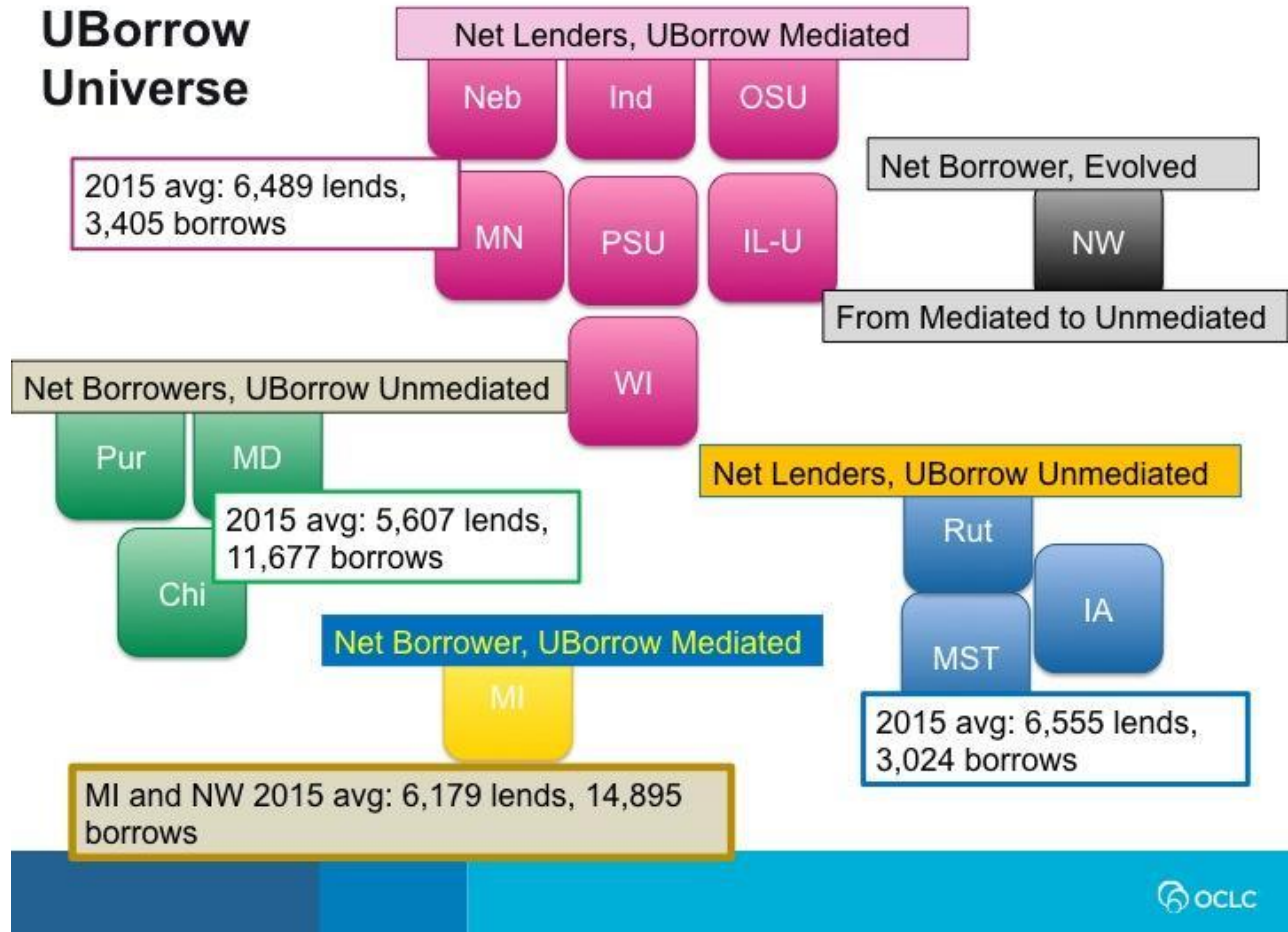
UBorrow traffic is way, way up.



UBorrow dominates CIC usage of OCLC ILL.



UBorrow Universe



Appendix C

Task Force Response to the *Discovery and Access to Materials in the CIC Shared Print Repository Report*; as requested by the CIC CLI Director, and excerpted as part of a larger update on related activities, November 2013

8 -Nov -2013

TO: CIC Directors

FR: Discovery to Fulfillment Working Group (John Butler, Barbara Coopey, Lee Konrad, Gary White)

RE: Update

<excerpt begins>

The CIC Discovery Task Force has recently been asked to respond to the report, “Discovery and Access to Materials in the CIC Shared Print Repository,” submitted by the CIC Shared Print Repository (SPR) Discovery and Access Working Group. The report provides an analysis of options and does not make recommendations. Rather, it defers to each institution to make its own decisions in the context of its own discovery needs and preferences related to materials in the SPR. While the Task Force has not yet had opportunity for full deliberation of the report, the Task Force seeks the Directors’ feedback on whether this case, along with other similar cases, provides opportunity to set a CIC standard for discovery and fulfillment services related to CIC consortially--supported resources.

Specifically, given:

- the near -ubiquity of web-scale discovery systems across CIC libraries, a model that embraces large-scale aggregation of searchable metadata representing works within and beyond our local collections;
- the scaled and efficient way in which these data can be consolidated for collective access and use (compared to institution-by-institution record-loading approaches);
- the consortial investments that we have committed to making available resources and services such as the SPPR, CRL, the HathiTrust, and others (e.g., arXiv, SSRN);
- the investments that we have made in services to ensure the access to these resources (i.e., electronically or via physical delivery); and
- the affirmed goal of creating a coherent and successful experience for our users,

Should the CIC Libraries move towards a standard (and expectation) of making these consortially--supported resources discoverable through our institutions’ primary discovery interfaces (i.e., local catalog, discovery layer, or blended)?

<excerpt ends>

Appendix D

Relais D2D Hybrid SOLR Indexing- Z39.50 Architecture Proposal

Response and Recommendation by the CIC Discovery-to-Delivery (D2D) Task Force; October 2014

In support of its work with the CIC ILL Directors group, the [CIC Discovery-to-Delivery Task Force](#) (Lee Konrad, Wisconsin; Barbara Coopey, Penn State, Gary White, Maryland, and John Butler, Minnesota) requested input from the CIC Library Information Technology Directors (CIC LITD) on a technology development proposal by Relais, working with Index-Data to develop a hybrid SOLR Indexing- Z39.50 architecture in support of CIC Interlibrary Loan services. The proposed architecture featured a SOLR-based index for discovery services that could turn to the Z39.50-based Relais system for holdings and availability information and its request functions (including unmediated). The proposal would have CIC institutions contract with Index-Data to generate and maintain a centralized SOLR/Lucene index comprised of consolidated CIC UBorrow catalogs. The intent of this proposed architecture would be to mitigate some of the problems associated with Z39.50 searching, including retrieval slowness and diverse Z39.50 configurations.

The brief proposal (3 pages) contained a section, "Effort required by participating libraries," which read:

Any library who wishes to use the central index in lieu of their local Z39.50 server must make a dump of their bibliographic catalog available, in MARC21 format, on a webserver. The harvester will check the file daily for changes, and retrieve and re-index databases as often as needed: The library is free to decide how often to update the file. The simplest approach is often to provide a complete dump of the catalog, but if the library prefers to provide incremental updates, this is possible as well.

To prompt input from the CIC LITD on this proposal, the following two questions were posed:

1. How supportable would you find making your bibliographic catalog data continually available (and refreshed) for harvesting by the central index?
2. Are there other models, perhaps existing, that ought to be considered for leveraging as an alternative to creating the proposed aggregation for the sole purpose of unmediated interlibrary fulfillment?

Responses from CIC LITD were received from 9 individuals at 6 different institutions³ and are summarized in the following Plus/Delta table.

³ Institutions of responding individuals were Michigan State, Minnesota, Nebraska, Northwestern, Penn State, and Rutgers.

Plus (+)	Delta (Δ)
● Faster response time: with Z39.50, broad search can take over 10 seconds to load; narrowly defined searches (such as known-item) load in 2-4 seconds. In general, SOLR-based searching is significantly faster. ● Potential to overcome search retrieval limits of some Z39.50 configurations (i.e., some systems, like ILL, cap retrieval limit at 500; others are unlimited, and much in-between). ● SOLR index searching could potentially allow search for items using criteria that are not easily searched via the Z39.50 protocol (e.g., by language). ● <i>If</i> UBorrow is to be considered a discovery layer to the collections of all the CIC libraries, then the increased cost and complexity of the hybrid Relais-Index-Data architecture <i>may</i> be worth it. <i>However</i>, the simpler introduction of the Relais APIs would allow for integration of Relais into robust primary discovery tools for search and rely on the Relais application to supply holdings and availability information and to support unmediated request functions.	● This would increase costs of and complexity to the overall UBorrow architecture. It would require each library to generate and update a “shadow” catalog of bib records, which could accurately track additions and deletions from the database in a timely way. In short, there is perceived significant data ETL overhead, for each institution (3 institutions echoed this concern) ● This solution would introduce a new form of data latency (only as current as last extract). For the primary purpose of fulfillment (discovery is not the primary purpose here), what is needed most from a solution is accurate holdings and availability information and quick response for known-item or well-defined searches (i.e., not open-ended discovery) ● Solution does not address how duplicate records would be handled on the index side; a challenge that would likely be exacerbated by record inconsistencies. Record du-duping has presented itself as a significant challenge in other SOLR-based consortial discovery indexes. For de-duping to work, there must be comprehensive and consistent availability of unique identifiers, such as OCLC numbers (ISBNs and ISSN are not sufficient). There are significant numbers of records that lack OCLC identifiers or that place them in the wrong field or use inconsistent syntax. ● System resources overhead is significant,, though it may be mitigated some by use of incremental updates, rather than full data loads ● The proposed solution is over-engineered; solving a problem that is not as big as the solution (e.g., patterned use of D2D is for known-item searches, where Z39.50. “Do we really need another union catalog, when we are mostly looking to UBorrow as an ILL tool?”) ● Proposed solution would require everyone to commit to the methodology, and at a perceived greater resource expense than

	running Z39.50 as the end-to-end solution. • This would likely result in unevenness of ETL (extract-transform-load) from institution to institution, possibly resulting in unevenness of currency and request distribution inequities. • Not scale-appropriate (may be OK for smaller institutions) • The hybrid solution is still dependent on Z39.50 and its weaknesses for retrieval of holdings and availability information from individual catalogs. While Z39.50 made be a legacy data exchange protocol, it is still a standard. The hybrid solution may not be standards-based at all and could possibly be proprietary, posing possible future interoperability and migration constraints.
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Questions

In addition, the proposal raised the following fundamental questions about problem identification, and the right-scaling of a solution to the identified problem:

- What exactly is the problem we are trying to solve, and how consequential is the problem?
- What might the effect of webscale discovery systems be on ILL borrowing trends moving forward?
- “Is the juice worth the squeeze?” when presented with a decision of unknown marginal gain. Does the problem statement and solution adequately sell the need for even the minimal work implied? The case faces an even steeper hill since status quo Z39.50 libraries do not appear to be disadvantaged by this proposal.

Recommendation

The CIC Discovery-to-Delivery Task Force currently finds insufficient support from the CIC LITD community for the Relais D2D Hybrid SOLR Indexing- Z39.50 proposal, citing major questions regarding the cost/benefit of the proposed architecture and its overall value proposition. As a result, the Task Force does not recommend further pursuit of the proposal.



A Vision for Next Generation Resource Delivery

Report of the Big Ten Academic Alliance Discovery to Delivery
Project Action Committee

November 17, 2016

Submitted by

Bruce Barton University of Wisconsin

Melissa Eighmy Brown University of Minnesota

Zoe Chao Penn State University

Kurt Munson Northwestern University

Ken Varnum University of Michigan

Executive Summary

The Big Ten Academic Alliance Discovery to Delivery Project Action Committee (D2D Action) was charged with developing a plan for collective action. This plan has added urgency given OCLC's March 2016 announcement that ILLiad will be moved to a cloud-based platform. The foundational software platform for interlibrary loan processing is being fundamentally altered. Thus the BTAA has a unique opportunity to influence a new product's architecture and functionality to ensure that our needs are met. To this end, rather than stating resource requirements, implementation priorities, and timetables, this report outlines expectations for a next generation ILL management system's functionality. The situation is too fluid to state priorities though we should anticipate implementation in three years. In many ways, this should be viewed as a system migration rather than a series of incremental changes.

This report covers four broad topics. Specifically, it:

- Identifies issues with the discovery to delivery process as it exists now,
- Defines a desired patron-centric state for discovery to delivery while noting additional emerging trends and unaddressed needs,
- Describes the underlying architecture that the desired patron-centric state requires, and
- Defines the investments and resource requirements needed to implement the desired state.

As addressed in both the [2013 Framework for Discovery to Fulfillment Systems](#) and the [2015 D2D Phase II final report](#), the discovery to delivery process is fragmented with too many services and options presented to patrons. Moreover, the variety of discovery tools employed across the BTAA's libraries limits the degree of standardization possible. As a result, the D2D Project Action Committee recommends the development of a platform neutral "get it" functionality that can be added to any of the BTAA discovery interfaces as the way for a patron to initiate the delivery process.

Discovery and delivery are in response to patrons' information needs. While discovery can and does happen anywhere, requests for delivery of locally available, remotely available, or any other resource should be processed in one place, whether or not the library owns or licenses the resource. Access and delivery options should be communicated in terms that matter to the patron: When can I expect to receive the item? How will it be delivered? Is there a fee for this service? Similarly, our patrons should be able to go to one place to track and manage their requests, loans, and fees, however these are managed through backend systems. And, although it is a small detail, patrons should be able to choose how and when they hear from us.

In contemporary library systems architecture, discovery and delivery are managed by different systems. Commercial web scale discovery platforms (e.g., Primo, Summon, and WorldCat discovery services) and open source discovery layers (e.g., Blacklight and VuFind) provide the discovery interface to our patrons, but call out to backend systems (Alma, WorldShare, Voyager, Aleph, Summon, 360 Link, SFX, and so on) to determine access and delivery options. These options are then presented to

patrons, sometimes within the discovery interface, and sometimes on intermediate pages, as lists of possible options.

Interlibrary loan systems, e.g. ILLiad and UBBorrow (Relais), run independently of the library's library service platform (LSP) or earlier generation integrated library system. And the patron's experience of these delivery services occurs outside of the library's principal discovery platform, often jarringly so and after the patron follows a not so obvious route to get there.

Our core recommendations are:

1. Do for ILL and document delivery what is already done for local physical resources and eresources: bring these delivery options into the discovery platform.
2. Extend the discovery platform to accept OpenURLs and other citation-like input in addition to patron input at a search prompt. When the library owns or licenses the cited resource, the discovery platform presents access and delivery options per the library's policies. When it does not, the platform presents request options, again per the library's policies.
3. Whatever backend systems manage patron transactions, present all loans, requests, fees, and associated actions in a single library account interface.

Accomplishing these long-term goals will require investments in system integration by libraries through active participation in product feature design, selection, and early adoption, and by vendors independently through product development and collaboratively through the development of interoperability standards. OCLC's development of a new cloud-based ILL product and the ongoing evolution of cloud-based discovery and LSP platforms as well as shifts in product/vendor alignment provide the opportunity to exert this kind of influence through active participation.

We recommend three areas for action, in the near-term, in order to move us toward the long-term goals:

1. Exert influence on future product development. While we are limited in our ability to implement the desired state today, we are in a position to influence the direction future development of these systems takes. Promoting this vision to other consortia and large research libraries would broaden this influence.
2. Make full use of the currently available technologies and best practices.
3. Experiment with user experience design and behaviors, and share usability findings.

In the short term, BTAA libraries are investing in API-level system integrations using UBBorrow web services, ILLiad Addons, and NCIP (NISO Circulation Interchange Protocol) integration for circulation management. Further integrations with shipping services and with document suppliers, and full NCIP integration are possible; we anticipate seeing experiments and investments by BTAA libraries at this level as well. BTAA libraries should encourage vendors to make incremental improvements to their support for these integrations. Advances at this level will improve the patron's discovery to delivery process experience through automation and simplification. Moreover, these advances will also reduce the level of (often manual) staff effort needed to process and manage requests.

Finally, we recognize the need for and encourage experiments in developing the fuller, more integrated patron discovery-to-delivery experience we envision. We look to BTAA members who have developed their own discovery platforms or use open source discovery tools to prototype and test integrations when backend systems support them.

BTAA Discovery to Delivery Project Action Committee Report

Purpose and Charge

The BTAA Discovery to Delivery Project Action Committee will build on the assessment work of the D2D Task Force by addressing the recommendations and developing a plan of collective action for the Big Ten Academic Alliance. Drawing on the agreed upon principles, the BTAA D2D Action Committee will:

1. Prioritize and identify near-term investments in process improvement identified in the D2D 2015 report. Areas for review and recommendation for action include:
 - a. Unified user interface to create a seamless experience for the user and smart fulfillment.
 - b. Unified user account capacity for all interlibrary loan activity, utilizing web services functionality.
 - c. Improved user notification capabilities to ensure timely information on status and delivery.
 - d. Options to increase visibility of fulfillment services across web-accessible library resources and services.
2. Review and test technology and service changes that impact the discovery-to-delivery workflow.
3. Document resource requirements and implementation priorities and timetables for BTAA member institutions.
4. Oversee and coordinate implementation of recommended actions.

This report will outline both the visionary state we would like to see implemented across the BTAA libraries and a plan of action for near-term investments in process improvements.

Introduction

In March of 2016, OCLC announced that the ILLiad community will be moved to a cloud-based platform. While the system is under development and will not support large academic research libraries until at least 2018, the eventual move has provided context for this report. In order for the BTAA to move forward with the recommendations set forth by the Discovery to Delivery committee, we see OCLC's development of the new platform as an ideal opportunity to create a new and improved architecture of Interlibrary Loan. The BTAA libraries would like to work with

OCLC towards an ideal future-state of discovery to delivery. Similarly, consideration of an alternative ILL vendor platform would take this vision into account. At the same time, web scale discovery platforms and open source discovery tools such as Blacklight and VuFind continue to evolve. The BTAA libraries who use these platforms are often in a position to influence the future trajectory of these platforms through active participation in product feature definition and selection. Open, API-based systems that readily support interoperability on the level of fulfillment options and user transactions management will be key components supporting a unified user interface for smart fulfillment and a unified user account for all circulation and delivery activities.

We also need systems that are flexible and customizable to address each library's needs. While there is broad agreement across the BTAA in terms of creating the best possible experience for our users, the discovery-to-delivery process is not a "one size fits all" monolithic environment. We support a wide range of search experiences -- from undergraduates to medical residents to researchers and faculty -- and differences in policies, priorities, and service levels reflect the local needs of our communities and our budgetary realities. Still, there are common threads in the problems our patrons face. With consideration of each institution's unique systems and workflows, we plan to prioritize and identify investments in technology that support our collective need for an improved discovery to delivery experience for our users.

Current and Desired State of Discovery to Delivery

The patron wants materials, books, articles, dissertations, DVDs, newspapers and such to fill an information need. Where those materials are located or from which library they come is largely irrelevant to the patron's desire to get the resources.

The previous BTAA D2D Task Force examined the current state in both 2013 and 2015. The Task Force identified ARL ILL Borrowing trends across the BTAA from 2009-2013, evaluated use cases across institutions, and tested discovery via OpenURL at three institutions. The current state in this report is focusing on the fulfillment of the users' request and where there is room for improvement.

The current discovery to delivery process is incoherent, particularly to patrons, with individual products each handling one piece of the process. The flow of information between them is disjointed. Patrons must submit requests item by item, rather than as a group, set of results selected from a completed search, or from a bibliography. Staff processing of requests remains labor intensive as each request is processed individually using several discovery layers or tools exposed within the ILL management system. The ability to automatically route requests, for which no staff review is required, remains underdeveloped and stunted. DOCLINE provides the best example of this archaic approach. Even though the vast majority of articles requested via DOCLINE are discovered via PubMed and therefore include the PMID, DOCLINE processing requires each citation be verified against PubMed again before it can be submitted by staff. Some vendors of ILL systems have been in stasis for years, while others have developed automations and technical innovations that have revolutionized how ILL processes requests. Unfortunately, these innovations are too often insular.

They are created without thought to how they can work across systems and across institutions. Furthermore, it is often difficult for services to change current workflows or figure out how to incorporate new functionality. Vendor support and local technical support are paramount if we want to progress to the desired state.

The Current State

Discovery

One of the most non-user friendly pieces of the discovery to delivery process begins at the point at which an item has been discovered.. The challenge each library faces is in how to present a request option without overwhelming the user with multiple possibilities. Unless these choices are enhanced with explanatory text, it is likely a patron will not understand the library service terms, such as Interlibrary Loan, and what each one is actually going to do for them. The BTAA Libraries currently use eight different main discovery platforms: 5 libraries use Primo, 3 use EBSCO, 3 use Proquest, 2 use WorldCat Local/Discovery, and Innovative Encore, VuFind and two different homegrown systems are each used at one library. In addition, requests may be submitted through WorldCat Local/Discovery, via article databases and various consortial catalogs. Due to the array of different platforms and terminology used by each library, the simplification of discovery should be an ongoing endeavor and the sharing of usability testing across institutions may be the best way to find a collective solution.

Fulfillment for Loans

Local Availability: The first level of fulfillment is the locally available and circulating item. Due to the array of starting points for searching of resources, the duplication of bib records for items and the generally complex ecosystem of discovery, users will often request material that is held locally through Interlibrary Loan. Regardless of the delivery mechanism used, locally or via a resource sharing system, the process should be seamless for the patron. However in the current environment, the patron is often faced with too many options for requesting an item, with too little context for understanding the differences among the choices. There should be no expectation that users know the difference between ILL, “Get It”, and/or UBorrow.

Consortial Leverage and OCLC Direct Request: When items are not available locally, consortial availability is leveraged via UBorrow or another consortial system because those systems contain the critical shelf availability information. For the three libraries that do not use UBorrow, other consortial systems are used to fulfill requests in the most timely manner and at the lowest cost.

Patron-Driven Acquisition/ILL Purchasing: Usually selections or routing of requests to Acquisitions takes place during mediation of requests that were not filled through unmediated requesting mechanisms.

OCLC Manual: Finally, general availability/ownership, but not shelf availability, is determined via OCLC. In many ways, requesting via OCLC is blindly sending off a request. Although the majority of

requests are filled by the first lender asked, very long lending strings can be built which may take weeks before the request is ultimately filled or left unfilled.

Circulation: Usually ILLiad Web Circulation - separate from a user's main library account. At some institutions, library staff will manually create brief records to circulate materials in the LSP.

UBorrow Availability Web Service and NCIP Automation

There are current technologies available that enable cross-system communication and integration, however it can be difficult to implement these automations into daily workflows. Libraries question whether it is worth the time and money to implement technologies such as NCIP now when we will be moving our ILL and Document Delivery operations to a cloud-based platform within the next few years. Currently, only Northwestern and the University of Chicago use both the Relais availability web service and NCIP.

The UBorrow Availability Web Service will take any request for an item that contains an ISBN, search the UBorrow catalog and submit the request to available locations via OCLC. If the request cannot be filled via UBorrow, it is automatically sent via OCLC to libraries selected via custom holdings. This is completely automated, and the patron doesn't need to do the searching in UBorrow - it is done for them. When the item arrives, it can be processed with an ILLiad NCIP addon and then circulates via the local LSP. On the lender side, NCIP enables staff to update items to shipped and returned in ILLiad which send messages to the local LSP for checkout and return, eliminating the duplication of tasks.

We encourage libraries to use these available technologies now, in an effort to move towards a unified user account and smart fulfillment, as this is ultimately what is achieved.

Fulfillment for Articles

The discovery process for journal literature is complex not just because of the variety of ways in which these types of publication are created and distributed, but also because of the distributed nature of the discovery tools involved in the process. A library's holdings can be determined by use of a single catalog while journal article discovery is by discipline specific databases. Moreover the process of journal article discovery is further fractured by both disciplinary and discovery-platform user interface idiosyncrasies.

Even when a patron has been able to successfully identify a citation, link resolvers often do not provide a direct path the wanted article. Rather, they often present multiple options for access or require a patron to manually choose the one provider where that year or issue are available. Next a patron is presented with yet another layer where they must navigate the content provider's site to reach the desired article. Alternately, owned content may simply not display because the content provider does not allow for its material to display via link resolvers or does not permit the company that makes the specific link resolver used locally to display their content. Print holdings are discovered via turning the patron to the local discovery layer, introducing yet an additional discovery tool that the patron must navigate, simply to determine if the library owns the volume containing that

article. The delivery process is at best imperfect due to incomplete holdings information both false positives and false negatives. Given the above, it should come as no surprise patrons opt for the ILL link even when content is available instantly from locally-accessible content.

Local Availability: Electronic and print availability within each institution relies on a combination of the local discovery interface and link resolvers. Whether a patron is physically located on campus, has a campus IP address through a proxy server or VPN, or is currently signed in to a library's website severely determines both the patron's access to electronic resources and their request options. Patrons will often begin their research in a general search engine and come to publisher paywall dead ends. Ideally, patrons choose the ILL/Document Delivery option only after they have found that the electronic copy is not available through a library's subscription. Unfortunately, this is another discovery ecosystem that is unclear to patrons and complex to navigate.

Copyright Clearance: The copyright clearance process slows the fulfillment process for articles published in the last five years. Within ILLiad, automations are in place to bypass copyright clearance and send unmediated requests to lenders when the publication date is older than the last five years and the request contains an ISSN.

On-Demand Purchasing: When ILL results in copyright royalty fees, it is common practice to seek out the lowest cost option between document suppliers, publishers, and the Copyright Clearance Center.

Full-Text and Open Access: Identifying a full text and/or open access version of an item is almost always a manual process involving staff time to search various databases and websites.

Rapid: Libraries who use Rapid take advantage of an unmediated, very quick fulfillment of requests or the return of local location and call number which can be used to facilitate document delivery.

OCLC: While the OCLC Direct Request feature is also unmediated, it does not come back with a library's location and call number when material is available locally in print. It will, however, come back with a link indicating potential online access if a library has loaded their holding in the OCLC Knowledge Base. Again, OCLC requests may then be submitted to other libraries without knowing another library's actual holdings or licensing agreements. The OCLC KB is not used by all libraries and has not created the efficiencies expected, for many libraries, as intended when it was first released.

In Short

Patrons' experience under the current state reflects the organization of where and how information about resources is held and the many different systems, resource states, and workflows used to obtain access to or to deliver resources to patrons. The experience has a library-centric feel; the patron workflows and language used in the interfaces reflect library needs and practices, not those of the patron. And while it has had this orientation ever since libraries grew large enough to require lists of resources and guides to where they are shelved, the experience today has become complex.

Successful navigation of this thicket requires patrons to have some insight into how libraries are organized in themselves and in their consortiums and to some extent how they function within the larger ecosystem of scholarly communication and publishing.

The Desired State

We aim to reduce the complexity of this experience by enhancing our discovery platforms to answer more directly the patron's question "Can you get this book or article for me?" We aim to shield the patron from the details of delivery. If the patron cannot walk up to the shelf and find the book, it does not matter whether the library obtains the book from another library on campus or from remote storage, from a library in one of its consortiums or elsewhere, or through a purchase. All that matters is format, time to delivery, loan period, and costs to the patron, if any. In the desired state, asking for this book or article should not require different steps routed through different systems, each with its own quirks of organization and behavior, depending on whether the library owns or has licensed the resource or not. The discovery platform should be able to declare for a requested resource, "it is available immediately here," "we can have it delivered to your pickup location or email address in two days," "we can scan and send you a copy of a short section of the book for a \$2.00 fee," or "we don't know at this point whether we can get this item for you, but we will investigate and have an answer for you by Tuesday."

In the desired state, a researcher who uses a citation manager should be able to submit a citation to the discovery platform or enter one directly, and if the citation is full enough to resolve to a manifestation of the work, the platform together with backend fulfillment systems, should be able to arrive at one or more of these answers to present to the patron as options. And the options should be informed by what terms of use and fee structures apply to that particular patron; only options applicable to the patron are presented. The answers may be ordered by library fulfillment policies and preferences given the realities of where in fact the resource is available, but options are expressed entirely in terms of factors that matter to the patron. Roughly equivalent options in these terms are collapsed and presented as one.

In the desired state, backend systems know who the patron is because he authenticated to the discovery platform and these systems talk and share information as one might reasonably expect.

In the desired state, a patron sees her loans, requests, and fees gathered together into a single interface for her library account. While these may be managed by several backend systems, the patron does not need to know or care about that. She only wants to know what is due when, can she renew it, when is the item requested going to show up, and so on.

And finally, in the desired state, libraries, through their systems, keep patrons informed through channels of the patrons' choosing.

From the librarian's perspective, in the desired state, most of the decision making about what delivery options to present is automated in accordance with library fulfillment policies and preferences. Most

patron actions in exercising an option do not require mediation for the request to be routed. The same consolidated account views for patrons are available to library staff. Library systems support the notion of a delegate who acts on behalf of the patron to select and initiate a delivery option. And library systems give librarians a view into processing details and states that have been hidden from the patrons but are essential to investigating the status of a patron's request for service when things get stuck.

Architectural Implications

In the guiding vision for this report, our patrons can easily and quickly find an answer to the question "Can I access this resource--book, journal, article, digital object--through my library?" The answer, if yes, will clearly lay out what to do to access the resource, indicate format choices and likely delivery times and loan periods, and declare any costs. Depending on their library's service offerings, there may be several options for patrons to select among, and the answer will describe in terms relevant to patrons the advantages of one option over another. This vision does not imply that there is a single interface for asking this question, but it does imply that the next steps towards finding the answer are clearly marked and that the number of steps is few.

Libraries and library vendors have adopted a web scale discovery strategy in recent years that goes some ways towards an easy and quick answer to this central question. If patrons can find an item through the single search box, then the library can provide access to it (subject to terms-of-use). However, we know that much of our patrons' discovery begins someplace other than in our primary discovery platforms. And, of course, we provide access to many resources we do not own or have licensed. Finally, the imbalance in collections budgets compared to faster-than-budget increases in publications costs has driven us to shift from a just-in-case acquisitions strategy to a more use-based borrowing approach. We see this reflected in emerging cooperative collections development strategies and the implied ILL activities that will power them. The upshot is that many of the items our patrons need, and that we can deliver to them, cannot be discovered in our discovery platforms. It's also worth noting that some of the time a patron will not find an item through our discovery platform when we in fact own or license it.

These facts and trends imply that simply consulting our discovery platforms will not always answer our patron's question. What might we do to improve that? And what does this imply from a system architecture point of view?

Citation Handling

Let's begin with an assumption: Wherever discovery occurs, a patron can create or capture a citation to the resource she needs. How full the citation needs to be to resolve reliably to an item that meets her needs depends on the number of manifestations a cited work has. But, let's assume that the patron has formed a full enough citation that often an algorithm can successfully resolve to a satisfactory item and that in any case a librarian can use the citation to select and deliver an item that satisfies the patron's needs.

Let our discovery platform accept such a citation as input. We can easily imagine mechanisms that support this, for example:

- The patron completes a form with fields corresponding to the major components of the citation. (See ILLiad.)
- The platform accepts OpenURLs as input.
- The patron copies a citation in popular standard formats and pastes it into input box. The citation is parsed into its component fields.

Fulfillment Options

The discovery platform uses the parsed citation input to attempt to resolve to a specific resource. If successful, it calls out to fulfillment systems to determine what fulfillment options are available. These options are determined by the item itself. If it is locally owned or licensed, they could include a call number and “in place” status declaration, a link to an online resource, or an option to have a digitized section of the resource created and delivered to the patron. If the library does not own or license a suitable item--the search is unsuccessful, or if the item is not presently available locally, the patron is presented with the option to have the library attempt to find the item for her. (We could imagine always providing this last option together with a field for qualifying the request along the lines of “this is the book, but I really need the latest (3rd, I think) edition.”)

Fulfillment systems here mean library services platforms that support physical materials delivery and loan management, link resolution to electronic resources, and digitization services, and interlibrary loan systems that locate, request and deliver items borrowed from and/or digitized by other libraries. We imagine the options offered by these systems aggregated and presented to the patron through the discovery platform. Each option is presented along with a description of what the patron should expect in terms of format, delivery date, loan period, and costs.

Once the patron has selected an option, the library has the discretion to deliver the item however it sees fit so long as the expectations set when the option was presented are met. It may be that whether the library can ultimately deliver a suitable item to satisfy the request remains an open question at the time the request is made. And it may be that the library will need to pursue other options which in effect do not meet the original expectations. We will come to communication and messaging below.

In this scenario the library’s discovery platform provides the interface for getting an answer to the question we started with--“can I access this resource through the library?” Let’s enumerate a couple of architectural considerations for this approach.

In this approach, fulfillment systems that calculate the options available to the patron can and typically do run independently of the discovery platform. We require only that the discovery system can request options for the fulfillment system and actionable information is returned along with a means of determining expectation characteristics for each option. Actionable information means that

the discovery platform can use the information to present an action that can be initiated by the patron in the discovery platform's interface. Expectation characteristics could be explicitly declared by the fulfillment system, e.g. expect delivery in 2-3 days, or sensible defaults could be configured and displayed within the discovery platform.

This approach does not require that the systems that calculate the options available to the patron are brought together into a single system or even that they function in a coordinated fashion. LSP and ILL systems service options requests independently: the LSP checks local availability and reports local fulfillment options; an ILL system such as UBBorrow (Relais) checks availability in the BTAA consortium. Ideally, for each option a status is declared--Is/Is not available through this channel. The discovery system can then elect to display an option based on this status without having to execute business logic that is informed by how the fulfillment channel works.

An architectural principle here is that the discovery platform knows nothing about fulfillment options beyond how to display a sequence of options and to render the mechanism for initiating the option. This could be easy to accomplish if a standard for representing fulfillment options, including expectation characteristics, were developed and adopted in the library and library systems communities.

Note that the discovery platform's decision about which fulfillment system to consult may be determined by resource type, e.g. print vs. electronic or circulating vs. non-circulating. When configuring the discovery platform each fulfillment system is matched to resource type. If a discovery system supports citation-style request handling for resources not included in its discovery domain as described above, only the ILL system would be queried for fulfillment options.

It's also worth noting that this approach does not address the issue in which a patron's status in one fulfillment system, e.g. a service block, should be reflected in the service or denial of service offered in another fulfillment system; unresolved fines in the LSP should prevent the ILL system from accepting requests, for example. That sort of business logic falls outside of the simple rendering of options belongs in coordination integrations between backend systems.

Accounts and Messaging

From the patron's point of view, the backend system(s) that manages loans, requests, and other transactions is not important. What is important to the patron is having easy access to all of this information. To achieve a unified view of a patron's account, it is not necessary that a single fulfillment system manage these transactions. However, a single patron library account application could manage the presentation so long as the transactions can be gathered from the managing fulfillment systems, and these transactions along with associated actions such as loan renewal or request cancellation are presented with the account application.

Like fulfillment options and associated actions described above, standardization in this area would be useful. Again, the architectural principle that separates business logic from presentation applies here.

The pattern for account status and actions display is essentially the same as the one for fulfillment options and actions.

Messaging related to fulfillment transactions, particularly those about transaction status and actions required by the patron, can be generated by backend fulfillment systems. However, messaging preferences should be managed by the account application. These preferences should then be propagated to supporting fulfillment systems. Again, standardization in this area would be useful.

Notes on System Features

We close this section on system architecture with a few notes on system interoperability features that would contribute to building out a discovery-to-delivery ecosystem that achieves the central vision.

- The discovery platform accepts known item citation data as input and provides fulfillment options through ILL, acquisitions, document delivery, etc., even when the resource is not presently owned or licensed by the library.
- The LSP and ILL management systems provide APIs suitable for use by a discovery platform for evaluating and reporting availability and delivery options, and for accepting patron initiated delivery option execution. The APIs should be able to accept as input standard resource identifiers, e.g. ISBN, ISSN, and OCLC accession numbers, in addition to internal identifiers.
- Requests that cannot be satisfied in one system can be automatically handed off to another (local catalog to Relais to OCLC) without staff intervention.
- Real-time delivery status information can be tracked through fulfillment systems, in coordination with shipping partners, e.g. UPS, FedEx, USPS.

Recommended Actions

We now shift our attention from the first bullet of our charge -- in effect, answering the question, “What is to be done to improve the experience of our patrons?” -- to the second and third bullets, the practical things BTAA libraries can do in the near term to move us toward the desired state.

What we can do in the near term is a function of the present capabilities and limitations of the discovery and fulfillment systems we use. Frankly, the desired state cannot be fully implemented in the present because the required functionality does not exist in the right form in each of these systems, although some aspects of the functionality exist in part. For example, real-time availability and delivery option execution between discovery platforms and LSPs exist, but the analogous functionality between discovery platforms and ILL platforms does not. Accepting a citation format exists in ILLiad and link resolvers, but does not exist in the discovery platform. Account data are exposed through APIs in some fulfillment platforms and not in others.

We recommend three areas for action:

1. Exert influence on future product development. While we are limited in our ability to implement the desired state today given the state of the systems at play in this space, we are in a position to influence the direction future development of these systems takes. Promoting this vision to other consortia and large research libraries would broaden this influence.
2. Make full use of the currently available technologies and best practices.
3. Experiment with user experience design and behaviors, and share usability findings.

Exert Our Collective Influence on Our Vendors

Ensure vendors are aware of our needs and that they are actively working toward a better experience for our users.

OCLC

- Continue discussions with OCLC to ensure their new ILL Platform meets the BTAA's needs as outlined in this document.
- Ensure that the new platform is open and flexible allowing for an equivalent customization mechanism and openness for development as exists with ILLiad addons.
- Ensure that we continue to have uninterrupted BTAA representation on OCLC Cloud-Based System Advisory Groups.

Relais

- Continue to press Relais for development of the delivery web services so they support more than ISBN searching.
- In cooperation with the Ivies Plus and GWLA, explore mechanisms to transfer requests between different Relais systems and architectures.

Proquest-Ex Libris: Alma/Primo and Summon

Currently five of the BTAA libraries use Alma/Primo as their LSP and discovery interface, and it is likely that more of the BTAA libraries will move to Alma in the coming years. And three members use Summon.

- Primo has a new UI under development and the look and feel is very clean and modern. Now would be a good time to suggest improvements in how delivery options are presented to users and to explore innovations in pop-ups and expanding and collapsable choices for users.
- Press Ex Libris on the need for full NCIP capabilities and interoperability with external ILL systems.
- Ensure that we have BTAA representation on Product Working Groups at ELUNA and participation in the Alma Enhancement Process.

Promote the Vision beyond BTAA

The vision we have outlined in this report is general and applies to all libraries like ours. Promoting the vision to consortia like BTAA and to large research libraries could add voices to our call for enhancements in our vendors' discovery and fulfillment platforms. When opportunities arise for

sharing this report with vendors, presenting at conferences, and consulting colleagues affiliated with other libraries and consortia, we encourage our members to do so.

Smart Fulfillment

This section describes system changes that would improve fulfillment functionality over its current state as an intermediate step towards the integrated architecture outlined above.

Once a request is placed, a request management system will take over to provide smart processing of the request. While progress has been made in this area with the introduction of the UBorrow APIs for automated requesting, more work is needed, particularly on the part of the vendors who supply the products used across the BTAA. Atlas Systems must continue to develop ILLiad and its associated APIs with the flexibility Addons allow. Alternately, OCLC must develop its new system to provide a baseline of equal and equivalent functionality to what ILLiad provides us now but also a forward looking open platform we can customize. This development provides the greatest opportunity to improve the delivery system and advance the goals of this project. The BTAA should strongly advocate for such functionality from OCLC.

The request management system will require development of four areas of increased functionality to send or route a request.

1. First, new mechanisms for patron provisioning of the ILL system need development. The Alma User APIs are an example of a tool that can provide this data and moves us away from duplication of patron data across systems.
2. Second, local automated searching of shelf availability needs to be developed. While automated Z39.50 searching exists in products like IDS Logic, Z39.50 is reaching the end of its functional lifespan and does not provide the full functionality needed. Robust development of new mechanisms such as availability APIs that allow for searching using ISBNs, OCLC numbers, and key word searches need to be developed by vendors. EXLibris' availability API for Alma is not sufficiently robust as can only work based on the internal identifying number, the MMSID.
3. Third, a mechanism to initiate patron-driven acquisitions rather than defaulting automatically to ILL borrowing should be included. Likewise, an automated mechanism for recalls need to be developed. YBP's Gobi API is an example of how patron-driven acquisitions could be automated as long as the ILL management system has sufficient logic built into it to route such requests through item records and patron holds in the LSP would also need to be created. Recalls present more challenges for integration.
4. Fourth, mechanisms to transmit requests to a consortial borrowing system for fulfillment outside the local collection, and if the item is not available in the consortia, automatically forward the request to a subsequent system or systems. This routing functionality for items with ISBNs exists within the Relais delivery web services used in UBorrow. We need to continue to push Relais for further development to these services. Interoperability between shared catalog consortial systems like Voyager or Alma and other systems such as ILLiad has not yet been developed but will need to be. The process above will create the request,

associate it with a patron and provides mechanisms for that request to be routed appropriately.

When the request arrives at the potential lending library, the following needs to happen:

1. First, an unmediated mechanism to produce pull slips/labels should run. This functionality needs development by vendors.
2. Next when an item is ready for shipping, the system needs to update the request to shipped status
3. The item record in the local LSP needs to be updated
4. The request number in a UPS/FedEx tracking record is recorded
5. The system needs to notify the patron that the item is on its way.
 - a. Updating in the local system should be part of NCIP integration between the request management system and the local LSP. This is partially implemented at a select number of BTAA libraries.
 - b. Communication about tracking and tracking information in general can be gather via APIs and though no request management system has this functionality at this time, it should be developed by the vendors.

When the item arrives at the borrowing library, a mechanism to receive and route items is needed. This part of the process involves a combination of more advanced processing than ILLiad currently provides but OCLC's new platform must include, especially the UPS/FedEx integration for shipping status via API. BTAA wide adoption of NCIP will provides integration with the local LSP so that ILL loans are handled just local circulations for tracking, patron notifications, circulation, overdues, renewals and the like. Returning and tracking the item is the above shipping process in reverse and uses the same tools as above.

Implement Current Standard Practices

The BTAA libraries should be making use of the current available technologies that facilitate quick turnaround time of patron requests and create time-saving efficiencies for library staff in both borrowing and lending. There should be a commitment on the part of staff at each institution to use the technologies we invest in.

1. **NCIP:** The NISO Circulation Interchange Protocol (NCIP) is a standard protocol used to facilitate the automated exchange of information between an ILL system and a library services platform in order to circulate all items in one place. NCIP is already built into the Alma environment and hence is no additional cost to Alma libraries. While the straightforward circulation of ILLiad items in Alma is successful, development is needed for the submission of borrowing renewal requests initiated within Alma and recalls initiated by lending libraries in ILLiad. Other LSPs may need an external NCIP add-on in order to circulate ILL transactions. The automated circulation of ILL transactions within a patron's unified library account should be one of our strongest endeavors.
2. **Relais Find Item Web Service for UBorrow:** All Loan and Book Chapter requests containing an ISBN go through the UBorrow Web service. This service leverages the availability and load

leveling of BTAA libraries, facilitating unmediated requests for the borrower and location and call number verification for the lender.

3. **UBorrow Borrowing Addon:** This addon is used to quickly and easily send requests to the BTAA library partners, again leveraging availability and verification for the lender.
4. **Provide Access to Distance Users and those with Disabilities:**
 - Expand Interlibrary Loan and Document Delivery services to distance users whenever possible -- consider off campus shipping of loans and scanning of local material.
 - Scanning software that is used for document delivery and ILL should support OCR scanning. See [Appendix C](#) on this and other current trends and unaddressed needs.

Experiment and Share User Studies and Usability Testing Results

One of the recommendations for action in this report is the development of a platform neutral “get it” functionality to initiate the delivery process. It is widely believed that if we simplify the option for users and use smart fulfillment behind the scenes, this will improve the user experience. If we have evidence through user studies that this is what users want, we should be documenting and sharing these testing results. To facilitate this need, we recommend:

- A commitment by all BTAA Libraries to report out on user studies and make this an evolving approach so we can all benefit from what our colleagues have learned.
- Create an inventory of User Studies - including strengths and weaknesses in the current environment.
- Create an inventory of systems/processes used to facilitate these studies.

Recent Studies

Group member Zoe Chao, the User Experience Librarian at Penn State University, conducted two ILL and recall usability sessions with small groups of users in October 2016. Her first session focused on the question: what do the current two request options, “I want it” and “Request,” mean to students? Her second session focused on: will students choose differently if there are brief context for the two options? Results of her two sessions can be found in [Appendix A](#).

The University of Michigan will begin a user study later this fall to explore how their campus understands the document delivery/pulling and scanning service; this exploration may extend into their other delivery services as well. This report is likely to be released in early 2017. Currently, the University of Michigan catalog discovery interface has one “Get This” button which then expands into collapsable choices for Recall, ILL, or Request to have a small portion scanned. While these choices include heavy verbiage, the patron knows exactly what they are requesting and clear indications of how long it will take. See [Appendix B](#).

Experimental Application for Improved Discovery and Capture of Resource Metadata

We envision a browser application open to all BTAA library systems which will capture resource metadata anywhere, authenticate the user, and run the resource through the library’s link resolver giving them access to the full-text or the ILL/Get It option - all in one click of the browser app.

This Zotero-like tool should display only to patrons with access to the delivery service. This will need to be developed within the BTAA and will require some mechanism, preferably not OpenURL but rather ISO 18626, for request submission.

Conclusion

We have described a desired state in which our patrons can more simply find an answer to the question: Can I get access to this resource through my library? We have outlined an approach that requires incremental changes in existing discovery and fulfillments system to unify the patron's experience and to improve interoperability and coordination between otherwise independent components of the discovery-to-delivery ecosystem.

Full implementation of the desired state requires enhancements to existing systems and appropriate functionality in OCLC's new ILL platform. While we cannot yet implement, we can influence and should continue working with our vendors to promote and achieve this simpler, patron-centric view of library discovery-to-deliver services.

Appendixes

Appendix A

Penn State University User Studies

Background

At the Penn State University Libraries, there are two fulfillment/delivery options displayed in the item record, “I want it” and “Request,” regardless if the item is checked out or not (see Figure 1). If the item is available at the Libraries, either option will result in placing hold on the item. If the item is not available, the recall process will be initiated with the “I want it” option or an ILLiad request will be placed with the “Request” button. In most cases, “I want it” will take longer for users to receive the item than “Request.”

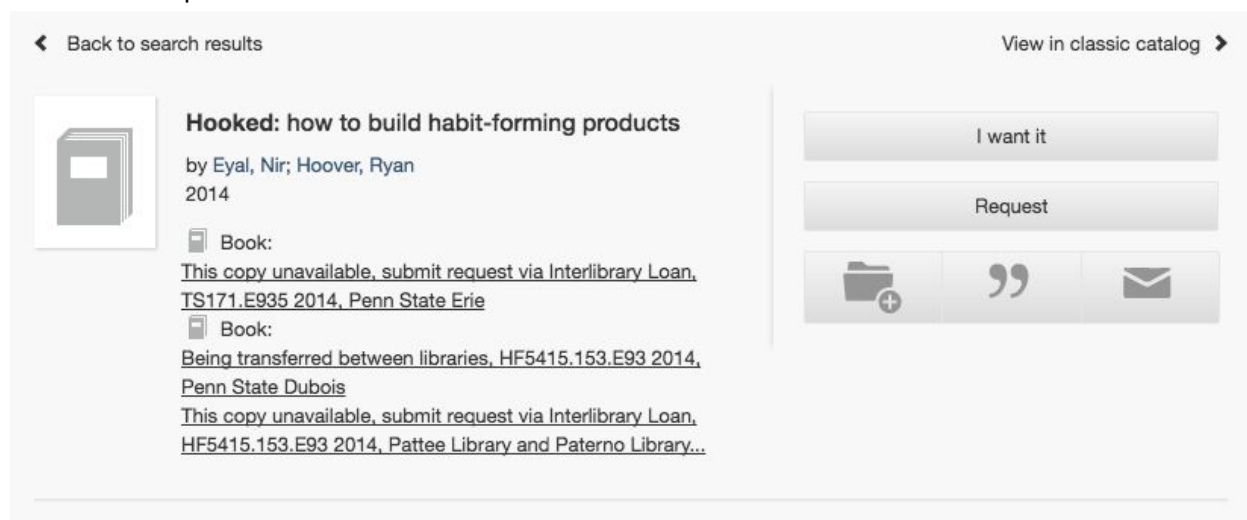


Figure 1. The record of an item owned by the Penn State University Library in Summon, the discovery system.

Session 1

Task for users:

Try to find and borrow the book “Hooked: How to Build Habit-Forming Products” by Nir Eyal. (All the copies of this book are currently checked out from the Penn State University Libraries.)

Results:

A total of ten students participated in the user study. All of them were able to locate and borrow the item. However, none of them knew the difference between the two buttons: “I want it” and

“Request.” Seven students clicked “I want it” mainly because they had the impression that they would receive the book sooner with this option. Three selected “Request” because it sounded less demanding or it sounded more guarantee to get the book.

Session 2

Tasks for users:

1. Try to find and borrow the book “Hooked: How to Build Habit-Forming Products” by Nir Eyal.
2. Compared to our current record display (Figure 1), which one from the following three mockups (Figure 2, 3, 4) that you think is the most helpful when you are borrowing the book?

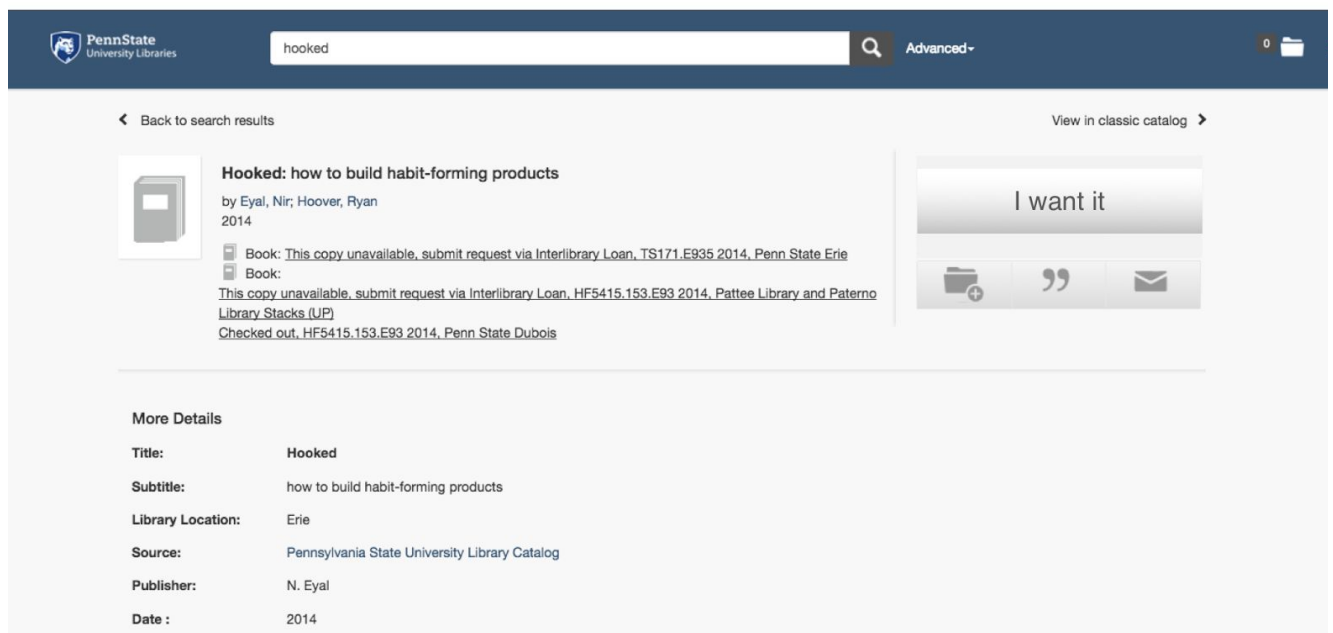


Figure 2. The mockup of item record with only one option “I want it.”

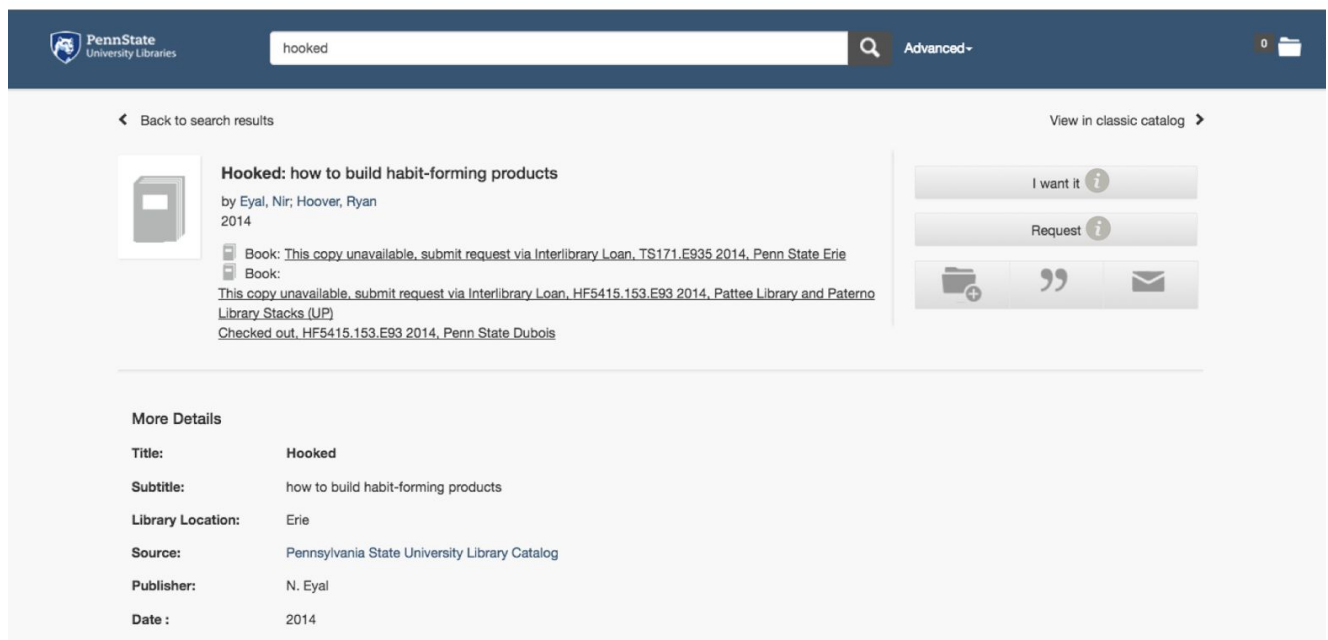


Figure 3. The mockup of item record with two options “I want it” and “Request,” with info icons.

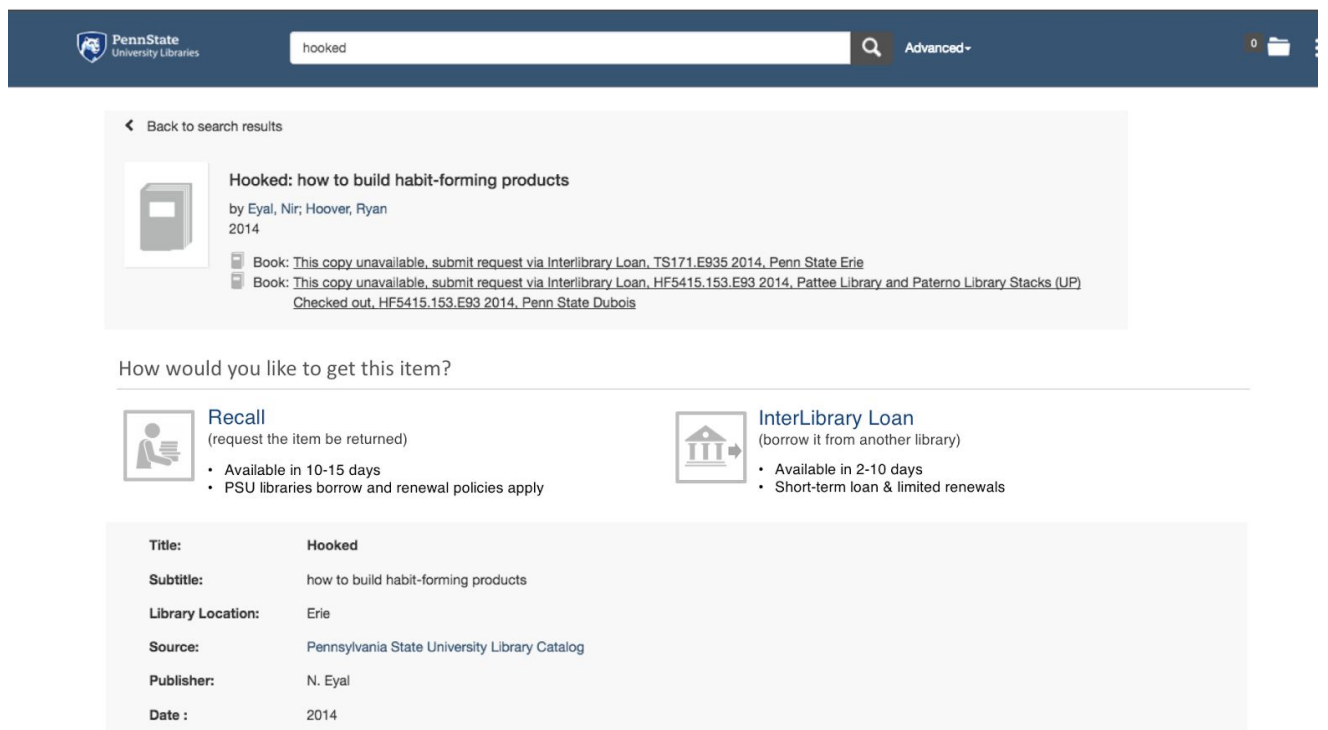


Figure 4. The mockup of item record with two options with brief explanation of the timeline and policy.

Results:

A total of seven students and four librarians participated in the test. Similar to Session 1, none of the students knew the difference between the two delivery options. When asked about their preferred layout, one student chose Figure 2, one student chose Figure 3, five students chose Figure 4. Six students confirmed that the explanation in Figure 4 changed their perceptions of the two options and would influence their decision on which link to click. As for the librarians, three out of four prefer one button.

Appendix B

University of Michigan Request Options in Discovery

1. User sees the record

The screenshot shows a library catalog record for the book "Hooked: how to build habit-forming products" by Nir Eyal and Ryan Hoover. The record is displayed in a clean, modern interface. At the top, there are navigation links: "Back to Results", "Previous record", and "Next record". Below these are buttons for "Cite this", "Text this", "Email", "Export to reworks", and "Export to Endnote". A "For Selected items (0):" section includes links for "List", "Email", "Export", "Clear", and "Save Selected to Favorites". The book's cover is shown on the left, featuring the title "HOOKED" and the author "NIR EYAL". The main title and authors are listed at the top of the record. Below this, a table lists the main author, contributors, format, language, and publication information. The "Holdings" tab is selected, showing the location "Hatcher Graduate — Basement North" and the call number "HF5415.153 .E93 2014". The "Checked out" status is "due Dec 23, 2016 at 11:59 PM". A "Get this" button is visible at the bottom right.

Back to Results
Previous record Showing record 5 of 260 Next record

Cite this Text this Email Export to reworks Export to Endnote For Selected items (0): List | Email | Export | Clear | Save Selected to Favorites

Hooked : how to build habit-forming products / Nir Eyal with Ryan Hoover.

Main Author:	Eyal, Nir, author.
Contributors:	Hoover, Ryan, author.
Format:	Book
Language:	English
Published	2014 New York, New York : Portfolio/Penguin,

Save to Favorites

Holdings Description Subjects Table of Contents MARC View

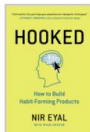
Hatcher Graduate — Basement North **i**

HF5415.153 .E93 2014 Checked out: due Dec 23, 2016 at 11:59 PM Get this

2. If the user wants the item that is not available, clicks the “get this” button and sees appropriate delivery options

How would you like to get this item?

Hooked : how to build habit-forming products /



Author: Eyal, Nir,
Format: Book
Call number: HF5415.153 .E93 2014
Owning library: Hatcher Graduate
Item status: Checked out: due Dec 23, 2016 at 11:59 PM



Recall it (request that this copy be returned)
Library-to-Library

- Expected availability 1-3 weeks*
- Standard loan and renewal policies apply



Request a copy from another library
Interlibrary Loan (I.L.L.)

- Expected availability 6-10 days*
- Short-term loans
- Limited renewals



Request to have a small portion scanned
Interlibrary Loan (I.L.L.)

- Expected availability 1-10 days*
- Requests for portions are individually evaluated for copyright compliance
- Your requested portion will be available to you on a secure website for 2 weeks

[Back to full record display](#)

Check UBorrow for faster delivery

Check the [UBorrow catalog](#) to see if you can get this item for 12 weeks with 1 renewal. Expected availability in 5 days.

Frequently asked Questions

How do I change my Interlibrary Loan or 7FAST delivery location? You have to call or email the Interlibrary Loan office.

How will I receive my material?

Receipt of your material depends on the service you select.

- If you request it for pickup, place a hold on it, or request it to be returned, the loan is delivered to the library of your choice.
- If you request a scan, your scan will be delivered electronically. You will receive an email containing a link to ILLiad when a PDF is available.
- If you request a copy through Interlibrary Loan, loans are delivered to your departmental mailbox or to any I.L.L. pick-up location.* Read more -->

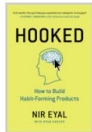
[Read more FAQs about document delivery options](#)

[Ask a Librarian](#)

3. User can expand (click the “+”) to see relevant details and start the appropriate process. The ILL “next” buttons go to the appropriate screen in the ILLiad interface (for whole book; for a section).

How would you like to get this item?

Hooked : how to build habit-forming products /



Author: Eyal, Nir,
Format: Book
Call number: HF5415.153 .E93 2014
Owning library: Hatcher Graduate
Item status: Checked out: due Dec 23, 2016 at 11:59 PM

Recall it (request that this copy be returned) Library-to-Library

- Expected availability 1-3 weeks*
- Standard loan and renewal policies apply

Pickup Location:
Cancel this hold if item is not available before:
12/10/2016

* A new due date will be given for this item.

Recall this item!

Request a copy from another library Interlibrary Loan (I.L.L.)

- Expected availability 6-10 days*
- Short-term loans
- Limited renewals

By default, items are delivered to Hatcher Graduate Library.

To set your delivery preference to your departmental mailbox, contact the I.L.L. office.

>> Check your current delivery preference

* Availability, checkout periods, and renewals depend on the lending institution.

Check the [UBorrow catalog](#) to see if you can get this item more quickly.

Next →

Request to have a small portion scanned Interlibrary Loan (I.L.L.)

- Expected availability 1-10 days*
- Requests for portions are individually evaluated for copyright compliance
- Your requested portion will be available to you on a secure website for 2 weeks

Requests for scanning are individually evaluated for copyright compliance.

If the requested portion cannot be scanned because doing so would violate copyright law, the volume will be delivered physically to a departmental mailbox or to a University Library pick-up location.

* Availability depends on copyright and other factors.

Next →

Check UBorrow for faster delivery

Check the [UBorrow catalog](#) to see if you can get this item for 12 weeks with 1 renewal. Expected availability in 5 days.

Frequently asked Questions

How do I change my Interlibrary Loan or 7FAST delivery location?
You have to call or email the Interlibrary Loan office.

How will I receive my material?

Receipt of your material depends on the service you select.

- If you request it for pickup, place a hold on it, or request it to be returned, the loan is delivered to the library of your choice.
- If you request a scan, your scan will be delivered electronically. You will receive an email containing a link to ILLiad when a PDF is available.
- If you request a copy through Interlibrary Loan, loans are delivered to your departmental mailbox or to any I.L.L. pick-up location.* Read more -->

[Read more FAQs about document delivery options](#)

Ask a Librarian

Back to full screen display

4. If the book is on the shelf:

How would you like to get this item?

Hooked /



Author: Kael, Pauline.
Format: Book
Call number: 808.29 K115hn
Owning library: Hatcher Graduate
Item status: **On shelf**

Find it in the library Self-Service

- Immediate access to a physical copy when library is open
- Find related items on shelf
- Staff assistance available on site

Pick it up at a library Library-to-Library

- Expected availability 1-3 days
- Standard loan and renewal policies apply

Pickup Location:

Cancel this hold if item is not available before:

Can't find your book on the shelf? Request it for pickup, and we will search for it.

Get me this item!

Have it delivered 7FAST

- Expected availability 2-4 days
- Standard loan and renewal policies apply

Items can be delivered to your departmental mailbox or to a library.

To set your delivery preference to your departmental mailbox, contact the ILL office.

>> [Check your current delivery preference](#)

Microfiche scanning and delivery are not free.
[Read more in the 7FAST FAQ.](#)

Next

Request to have a small portion scanned 7FAST

- Expected availability 1-4 days
- Requests for portions are individually evaluated for copyright compliance
- Your requested portion will be available to you on a secure website for 2 weeks

Requests for scanning are individually evaluated for copyright compliance.

If the requested portion cannot be scanned because doing so would violate copyright law, library staff will contact you with other options.

Microfiche scanning and delivery are not free.
[Read more in the 7FAST FAQ.](#)

Next

Appendix C

Emerging Trends and Unaddressed Needs

We include a brief list of trends and patron needs that are not addressed in this report, but that are related to discovery to delivery issues and that may be useful areas of future work.

- Proxies - Because authentication systems authenticate individuals, delivery systems do not allow for proxies or assistants. The person who needs the item has to either place the request themselves or share their credentials. We need a mechanisms where research assistants or others can place request on behalf of someone else.
- Group or collaborative work by students - ILL and circulation assume a one-to-one relationship between items and patrons. This model does not fit contemporary practices and instructional practices. A mechanism needs to be developed to allow multiple authorized users to view the same documents.
- Sharing amongst co-authors - Again, the assumed one-to-one relationship between items and patrons does not reflect the reality of patron's interactions with and use of library materials as they participate in the the scholarly communication process collaboratively.
- Course reserves or other material use - Current ILL and document delivery service models assume items will be used by a single individual for study or in the production of new knowledge.
- Integration into tools to create and/or manage bibliographies - Library delivery systems need to integrate more seamlessly into the research process. A patron who has identified items that he or she needs, should be able to upload these into a library request function from their chosen citation management tool.
- A standard in ILL and Document Delivery for meeting the needs of those with disabilities and materials needed for teaching and learning. OCR (Optical Character Recognition) is software that recognizes and interprets text in an image and converts it to text that a computer can read. ILLiad's Electronic Delivery software will retain OCR PDF files upon delivery to users and borrowing libraries if the originating document has been OCR'd. Running OCR on a file has benefits that include:
 - Searchable text
 - Copy and paste capabilities
 - Text to speech capabilities
 - Screen reader compatibility

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Next Generation Resource Delivery: Management System and UX Functional Requirements

Report of the BTAA Discovery to Delivery Project Action Committee

August 21, 2017

Submitted by

Bruce Barton University of Wisconsin-Madison

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Kurt Munson Northwestern University, Chair

Executive Summary

The Big Ten Academic Alliance Discovery to Delivery Project Action Team (D2D Action) submitted its report [A Vision for Next Generation Resource Delivery](#) on November 17, 2016. On February 7, 2017 staff from BTAA libraries participated in a conference call organized by Dean Barbara Dewey from Pennsylvania State University. After that call, a new committee was formed to write functional requirements required to support the outlined vision.

The November report envisions a discovery to delivery process where the library's principal discovery tool answers the patron's question, "How can I get this item through my library?", in a simple and straightforward way. Even when the known item cannot be located in or resolved to via the principal discovery tool, it should still be possible for patrons to ask this question. In this vision, the mainline discovery tool seamlessly incorporates ILL and document delivery as tools to resolve how the item can be delivered post discovery.

We acknowledge that sometimes the answer to the "how can I get this" question above is complex. It may involve several delivery options and associated trade-offs for both the patron and the library. Our goal is to sketch ways in which we can empower patrons to make more informed delivery decisions. We envision an interface that gently guides patrons towards the library-preferred best practice delivery options most suited to their population while providing those patrons with expanded opportunities to communicate the urgency of their need and how important they consider the item. In other words, the delivery choice interface presents a smart, customized set of user-specific options.

Behind this interface we envisioned smart integration of fulfillment systems that would improve the service we provide to our patrons while helping us manage our costs. Smart fulfillment means intelligent, rule-based request routing to the appropriate fulfillment system. The factors to weigh include resource format, delivery time, costs, and the patron's delivery requirements.

Equally important is the development of a robust patron account interface, a My Account page, where patrons can manage all their library transactions--their loans and requests, as well as a list of known items they have discovered but not yet acted on. Regardless of which backend library staff system or workflow is assigned the delivery task, all of a patron's requests, loans, delivered documents and saved records of interest should display together in the patron's personalized space. The system should also provide real-time request status information including next steps and options. We envision an improved, coordinated communication-rich patron experience in which updates on fulfillment status are delivered through the patron's preferred communication channel.

The November vision report was light on detail. This report provides some of the details needed to make the vision a reality cooperatively with our vendors. The functional requirements we

outline here are abstract descriptions rather than detailed specifications or designs. We believe that, at this level of design and behavioral specifications, many approaches are possible. Identifying the most effective approach will depend crucially on contextualizing its presentation within a given discovery platform. Vendor usability teams in collaboration with library early adopters will sort out the low level details. Similarly, the integration architecture for smart fulfillment and the details of protocols and APIs for systems integration are best left to builders of the systems in collaboration with partner libraries. We advocate for open APIs so that systems libraries build support their local customizations and the tools can interact within these complex environments.

The delivery functional requirements described below were developed cooperatively with input from a number of other libraries and consortia outside the BTAA with additional input from the BTAA ILL directors group. The discovery functional requirements have not been shared with or commented upon by others yet. This report should be shared with any patron facing groups, such as reference or instruction, within the BTAA as well as any groups responsible for discovery layer development or system integration so those groups can comment.

Ultimately, this report should provide a starting point for a conversation between vendors and libraries with the goal of improving patron's discovery-to-delivery process. To achieve this, the report must be public, discoverable and widely shared. Endorsements from other groups should be encouraged. Larger in-person meetings consisting of both vendor representatives and library staff would provide opportunities to explore practical pathways to implementing the ideas outlined below.

Charge

- Document resource requirements based upon the Vision for the Next Generation Resource Delivery: report of the BTAA D2D Committee Action Committee.
- Deliverable: Report detailing functional requirements of a next generation resource delivery management system and discovery UX.

Introduction

Usability testing has demonstrated patrons find the existing discovery to delivery process difficult to navigate. Our library backend systems are isolated from each other, therefore request management is challenging and requests are often duplicated. Patrons lack a single "my account" page or place to manage all of their library transactions and staff must switch between multiple systems to manage a single patron request.

We begin by exploring the discovery layer. We describe the most common inputs to a discovery layer, present ideas of how delivery options could best display for the patron, and discuss how

the display of these options should be constructed based upon locally defined best practices and service decisions.

A serious weakness in our current patron interfaces is the lack of a unified patron dashboard or place where patrons can see and manage all of their library transactions in one place. Such a “My Account” function must be developed and vendors must provide such functionality in a vendor and platform neutral way. Furthermore, they must permit the extraction of request data from their system for display in another vendor’s patron interface. Patrons do not want and are confused by siloed patron interfaces built on backend library systems. These do not provide good customer service and must be abolished.

Finally, we describe the functional requirements for a robust forward-looking resource delivery management system. We envision a platform that manages requests primarily by making calls to other systems, routes items as needed, and does not duplicate other library systems’ functionality, particularly circulation functions. These requirements emerged from the November report’s recommendations, the February 24, 2017 [Vision](#) document and Kurt Munson’s efforts to coordinate BTAA, Ivies Plus and GWLA’s efforts to define and document our common needs and expectations. Since all research libraries share these common needs, particularly in resource delivery, speaking with one coordinated voice will provide needed clarity. Thus we can focus vendor development so their products will meet everyone’s needs.

Next Generation Discovery UX - Functional Requirements

The library’s principal discovery platform

A library’s principal discovery platform supports the discovery and some fulfillment UX components for articles, books, and serials in print and electronic formats, in addition to less robust access to digital collections be they open access or archival materials. In other words, a fulfillment UX points to locally held or accessible content. Several commercial web scale platforms--ProQuest Summon & Ex Libris Primo, EBSCO EDS, and OCLC WorldCat--provide a unified interface for most or all of these resources types. The principal discovery layer for some libraries consists of a mix of open source or locally developed discovery tools--Blacklight or VUFind--and a commercial article discovery database.

The UX for fulfillment components, i.e., delivery, supports two types of resolution. First, to an available item be it an online resource accessed via a click through path or a physical holding record with location information. Second, requests options for physical resources, including in some cases, document delivery display. Typically, only items owned or licensed by the library are discoverable in the principal discovery platform and fulfillment options are presented only for

items discoverable there. The fulfillment options presented depend upon policies for that individual's patron category and display only after authentication.

ILL and document delivery for items not locally owned or licensed are not incorporated into the principal discovery platform.

The patron's library account information--loans, requests, fines, lists, and preferences--is easily accessed from the principal discovery layer but this account information is limited to locally owned materials only.

Libraries also subscribe to resource databases of varying levels of breadth and specialization, but we will not include these in our discussion. Rather, we are concentrating on the principal discovery layer.

Extensions to the library's principal discovery platform

Our objective is to provide a single interface to answer the question: "Can I get this item through my library?". (See [Appendix A](#) for Core Behaviors) Currently, our principal discovery platforms answer this question affirmatively for items discoverable there and present locally available items for access or loan. However, when an item is not discoverable in the platform because it is not owned or licensed by the library, the existing platform does not present a fulfillment option even though the library can obtain the item through ILL or document delivery. And, typically, the platform does not present an ILL or document delivery workflow in cases where an item is owned or licensed but is not presently available.

We propose extending the functionality of the principal discovery platform to support these two additional use cases:

1. A known item is not discoverable in the platform but can be obtained by the library.
2. An item is discoverable but although not presently available, could be obtained by the library in a sufficiently timely manner to meet the patron's need.

To be sure, libraries currently support these use cases, but that support is via two or more distinct systems with different patron interfaces. Our proposal is to bring UX support of these uses cases and workflows together in one system and to present them within the library's principal discovery platform.

Note that we are not proposing that we expand what can be discovered in the principal discovery platform. We do not believe that there is any advantage to doing that given what we know about patron discovery behaviors. Very often discovery happens outside of library systems. Patrons turn to libraries for fulfillment.

High level requirements

The requirements outlined below are described abstractly, without a detailed specification of particular behaviors. We can imagine a number of ways of implementing this functionality, but we look to platform owners to determine which approaches will provide the best patron experience within the context of their platform.

Discovery inputs to the discovery platform

1. A search entered by a patron into the discovery platform search box or advanced search. (Vendor discretion: the types of searches supported, e.g. author, title, subject; the search scopes, e.g. books, articles; the search facets; the fields supported in an advanced search; support for boolean logic, left anchored searches, authority-based searches, etc.)
2. OpenURL, DOI, and other resolvable resource references, e.g. standards and report numbers. An embedded resource resolver accepts HTTP GET requests as forwarded from other contexts, e.g. GetIT links in databases, Google Books, or WorldCat.
3. A citation entry box/upload point. The patron provides a citation in a standard format as text. The citation handler parses the citation into its components, e.g. authors, title, publication, date, etc. and prompts the user to verify and edit the components. An openURL is created from the edited components and routed to the resolver. (Vendor discretion: which and how many citation formats are supported; whether a set of citations can be submitted at one time; whether exported citations from citation tools in their native format, e.g. Zotero, can be submitted.)

Fulfillment options presented by the discovery platform

With these inputs as starting points, the patron uses the discovery platform to resolve to the known item. In some cases--openURL, citation--the discovery platform could resolve directly to the resource and present access options. In other cases, the patron would browse search results, refine her search, and so on before finding the known item she seeks. Finally, some of the time the known item will not be found through the discovery platform. Discovery will fail to resolve when the known item is not held by the library. And discovery can fail because the patron's input or search execution is poor.

Access options for resolved searches

1. The discovery platform displays holdings information including: call number, location, availability, and terms of use to the patron when the item can be directly accessed by the patron. Examples of terms of use: a reserve item might be available for a two hour loan or a reference item might be available for use only in the library.
2. The discovery platform provides a means of requesting that the item be paged and delivered. The item may be delivered to a pick up location or to an address either

selected or specified by the patron depending on local practices. This option includes an estimate of delivery arrival and costs if any. When there are significant differences in delivery time and cost depending on from which library, ILL partner, vendor in the case of a purchase, etcetera this option will present multiple times. See the fuller discussion on request options below.

3. The discovery platform provides a mechanism to request copy of a portion of the item and the copy is delivered to the patron via a means of the patron's choosing. As with other options, estimated delivery times and costs are provided.

Some means of ranking preferences among options, ruling out unacceptable options, or restricting the number of options a patron can select are variations on how access options for resolved searches could be presented.

However these options are presented, the fulfillment service's options handler must prevent the duplication of requests. A patron's selection of one or more options to "cover her bases" should not result in both a local paging order and an ILL request in the same transaction, for example. Ideally, a fulfillment service would detect functionally duplicative requests across transactions.

Options for unresolved searches

4. The discovery platform provides a means of forwarding the search into another external discovery tool, e.g. a database or WorldCat. Having discovered the resource in the external tool, the patron submits an ILL or document delivery request through the discovery platform.
5. The discovery platform provides a means to request that a librarian locate and determine delivery options based on a citation or identifier. If the request is not interactive via Library chat, for example, the option provides an estimate of response time from the librarian.

These two options should always be available to the patron.

Option for all searches

6. A patron can save her search in her personal resource list so the search can be re-executed later. This type of personal resource list is currently a common tool within library discovery platforms (e.g. Primo's eShelf for new UI Favorites). Ideally, this list should allow patrons to submit their "Get this" requests directly from this list, in the same way that items are ordered through Amazon.

Intelligent options display

Our goal is to shield patrons from the details of how libraries organize and provide their services. The proliferation of options threatens to replicate our organization and practices in merely another guise.

Equivalent options from a patron's point of view should be presented under a single collapsed option. For example, a recall vs. a pull request from remote storage vs. an ILL request are functionally equivalent to a patron. When all options result in roughly the same service--a book is delivered to a pick up location in roughly the same time (for example)--nothing useful is conveyed by presenting three options. A single "request" option should display and the estimated delivery time should indicate the minimum probable delivery time (or the delivery time for the option the routing algorithm, whether automated or a rule a librarian follows, would pick). We would only want to present more than one request option if distinct options present a marked trade off to the patron: option A has fast delivery but includes a fee; option B is slower but free. Keeping in mind, the benefit and costs are potentially more important to the library than to the patron. Option A has fast delivery but costs the library more; option B is slower but cheaper. Presenting the patron with this choice invites her to make a socially conscious decision to benefit her university community. While both scenarios involve a trade off from the patron's point of view, there is a meaningful choice between significant differences.

Structuring/nudging patron decisions

The options listed above imply varying levels of service and expense to both the library and the patron. Libraries, seeking to control their costs or to promote specific services, may prefer that some options be selected rather than others most of the time.

The library should be able to order the presentation of options with the aim of nudging the patron to choose the preferred options. The options should be presented in such a way that that the patron can make an informed decision both about factors that affect them, such as estimated delivery and cost to them, and about factors that affect the library, such as library processing and shipping costs. This engages patrons in a community of stewardship for library resources.

Supporting library service decisions

For requests that the library will fulfill through ILL or purchase, the time to delivery and the cost may fall outside of acceptable parameters to either the patron or to the library or to both. When possible, alternatives should be presented.

To support decision making by librarians, when the patron selects an access option that will invoke external services beyond the control the library, the discovery platform will prompt the patron to declare a need-by date (next week, in two weeks, this month) and an urgency metric (critical, might be interesting, central to my dissertation). These inputs can help the fulfillment librarian decide which source to use for the material, or to notify the patron early in the process if the resource cannot be obtained in time to meet the patron's delivery or cost requirements.

Patron service classes

Libraries often provide different levels of service based on patron type. For example, office delivery is often available exclusively to faculty members. Undergraduates may pay a processing fee for some options that other patrons do not pay. The discovery platform should selectively present only the options available to patrons, based upon their status. Moreover, these options should be structured in such a way as to guide the patron to the preferred delivery mechanism. In other words, the one that best meets both their needs and the library's too. If multiple options exist, these should be clearly communicated and ordered in terms of preference. The options should communicate what service the option will provide the patron thereby allowing them to make informed decisions and choices.

Communications and My Account

Patrons want a single place, My Account, to centrally manage all of their requests, loans and delivered documents in addition to citations they have not acted upon yet. This need was observed during recent usability testing at the University of Minnesota ([Appendix C](#)). The discovery layer, scoped as a holistic patron interface, is the logical place for this though the display of requests managed by external systems will require integration development. Requests, regardless of type, format or status, should display on a single dashboard with item specific details such as request status, due dates, hypertext links to electronic documents, transit information both local or delivery from other libraries. Historical data should display too. The patron interface should display potential format and status specific options to promote effective request management.

Management includes communication, so the My Account should contain copies of communications sent from the library to the patron and from the the patron to the library. Individual request statuses and changes to statuses should display to the patron so they can make informed decisions concerning how they would prefer their requests be processed.

Integration between the discovery platforms and backend systems

The discovery layer populates the request form with metadata and the patron's delivery preferences. Locally configured business logic performs request routing, sending the request to the locally-defined preferred fulfillment source. A matrix of patron status, item information, both metadata and availability, coupled with local policy definitions for provisioning materials provides the logic for automated request submission into the preferred fulfillment workflow. Requests requiring mediation are sequestered for staff review. These requests, defined as edge in the classification of cases outlines in [Appendix B](#), fall outside the scope of the automated request process outlined in this document.

Next Generation Resource Delivery Management System--Functional Requirements

We envision a next generation Resource Delivery Management System (RDMS) that

- integrates with the discovery layer to provide delivery options to patrons presented there and to accept the patron's delivery selections to initiate delivery workflows;
- automates delivery workflows to select the optimal routing of requests to fulfillment partners based on patron needs and library preferences;
- integrates with and works alongside the library's Library Services Platform (LSP) to obtain patron information or to pass request and loan data to the LSP to manage circulation;
- integrates with fulfillment network management systems such as Relais, Rapid, or OCLC Worldshare ILL to identify fulfillment partners and to manage request transmissions;
- manages request and item delivery tracking, and billing of local patrons and other libraries; and
- generates and manages communications with patrons about request status and availability related messaging.

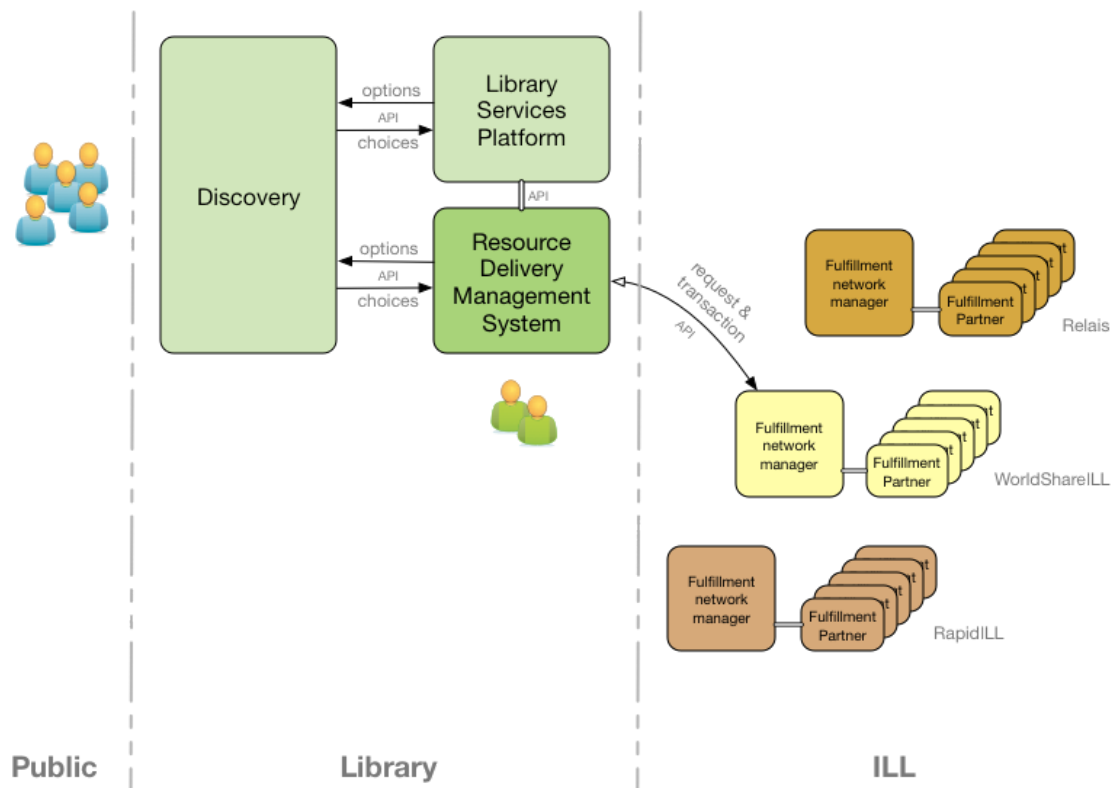
The goal is smart fulfillment. Smart fulfillment brings together policy-driven structuring of choices for the patron, policy-driven and automated routing of requests to fulfillment networks, and ultimately reduced mediation by librarians for routine ILL transactions.

[Figure 1](#) shows the relationship between the RDMS and existing components of the library ecosystem, including the library's principal discovery tool, LSP, and what we are calling here fulfillment network management systems.

A fulfillment network for our purposes is a set of libraries, generally coordinating through a shared resource sharing system, that will loan resources to partners through ILL or will scan locally held print materials. A fulfillment network management system (FNMS) is able to determine whether a network member library holds an item, whether the item is available for loan or scanning to answer a fulfillment query--Can a member of this network fill this request for this item? And the FNMS accepts and routes fulfillment requests to member libraries. From the RDMS's point of view, a FNMS is a black box. Resource-type deflection rules associated with a member library, for example, would be applied by the FNMS when determining whether it could fulfill a request; the RDMS sees only the result of this determination.

Figure 1

Next Generation Discovery to Delivery



RDMS APIs and protocols

The RDMS communicates with other components of the Library system ecosystem through APIs and protocols at three principal points of integration (corresponding roughly to the links that link the RDMS to other systems in the diagram above):

- Options/Choices API integration with Discovery
- Patrons/Circulation API/NCIP integration with the LSP
- Fulfillment query/request/ILL transactions API integration with fulfillment network managers

Suitable APIs and protocols may exist to support some of these integrations, e.g. ISO 18626 and NCIP. In other cases, e.g. options/choices, an API or protocol standard does not exist and would need development and standardized implementation.

RDMS Staff User Experience

The RDMS has a library staff facing user interface in which librarians perform:

- integrated searching of external bibliographic databases;
- integrated searching of external systems' member and policies directories;
- request/routing queue monitoring;
- routing mediation for when automated routing fails to resolve to or select a fulfillment target;
- patron record management ;
- delivery queue management and tracking;
- communications queue management;
- billing of patrons and other libraries;
- copyright management;
- data analytics and management reporting;
- administrative configuration.

Above we define essential, expected, and required staff workflows. Other integrations beyond library specific systems will also be needed, including for example: integrations with local institutional authorization and authentication mechanisms; with institutionally mandated credit card/debit card payment systems; and with shipment tracking systems for UPS, FedEx, etc., all based on industry standards. Increased and nuanced support for the range of item identifiers, local lending workflows, consortial or ex-consortial tiering with load balancing strategies must also exist.

Moreover, appropriate routing and request completion mechanisms need development as part of the smart unmediated routing of requests. In this area, we specifically call out to the ILS and LSP platforms to provide tools for request submission to acquisitions, financial system integrations and patron hold requests. In other words, a mechanisms supporting seamless purchase to placement on the hold shelf workflows should be developed.

Mediation of the request to fulfillment, in whatever form that may take--automated or staff mediated--should resolve to a single place where patrons can see all of their requests. How this occurs is internal to the systems but paramount is their interoperability and ability to communicate between themselves without staff intervention.

Vision

To achieve the goals outlined above, we envision a web-based ISO 18626 compliant resource delivery management system that is built upon newly developed standard protocols. Success for that system is defined as one that effectively supports our patron's needs and expectations for quick and efficient delivery of resources. Vendors, suppliers and library staff must cooperate to create such a replacement to our outdated, siloed systems which are based upon outdated protocols and backoffice products unable to transfer request across systems given their disparate individual capabilities. A supplier-neutral, vendor-neutral system based upon current and emerging technologies must be created from a new foundation that leverages these contemporary tools to effectively meet patrons' needs as they, the customers and consumers, define them rather than delivery based upon what an existing library systems can do. Part of this will also involve developing a resource sharing standard protocol that allows local institutions to profile delivery options so that they can expose and integrate the standard into disparate discovery systems. This resource sharing standard protocol should be submitted to NISO for development as an industry standard.

General Requirements

The resource delivery management system manages the identification of potential suppliers, request submission, item tracking, delivery and billing of both local patrons and other libraries. It avoids duplication of data or information stored in other systems. Rather, data is pulled from external systems via APIs or other protocols as needed. A robust open architecture allowing for the extraction of data for external manipulation/processing coupled with the ability to write back into the system is the system's foundation. In other words, full Create, Read, Update, and Delete function support via RESTful APIs will provide the system with tools to support both internal and external communication.

These requirements include:

- **Request Initiation Mechanism:** The discovery layer provides a mechanism to create a request by the combination of item metadata and patron identification information. Upon submission, locally defined rules are applied and the request is routed per library preferences.
- **Patron Provisioning:** Patrons are identified by a locally defined library identifier which provides a hook to call external systems which then provide additional information about that individual at point of need. Proxy patrons are supported.
- **Request Data:** The system integrates with local systems both staff (Integrated Library System or Library Services Platform) and discovery layers to perform:
 - automated item searching,
 - request submission and
 - local item record creation based upon locally defined policies.

- **Circulation:** As borrowing loans are ultimately circulations, the system uses protocols such as NCIP for the placement of requests and those requests are managed as holds in the local LSP which also performs all patron-facing communications and circulation functions. NCIP functionality works for lending transactions as well; placing holds in the local system for incoming requests, when currently available, and desired by a lending institution.

Staff Interface

The staff interface is customizable in terms of display layout for field placement, field exclusion or custom inclusion with granular user permissions granting access to only needed information, color coding by module with displays for the full life story of a request, copies of all communications to and from the patron and all potential or discarded lenders, and any notes added by the system, staff or patron. Thus a system for recording communications or reactions is required.

The staff tool manages and processes:

- patron requests for locally owned materials,
- borrowing requests to other libraries,
- purchase and selection of materials from commercial suppliers or as part of a local purchase-on-demand program
- requests from other libraries.

Library Specific Customizations:

- **Tiers and Load Leveling:** Tiering of branches, consortia, and regional locations should minimize shipping costs and/or turnaround time, while load leveling within those groups distributes the burden of shipping and labor costs equitably. Both tiering and load leveling should be customizable to each group's needs.
- **Lending Workflow:** Multiple loan periods are supported and applied automatically based upon borrowing library status or item format. The system will only place requests for items on-shelf in loanable collections at both local collections and at partner libraries. Thus pull slip are printed with call number and location on them at the lending library's preferred location be that a central location or a branch, and the slips are easily customizable through a WYSIWYG type editing tool to allow for special integrations such as local barcode numbers or special delivery locations.
- The system also integrates communication to a Remote Storage Management Systems, both stand alone and shared, for retrieval.

Use of Standard Identifiers

- **Identifiers:** Borrowing loan and article requests placed by patrons that lack standardized numbers will be searched in the background to find close matches, reducing staff mediation. Requests that are placed with standard numbers, such as ISBN, ISSN, OCLC, DOI, and PubMed ID, will match without mediation, regardless of the format of the item, eliminating the need to locate alternative OCLC records for books vs e-books,

articles vs serials only available online, and the like. The fulfillment network (OCLC, Relais, Rapid, LSP) system will know which libraries accept requests for each material type and will deflect automatically based on their criteria.

- **Barcodes:** The lending library's item barcode or barcodes must be stored and searchable within the system because this provides a unique identifier for every unique item sent so individual pieces can be tracked as easily as the entire transactions or group they make up.

Flexibility & Customization

Support of local policies, practices and processes with robust customization options including system routing of requests. The local workflows and local tools, not the platform into which a request is placed or processed, drive the processing. Thus, it is supplier neutral and vendor neutral. This allows the library to define how requests are processed rather than the system into which those request are submitted dictating local workflows.

Customized internal widgets for searching the local discovery tool, other discovery tools and commercial providers are included. These widgets can write into the system. Locally defined and developed customized batch processing of requests is supported within the system as part of the open platform. Users- both patrons and staff- can create customized apps for the platform, share these, and other customers can use them too. Interoperability and communication between the resource delivery management system and external request management platforms (Rapid, Docline, WorldShareILL, Relais, shared catalog consortial borrowing systems, CCC Get it now, British Library, etc.) is required as is automated/unmediated smart routing between these systems managed by the resource delivery management system.

Service Integrations

- **Shipping & Handling:** Integrated UPS/FedEX/DHL/USPS tracking at the individual request level displays this information dynamically to both staff and patrons.
- **Copyright Management:** The system will manage copyright compliance for requests that fall within the CONTU guidelines in a flexible way that allows libraries to configure the number of years and number of titles requested per year for copyright. Ability to mark items as "Copyright Already Paid" manually and according to document supplier. It will also integrate with the Copyright Clearance Center to track base fee and submission of copyright payments.
- **Electronic Delivery:** The system includes an electronic delivery mechanism and document management including automated batch processing for staff with direct linking to items in the patron dashboard, as well as document editing capabilities.

- **Document or Item Purchase:** The system will provide seamless access for searching and purchasing from vendors and publishers for the purchase of materials.
- **Payment & Billing:** An integrated automated payment system complements an automated billing system for both patrons and borrowing libraries. Integration with campus or library credit card transaction management systems is included.
- **Communications:** Customizable emails and text message notifications provide mechanisms for staff to communicate with patrons, to other staff in the library or to submit requests to potential stand alone lenders who do not use an integrated system. Likewise copies of emails or text notifications are stored in the system, both to and from patrons. Staff questions to patrons can be answered by patrons updating their requests (years needed, preferred format, etc) within the system instead of via external email chains.

Reporting & Analysis

The system needs a robust reporting and analysis component. Standardised reports will provide access to generally required and standard metrics such as those required by ARL, AAHSL and state library systems but the system must also support on the fly searchability for ad hoc queries by standard external tools such as MS Access, Tableau or other data and data visualization tools. Data must be easy to export for manipulation in external tools. Reports should also include system-wide data to allow comparison with other libraries and members of consortia.

Test Environment

The system must include a robust sandbox environment where all aspects of the system and its interactions with other systems can be tested. This environment includes both test web pages and a test server duplicate of production so staff can experiment with new workflows, customizations, user authentication methods, inter-system integrations and locally developed widgets without having to run these against a production environment.

Conclusion

Over the preceding pages, we have described a patron interface where smart delivery options powered by intelligent, rule-based request routing to the appropriate fulfillment system integrates request management into the discovery layer. Thus patrons have a simple to follow, understandable path to resource delivery with appropriate and timely communication. They have a single place to manage all their library transactions. Libraries gain the ability to

nudge patrons toward preferred local delivery practices provided through unmediated and coordinated system to system communication.

Rule-based request routing and systems-level integration through APIs are types of automation that could potentially reduce fulfillment staff costs for typical requests. In the long run, these savings could offset the costs of implementing the features we have described, whether reflected ultimately in product licensing costs or in local IT support for customizations and integrations. However, an analysis of costs and benefits and how these are distributed is beyond the scope of this document. And arguably, implementation costs cannot be known until vendors and libraries are engaged in implementation planning.

Appendix A

Core Behaviours

What the patron needs to do	What the UX presents	Where the resource exists	What a librarian needs to do
Obtain a known item: book	A request button	Available on shelf	1. Pull and deliver item on the shelf 2. If not found on shelf, route request to ILL system with ISBN
Obtain a known item: journal article (print)	Location A request for the volume (if the volume circulates) A request for a scanned copy	Available on shelf	3. Scan and deliver item on the shelf 4. If not found on shelf, route request to ILL system with ISSN
Obtain a known item: journal article (electronic)	A request button	Available in local subscription	5. Resolve to URL, and deliver item 6. If holdings are wrong, route request to ILL system with ISSN

Obtain a known item when no local copy is available: book	A request button	At a consortial partner library	1. Unmediated request is sent via web service 2. Mediated if unfilled.
Obtain a known item when no local copy is available: book chapter	A request button	At a consortial partner library	3. Unmediated request is sent via web service 4. Mediated if unfilled.
Obtain a known item when no local copy is available: journal article	A request button	At a consortial partner library	5. Unmediated request is sent via web service 6. Mediated if unfilled.
Obtain a dissertation completed at another university	A request button	At another library	Search for full text, and if not found, send request to granting institution via OCLC.
Obtain a book chapter	A request button	Available on shelf	Scan and deliver pdf
Obtain a book chapter	A request button	Checked out, but on shelf at consortial library	Unmediated request is sent via web service.
Obtain 1987-88 of a newspaper: microfilm	A request button	These years are missing from the library's collection; CRL has it	Mediated request is sent to CRL via OCLC.

Appendix B

Classification of cases

The tools described above and their development should address the most common and most commonly requested types of materials and ease the resolution from discovery to delivery. These central items- books, journal articles, DVDs, CDs and scores- have a number of unique

identifiers- ISBN, PMIDs, DOIs, OCLC numbers, etc.- that can and should be more effectively leveraged. Development efforts should focus on these discrete individual works rather than on portions of works, e.g. a journal issue, or items that are unique, e.g. a master's thesis. Stated differently, development should concentrate on common mass-produced items not on the edges or the "long tail". As common items constitute the bulk of materials identified and requested, efforts must concentrate on these.

{Here we classify cases roughly by whether they are frequently encountered "central" to the activities we want to support or should be counted as edge cases--rarely occurring, possibly difficult to support.}

Central

(Items have identifiers, e.g. ISBN, ISSN, OCLC number, or can be reasonably resolved, e.g title, author, date of publication; items are treated as a single piece; items a mass produced.)

Single printing single volume monographs

Journal articles with DOI and/or ISSN

DVDs

CDs

Scores

Edge

(Unique items or not-contemporary formats) Require human intervention

US Dissertations in print only

Electronic Dissertations (depending on an Institution's Proquest subscription)

Foreign Dissertations

Master's Thesis

Archival materials

LP records

16mm films, or 8mm

Print Newspapers

Microform series

Data sets

Principal pain points

Consistently resolving effectively to locally available holdings of e-resources

Requesting a portion of a title

Competing service options

Grey literature

Born digital

Unique one copy items

Delivery time and loan periods at variance from local materials practice

Appendix C

University of Minnesota's Usability Testing

In April of 2017, Minnesota conducted usability testing with three volunteer students. Each student was given a set of tasks to complete; requesting an unavailable book, requesting a chapter of a book, obtaining an article that the U of M does not have access to electronically (but the print journal is held), ordering a DVD, navigating to ILLiad and accessing an article in ILLiad.

Users who had never used the Interlibrary Loan service struggled with all of the scenarios to some degree. Based upon the observations, there are strong recommendations to:

- Simplify the disparate systems into one interface; and an interim measure, ensure that there are links to the ILL system from Primo's My Account and vice versa.
- Consider other possible displays and language to assist the user in making a choice when more than one service option is presented; the interface of two or three request buttons in discovery does not provide enough information for the user to determine the quickest method of request.
- Perform additional usability testing sessions. Interlibrary Loan has too many touch points for a single round of usability testing to provide enough feedback.

Observations and Suggestions

Observed Issue	Recommendation
The label "Interlibrary Loan" does not encompass the concept of digitizing copies via "Document Delivery"	Suggest finding a more inclusive service name
The Primo application and Interlibrary Loan application do not seem like separate programs to the user	Consider adding, to the username login dropdown, links to the individual systems for "Catalog", "Interlibrary Loan", etc
Could not come up with a way to find movies, expected something on the home page or in the catalog to continue down a path	Consider adding more prominent messaging in Primo potentially specifically addressing movie requests
Expected the ILL requests to be in Primo My Account	Consider adding Interlibrary Loan menu link in Primo My Account, or a link on the Primo My Account Requests tab
"Get a Chapter" may imply the user can get immediate access to it	Consider less immediate sounding language such as "Request a Chapter"

Participant felt obligated to fill in fields that weren't filled in via the OpenURL, or as much of the optional fields (e.g. chapter specific information)	Make the required fields more obvious
On article form, participant put article title in the first field, which was for journal title, then had to move to the correct field	Consider putting the article fields before journal fields on article form
Participant selected Get a Chapter but did not enter any chapter specific information in the form	Add a check to the form for whether a chapter field has data and prompt user if they meant to get the whole book
Participant (backup test) chose Get It as the quickest method to receive the book where, based on the record, it likely isn't; it is not possible to assess, based on the interface, what option is the quickest	The interface of two or three buttons does not provide enough information for the user to determine the quickest method of request, need to consider other possible displays to assist the user to the best requesting method

Task Completion

S#	Description	P1	P2	P3	Completion %
1	Unavailable Book Request	Y	Y	Y	100%
2	Internal Available Chapter Request	N	Y	Y	67%
3	Catalog Print-only Article	N	Y	Y	67%
4	Blank Form Other Request	N	Y	Y	67%
5	Navigate to ILLiad	N	Y	N	33%
6	Access Online Article in ILLiad	N	Y	Y	67%
	TOTAL	16.7%	100%	83.3%	67%

User-Perceived Difficulty (Single Ease Question)

Overall, how difficult did you find this task? (please circle your answer)

Very Easy

Very Difficult

1

2

3

4

5

6

7

S#	Description	P1	P2	P3	Total	Mean	Ease Rank
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1	Unavailable Book Request	2	2	2	6	2	1st (tied)
2	Internal Available Chapter Request	5	3	2	10	3.33	3rd
3	Catalog Print-only Article	6	5	4	15	5	5th
4	Blank Form Other Request	7	4	3	14	4.67	4th
5	Navigate to ILLiad	6	1	2	9	3	2nd
6	Access Online Article in ILLiad	4	1	1	6	2	1st (tied)
	TOTAL	30	16	14	70	3.33	