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Selection Strategies for Strategic Library Technologies

IT IS ESSENTIAL FOR LIBRARIES NOT TO EVALUATE THEIR NEXT SYSTEM SOLELY THROUGH THE LENS OF THEIR CURRENT SYSTEM. INSTEAD, SELECT ONE THAT'S ALIGNED WITH CURRENT AND ANTICIPATED REQUIREMENTS.

Libraries depend on their automation systems for almost all aspects of the work that they perform—including the automation of routine operational tasks—for managing their collections and for providing access to their patrons. Collection management includes activities related to the acquisition and description of content items, as well as the provision of their access to library patrons. The composition of library collections has evolved over the years, with electronic content and digital objects representing increasing proportions relative to print materials and other physical items. Access to these collections involves an increasingly complex set of tools for discovering items of interest among collections of growing size and complexity and providing appropriate mechanisms for access or delivery. Likewise, the automation systems used by libraries have evolved, with many different categories of products now available.

CLARIFYING THE CATEGORIES

It might be helpful to take a step back and review the main categories of library-technology products used today. The broadest level divides those intended for use by a library's end users from those used by library personnel. Patron-oriented products include discovery interfaces, index-based discovery services, and library portal platforms.

Strategic Patron-Oriented Technology

Discovery interfaces manage the presentation of library materials to patrons, and they're almost always accessed through a web browser. These discovery interfaces are typically designed to be used independently of any specific resource management system and provide features that facilitate the search and access of materials. These features include a search box for entering queries, the ability to return results in response to queries, facets based on search results to help narrow results into manageable sets, and the capability to order results according to relevancy, date published, or other meaningful factors. Discovery interfaces operate in conjunction with one or more resource management products, which provide the content ultimately presented to the user.

A discovery interface may maintain its own local index to facilitate the discovery of collection materials. A common arrangement involves harvesting and synchronizing records from a library's ILS and indexing those records using Apache's Solr or another search and retrieval component in order to provide rapid retrieval of search results and calculation of relevancy. The local index of a discovery service may be populated by multiple sources in addition to the ILS (such as digital collections, institutional repositories, or other content systems that the library has access to). Some

examples of discovery interfaces are as follows:

- VuFind, an open source product originally developed at Villanova University and now used by thousands of libraries globally
- Blacklight, an open source product originally developed at the University of Virginia
- Encore Discovery System, a proprietary discovery interface developed by Innovative
- SirsiDynix Enterprise, a proprietary discovery interface developed by SirsiDynix
- BiblioCore, a proprietary discovery interface developed by BiblioCommons, which operates with any major ILS product that offers a variety of social networking and engagement features oriented to public libraries

While these discovery indexes may maintain an index that represents many aspects of the library's collection, they do not aim to represent the totality of library-oriented content. Discovery interfaces also interact with ILSs to provide statuses and services associated with the physical items of a library's collection. Replacing the functionality of the traditional online catalog, these discovery services display the current availability of any given print item and offer standard services (such as the ability to place a hold, perform renewals of previously charged materials, or view lists or details from the patron's profile).

Index-based discovery services include a discovery interface component, as described previously, but they also provide a massive index that addresses the broad scope of the scholarly literature at a very granular level. The indexes associated with these products describe the individual articles, book chapters, and other items from the major publishers and other providers that offer content products to libraries. These materials may be represented through citation-level metadata, the full text of the item, through value-added abstracts, descriptors assigned from controlled vocabularies or subject-specific thesauruses, or other terms that may enhance retrieval.

The indexes associated with these discovery services might include hundreds of millions or billions of entries representing content items. An index-based discovery service will also address the local content items as those associated with discovery indexes, as described previously. Some examples of index-based discovery services are:

- ProQuest's Summon Service
- Ex Libris Group's Primo and Primo Central
- EBSCO Information Services' EBSCO Discovery Service
- OCLC's WorldCat Discovery

Library portal platforms provide functionality beyond the discovery and access of library materials; they also include functionality and content that replaces the entire library website. These products include a discovery interface, a local discovery index, and a content management environment controlled by an administrative console, which allows a library to deploy its entire website with all of the standard content and features. Some examples of these library portal products are:

- BiblioCMS developed by BiblioCommons
- SirsiDynix Enterprise from SirsiDynix
- Axiell Arena from Axiell (used primarily in Europe)
- Iguana from Infor (used primarily in Europe)

Strategic Technology Products Oriented to Library Personnel

The key technology products used by library workers fall into a broad category of resource management systems. This category includes ILSs, library services platforms, and more specialized products.

ILSs have been the mainstay of library automation for several decades. These products were originally designed to provide comprehensive support to libraries regarding print and other physical materials. They've since expanded to support ebooks and other electronic materials. ILSs provide centralized databases for bibliographic description, holdings, financial information, and other types of operational data. Typical modules of an ILS include cataloging, acquisitions, circulation, serials management, and an online catalog. The ILS remains well-suited for organizations—especially public libraries—whose collections are comprised primarily of print and electronic books. Some of the major ILSs available to libraries in the U.S. are:

- SirsiDynix Symphony from SirsiDynix
- SirsiDynix Horizon from SirsiDynix
- Polaris ILS from Innovative
- Apollo from Biblionix
- CARL•X and Library•Solution from The Library Corporation
- VERSO from Auto-Graphics
- Destiny from Follett School Solutions
- Atriuum from Book Systems
- LibLime Koha, an open source ILS, with multiple support providers
- Evergreen, an open source ILS primarily supported by Equinox

This strategic technology product has the longest history and broadest level of adoption, and this list contains some of the familiar names.

Library service platforms are a new genre of resource management system that emerged with a functional design

and technical architecture substantially different than the established ILSs. These platforms were designed to manage a broad variety of library resources, especially addressing the extensive quantity of electronic resources held by academic and research libraries in addition to print holdings.

THE PROCUREMENT PROCESS SHOULD LAY OUT THE GENERAL GOALS THAT THE LIBRARY EXPECTS ITS NEXT AUTOMATION SYSTEM TO MEET.

The products were developed to follow the services-oriented architecture, are deployed through global multitenant technology platforms, and deliver functionality to library personnel via web-based interfaces without the need for locally installed desktop software. Library services platforms also include shared knowledgebases that facilitate the management of a library's print and electronic resources. The major library services platforms available include:

- Ex Libris Alma from Ex Libris Group
- WorldShare Management Services from OCLC
- Kuali OLE, an open source library services platform
- Sierra from Innovative
- ProQuest Intota from ProQuest

It should be noted that the library services platforms available vary considerably in technical architecture and functional organization. Not all of the characteristics of the library services platform are exhibited in all of the products, but these products all make a significant departure from the traditional ILS. It should also be understood that the designation of a product as an ILS rather than a library services platform isn't a negative judgment. These two categories have different characteristics that appeal to different library automation scenarios.

There are also some products with hybrid characteristics. For example, SirsiDynix's BLUEcloud Suite provides a new platform consistent with the characteristics of a library services platform, but with dependencies on the Symphony and Horizon ILSs. While it is beneficial to have categories that help differentiate among the strategic technology products available today, these categories are not absolute and many products fall into gray areas.

STRATEGIES FOR SELECTION

Libraries tend to keep their strategic resource management systems for more than a decade. Inevitably, the strategies and the operational priorities of the library have changed in many ways during the period in which that product was employed. It is essential for libraries not to evaluate their next system solely through the lens of their current system. Instead, they must select one that's aligned with current and anticipated requirements. As libraries consider the replacement of their current system, there are some broad strategies to keep in mind. This will help identify the product that might provide the best supporting technical infrastructure in a time when libraries face ongoing change in many aspects of their collections and service expectations.

Conceptual Design Versus Individual Features

A procurement process should give equal value to the vision of what a proposed system aims to accomplish as it does the prescriptive details describing current operational practices. New-generation systems may follow a significantly different framework or paradigm of library automation compared to those designed decades ago. For example, carrying over the detailed management requirements of print resources may not provide a strong foundation for automating libraries that now deal heavily with electronic and digital resources. Although the management of print resources may represent a remnant of the library collections, for most academic libraries, the current collections are skewed toward electronic materials, with even higher proportions expected. Selecting a system based on its capabilities for traditional print resource management could represent a very conservative position that would constrain the library.

Identify the Vision Driving Individual Features

A procurement process that offers a framework of the library's general strategy and expectations from its next resource management and discovery services may provide a more effective basis for selection than a prospectus and detailed request for proposals. A strategic resource management system is more than an aggregation of features. It should also follow a set of design principles that result in a coherent environment.

It is important that any procurement process enables the provider of the system to articulate the general vision of its product in addition to the specific features offered. How the high-level design of the product aligns with the library's broad expectations for its automation system should be evaluated as carefully as detailed functionality.

Providing detailed checklists of functionality—which is typical of many requests for proposals—can be counterproductive in identifying a forward-looking resource management platform. This approach can be especially detrimental if the checklists are dominated by current functionality or workflows. A more progressive approach may be a process that states the priorities and expectation of the library in more general terms and allows responses that articulate the vision of the system provider in providing functionality that addresses those needs.

Checklists of functionality may not be entirely effective at identifying the systems that best meet the strategic interests of the library—especially since vendors might be able to respond

positively to almost any item even when the capability may be technically compliant, but not wholly consistent with the broader intent.

The procurement process should lay out the general goals that the library expects its next automation system to meet. It is essential to be open to responses describing features and workflows that may be divergent from libraries' current systems and traditional features. Requiring next-generation systems to fulfill current and past generation requirements may result in a conservative selection that will hinder the library as it faces each new wave of change imposed by society, technology, and the publishing industry.

There may be some areas in which the library has mandatory requirements needed to sustain its operations. However, libraries should be wary in compiling extensive statements of expected functionality based on their current workflows and procedures. Many of these requirements may have been essential in previous years. And yet, they are not necessarily as relevant for a system today, which will be used for the next decade or longer. Also, by proscribing how a given feature must be provided, the library may close itself off to new ways of approaching tasks that might enable new efficiencies in the context of alternative workflow models. The procurement process should entertain responses that propose significantly different methods for accomplishing tasks relative to the well-established methods.

One of the greatest challenges in selecting a new system lies in identifying the ones that can meet current needs and adapt to changing demands. Libraries are facing inevitable change, where even the fundamental bibliographic standards (such as MARC) seem positioned to give way to new structures such as linked data, RDF, and BIBFRAME. Products that lock libraries into current practices—and do not enable the new and emerging bibliographic frameworks and new models of resource procurement—could impede their ability to take advantage of these developments. The selection of a new system must balance the requirements needed to sustain library operations in the present and the short-term future. It must also demonstrate the flexibility and extensibility to adapt to the changes anticipated in the not-too-distant next phase of resource management.

Demand Extensibility and Interoperability

It is increasingly important that strategic library products not be provided as a closed system. They should expose a robust set of APIs that allow the library to programmatically access its functionality and all aspects of the data it manages. Libraries rarely operate in an isolated environment. Instead, they participate in a network of related systems.

APIs are essential to enabling a library to dynamically exchange data with external systems, such as the financial systems of its parent institution, learning management platforms, authentication or single sign-on environments, and a variety of other systems. APIs also enable library programmers to develop scripts or software components, creating functionality that extends the capability of the product. Programmers can also use APIs to extract data or produce reports.

THE CURRENT SLATE OF LIBRARY-TECHNOLOGY PRODUCTS INCLUDES BOTH THOSE MADE AVAILABLE THROUGH OPEN SOURCE SOFTWARE LICENSES AND PROPRIETARY PRODUCTS

Libraries increasingly consider APIs an essential feature of a system. Even libraries that do not employ programmers benefit from APIs to enable interoperability with systems that might be set up by an external consultant, a systems integrator, or by the vendor providing the system. Differentiating factors include the areas of data and functionality addressed by APIs, whether they allow the creation or modification of data in addition to read-only transactions, how well they are documented, and any license requirements or access restrictions.

Consider Open Source or Proprietary Alternatives

The current slate of library-technology products includes those made available through open source software licenses and proprietary products. Significant differences may apply to how these two types are acquired, deployed, and supported. Given viable options in either category, it is important that libraries not limit their options in the procurement process. Even if a library does not prefer to take on the full implementation of an open source system by itself, the procurement documents can be shaped to give consideration to firms proposing a system based on open source software, which includes a comprehensive set of support services. For libraries that may have a general preference for open source software, they can likewise be limited through the exclusion of products based on proprietary software.

Consider Vendors as Partners

As libraries make large investments in technology products, it is often beneficial to engage with potential providers of those systems beyond that of the typical customer/vendor relationship. Libraries do not simply purchase and consume these technology products; they expect to have a voice in the direction of future development. Most of the strategic library automation products have sparked the formation of user groups as formal organizations. These represent the interests of the libraries that have invested in them to the organization that produces them. These user groups perform roles such as training or education surrounding the products and may have a role in specifying future enhancements.

At a minimum, libraries should participate in these groups to help shape development. Beyond these groups, the

producers of library-technology products may also provide opportunities for libraries to engage as development partners for new versions of existing products or for future products. I believe that libraries gain important benefits from these opportunities, and they can provide insight into the development process that vendors may not be able to discover in isolation. Most of the new-generation products have emerged from collaborative efforts, joining libraries with commercial or nonprofit organizations.

The selection of a system should give ample consideration to the relative strengths of the organizations offering the products in addition to criteria oriented to cost and features. Business strategies, corporate stability, development capacity, and other organizational factors should be understood and evaluated. Given that these systems are likely to remain in use for a long time, a system with more features today could fall behind relative to its competitors in the absence of an aggressive road map of development. While it is not possible to predict the future, libraries must attempt to discern which organizations are likely to survive in an industry characterized by mergers and acquisitions. Then, they must determine which of those survivors will have the capacity and insight to develop their products in ways that will be responsive to future library requirements.

Evaluate Alternate Deployment Models

Previously, the default deployment model of an automation system required the installation of the software on a server managed by the library or consortium. Many more options are available now. A library can opt to have the vendor take full responsibility for managing the server housed in the library's data center, or the vendor might offer hosting services for the server in its own facilities. Some products are delivered only through SaaS, obviating the need for a library-based server.

While there may be some circumstances in which the library may need to house and manage the server for its major systems, in most cases, the library can free up its technical personnel by opting for deployment models that do not involve local server hosting or administration. One of the major trends in recent years has been the movement toward some kind of vendor-provided hosting. Important considerations for these external hosting arrangements include fulfillment of requirements related to security, privacy of patron details or financial data, as well as fast performance, high thresholds of reliability, and other requirements that would be specified in a service-level agreement.

Seek New Library Partners

Especially for libraries that have previously deployed their own independent ILS, there may be opportunities to expand offerings to their patrons—and to lower cost—by engaging with other libraries in a shared resource management infrastructure. Sharing an automation system with a group of partner libraries can mean significant change relative to workflows and policies established for a stand-alone environment, but can likewise bring benefits. Library patrons gain access to a larger catalog of resources. Some are available more immediately from their local library and others are available by request and delivery from the other libraries participating in the shared system.

As libraries move to shared systems, they usually enjoy lower software costs and may be able to work together in areas such as processing new materials to gain efficiency. Shared technology infrastructure can involve some compromises in policies and procedures. As libraries change systems, a lateral move from one stand-alone product to another may have less of an impact than one that also involves additional resource-sharing capability with partner institutions.

Calculate Value Versus Cost

It is important for libraries to identify the strategic technology platforms that offer the best economic value. Calculating the total cost of ownership during the lifetime of a product involves a variety of factors, including the personnel resources involved. Many scenarios are not simply a replacement of an existing system and include new hosting arrangements, implementation of products with broader scope, and new consortial arrangements. For example, if a library shifts from a system installed on a local server to a hosted configuration, cost savings related to systems administration and data center charges are offset relative to hosting fees.

When libraries adopt a new product that manages electronic and print resources, multiple incumbent systems may be replaced. Given these factors, new products may have higher price tags than an incumbent system, but they may still provide a good value by displacing other costs. Therefore, it is important to perform a budget analysis that includes a fairly broad set of factors beyond the direct cost of the system, as libraries weigh the relative value of competing options.

During the many years I've been following the realm of library automation, it seems as if the numerous strategic technology products available today are more interesting and varied. Previously, the model of automation was fairly consistent among the ILSs. The competition at that time centered mostly on providing the best features and support.

Today, libraries face a more complex set of choices. Differing models of resource management (including ILSs and library services platforms), the variety of discovery products, hosting models, and collaborative implementation models result in a more complex matrix of possibilities. While this matrix yields more difficult processes in the selection of strategic technology products, it also represents opportunities for libraries to make meaningful choices as they seek the technology infrastructure that will provide the best support for their operation and services. ■

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