Use of Library Standards in Dynix Products

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As library systems have evolved from the early 1980's, they have been expected to interface with external systems. These external systems include other library and related systems, as well as hardware and software products, like self circulation and security systems, telephony products, book jobbers, serials subscription agents, collection agency services, conveyor belt check-in systems, the World Wide Web, and the list goes on. In order to communicate with these systems and devices, Dynix products are designed to support and communicate using established library, computing, and network standards.

Bibliographic Record Storage and Exchange

MARC 21 Format for Bibliographic Data - This relatively new format combines US MARC and Canadian MARC formats. All Dynix cataloging products recognize and support MARC as the fundamental building block for the bibliographic database and accommodate MARC import from and export to other MARC databases.

MARC 21 Format for Authority Data - Similarly, Dynix ILS , Horizon and NOTIS systems support the loading, storage, and indexing of MARC Authority records, accommodating See, See Also, and Notes fields.

MARC 21 Format for Holdings Data - This record format was created to standardize the exchange of Holdings information, primarily for Serials Summary Holdings data, and, more recently, for monographic copy information. Dynix ILS and NOTIS have supported the import and export of Serials MARC Holdings formatted records since the early 1990's and Dynix ILS accommodates Publication Pattern Loading, based on the format. Horizon now supports the import and export of MARC Holdings data.

MARC 21 Format for Community Resource Data - Dynix ILS and Horizon both support the import and export of Community Resource Information & Resource files using this MARC format.

UNIMARC - This MARC format is maintained by an IFLA (International Federation of Libraries Associations and Institutions) committee to facilitate the international exchange of bibliographic data in machine-readable form between national bibliographic agencies. Many European countries use this format, and Dynix ILS and Horizon support this MARC standard. Horizon is being enhanced to support features that are unique to UNIMARC.

Dynix monitors Library of Congress and OCLC for both changes made to the MARC standard and schedules to implement these changes, and works to accommodate any changes. Dynix is usually able to incorporate changes to the MARC format into Horizon with the next general release, assuming adequate lead time between publication of standards and the time of the general release. However, many changes to MARC format can be directly applied by the library through editing the MARC tag definitions and the library need not wait for the next release to incorporate required changes.

Bibliographic Record Search and Retrieval

Z39.50 Version 3 - Z39.50 was created to facilitate the searching and retrieval of bibliographic information between disparate library information systems. In 1995, Version 3 was ratified, which introduces many more features. Dynix uses features from Version 3 in many of its products, but relies on international, national, and regional profiles (listed below) to define exactly which of these features to implement.

The Bath Profile - An International Z39.50 Specification for Library Applications and Resource Discovery—The Bath Profile was created to ensure interoperability between disparate systems, by specifying exactly how data elements should be encoded and interpreted. The Bath Profile specifies the use of common communication formats like MARC, XML, and SUTRS (unstructured text syntax) for searching and retrieval of bibliographic, holdings, full text, and Dublin Core information (explained below). Dynix staff participates in Bath Profile meetings and on the Bath Profile email listserv.

U.S. National Z39.50 Profile - As North American implementers began implementing the Bath Profile, there were searches and features they had in common, but which were excluded in the international profile. NISO appointed a group to oversee the creation and testing of profile which satisfies the needs of North American implementers more precisely than the Bath Profile. Dynix provided one of the members of the NISO SC AV committee, charged with developing the National Profile. Dynix Z39.50 servers and Z39.50 clients have been enhanced to comply with the specifications set forth in both the national and international profiles. This software is now available with Horizon Information Portal, for both client and server.

Dublin Core - The Dublin Core metadata set has been devised to accommodate the searching and retrieval of data across disparate markets and data types, i.e. Historical Society, Museum, Library, Image Servers, Web servers, and related systems with unlike data structures. It is intended to be the Esperanto of information retrieval, defining a much

smaller set of data elements than MARC, but in categories wide enough for all systems to recognize. Horizon Digital Library uses Dublin Core metadata to describe its digitized documents and searches this metadata, in addition to the full text data within the documents themselves.

Both the International Bath and U.S. National Z39.50 Profiles support the search and retrieval of information in a Dublin Core format, allowing library systems to query non-bibliographic databases using Dublin Core tags, and demanding the library Z39.50 servers be capable of serving up bibliographic data in Dublin Core tags for non-bibliographic search tools. Horizon Information Portal Z39.50 client and server software has been enhanced to support searching and retrieval of the Dublin Core record format.

Acquisitions Information

BISAC - The Book Industry Standards Advisory Committee created an electronic ordering standard in the 1980's, which was quickly adopted by Dynix ILS and Horizon systems. The BISAC communication standard is still used by many book jobbers and publishers in accepting and processing electronic orders created and sent by Dynix information management systems.

ANSI X12 - In the late 1980's and early 1990's, SISAC (The Serials Industry Standards Advisory Committee) and BISAC resolved to begin using the U.S. National protocol for electronic exchange of business information: ANSI X12. Dynix personnel helped map Order, Invoicing, and Serials Claims information into the X12 protocol. Dynix ILS now sends and receives electronic order, order acknowledgement, invoices, claims and claims responses in X12. Horizon has also implemented X12 for Serials claims. Subsequent to the inauguration of this effort these committees determined to embrace a closely related international protocol, EDIFACT.

EDIFACT - The mapping of EDIFACT (Electronic Data Interchange for Administration, Commerce and Transport) for book and serials information was defined by EDItEUR, an international standards group made up of representatives from the library, publishing, and booksellers industries. As BISAC and SISAC combined to form the Book and Serials Advisory Committee (BASIC), this new committee resolved to use EDItEUR guidelines for implementing EDIFACT. Dynix ILS supports the same transactions in EDIFACT as it does in ANSI X12. Horizon supports EDIFACT electronic ordering, order responses and invoicing. Horizon 7.2 has also been enhanced to allow libraries to specify item-specific information, such as barcode, collection, call number, etc. in the EDIFACT order and receive this information back in the electronic order response, invoice or MARC record (generally imbedded in the 9xx tag), if supported by the book jobber. EDIFACT "quotes" are being designed for a future Horizon and Dynix ILS release in order to import the vendor's pricing into the PO. As book jobbers implement it, this new message will allow the library to use their jobbers' website for ordering titles, and yet populate the library system's acquisitions data with the appropriate price and title details.

Item Identification

International Standard Book Number (ISBN) - The ISBN is a unique bibliographic control number used by library systems (including Dynix ILS, Horizon, and NOTIS) to search, acquire specific titles, and match and overlay specific bibliographic records. All Dynix products support the ISBN.

International Standard Serial Number (ISSN) - The ISSN is a unique bibliographic control number used to identify Serials publications. It is the basis of the SICI (explained below) and is becoming more prominent in the searching and delivery of serial articles. All Dynix products support the ISSN.

Library of Congress Control Number (LCCN) - Each title published in the United States is theoretically processed by the Library of Congress and given a unique LCCN. Many libraries use these numbers (in conjunction with ISBN and ISSN) to ensure title uniqueness as new bibliographic records match and overlay existing bibliographic records in the library system, and for search and retrieval of titles. All Dynix products support the LCCN.

Serials Item and Contribution Identifier (SICI) - In the early 1990s, SISAC created a standard which would allow systems to easily identify serials articles, graphs, pages, etc. for search, retrieval, and claiming purposes. The SICI was devised to identify the Serials title (by means of an ISSN) and article (by enumeration and chronology) and even by page, image, chart, etc.. These data elements make linking to full text databases possible. Dynix ILS and Horizon use the SICI in processing electronic claims, since this is the identifier specified by ANSI X12 and EDIFACT. In addition, barcode readers can be programmed to scan and read the SICI from the SISAC Barcode, where it exists on serial issues, and Dynix ILS is capable of using this scanned SICI to speed up the Serials Checkin process.

OpenURL - The OpenURL standard is primarily intended to aid in finding library-accessible versions of the item described by a bibliographic reference. For example, when users discover an interesting abstract in an "OpenURL-compliant" abstracting database, they could issue a command which displays library-related "Services" for that reference.

When one of these services is selected, the bibliographic information relating to the abstracted article (title, author, journal, volume, page, etc.) would be passed to the library-subscribed full text database, a search would be executed for that journal article, and the patron's browser "wakes up" in the full text database's search results screen - the full text of the article.

To make this possible, the abstract database vendor must formulate an "OpenURL" for each abstract, consisting of (essentially) two parts: the URL of a "Link Resolution Server" or "Resolver" at the patron's library, and bibliographic information (metadata) associated with the abstract. When the patron clicks on the abstracting system's "Services" button, control is passed to the patron's library's Resolver, along with the abstract's metadata (in syntax defined by the "OpenURL Standard"). The Resolver, which has been pre-populated with information regarding which resources are available, assists the user in selecting the most appropriate format or source of information.

In this way, the OpenURL standard facilitates the "delivery" of library-accessible Services associated with a bibliographic reference. For a Service to be "OpenURL-aware", it must be accessible via URL (i.e., information and instructions can be passed via the standard HTTP process of connecting to a server and returning HTML results to a browser). Horizon Information Portal is OpenURL-aware, addressable from a Resolver which would format the Horizon Information Portal search URL with the appropriate metadata and search Horizon Information Portal for the requested materials. A future version of Horizon Information Portal will address Horizon Information Portal as an OpenURL requestor, not just a target.

Circulation Information

3M SIP - 3M created a standard for exchanging circulation data when they introduced the 3M SelfCirc systems. These required that the library systems be programmed to send and receive patron and item status information in a specific format. Dynix ILS, Horizon and NOTIS all accommodate this first version of SIP (Standard Interface Protocol).

3M SIP2 - As 3M enhanced their products, they needed to expand the circulation data being passed between their devices and library systems, and created a specification called SIP2. Horizon and Dynix ILS were the first two library systems to be qualified on this next generation of the Standard Interface Protocol. Furthermore, this protocol has been adopted by other systems and products attempting to communicate with library systems. Horizon Remote Patron Authentication has been programmed to use SIP and SIP2 in order to authenticate against library systems that support these standards and the SIP2 interface is used by a convey-or belt checkin system, as well as other security circulation checkout and checkin systems with Dynix ILS and Horizon.

Z39.83 NISO Circulation Interchange Protocol (NCIP) - As more library systems and related products demonstrated the practical benefits of interoperation to accommodate their individual needs, a standard was proposed and was approved by the National Institute of Standards Organization (NISO) in July 2002. Dynix has been involved in this effort from its inception and is a leader in implementing this new standard. The interlibrary loan products from Dynix use NCIP to communicate with library systems created by Dynix and other vendors. Horizon is scheduled to begin supporting some NCIP services for Horizon Reciprocal Borrowing and Horizon Inter Library Loan in 2003.

Interlibrary Loan

ISO ILL - The second edition of ISO ILL standards (ISO 10160 and ISO 10161) was adopted in 1997, and Dynix has been involved in the development of this ILL standard since before that time. We have participated in the ILL Protocol Implementers Group (IPIG) meetings since their inception and were the first vendor to exchange production ILL requests with another implementer (National Library of Canada) in an IPIG Profile-conformant fashion. Dynix continues to be heavily involved in ISO ILL activity through its IPIG representative.

NCIP Direct Consortial Borrowing (DCB) contains four profiles, one of which standardizes Dynix's URSA interlibrary loan product's existing proprietary links to character-based circulation systems, streamlining ILL and reducing staff time by approximately 75%. NCIP DCB support has been implemented in URSA today, and it will be fully incorporated in Dynix's new ILL products in 2003. This standard also enables libraries to authenticate patrons from other libraries with whom they have reciprocal borrowing agreements and automate the creation of new patrons. This use of the NCIP standard will permit libraries to lend materials directly to patrons of other libraries more like a circulation transaction than traditional ILL.

User Authentication

Dynix will add support for **LDAP** (Lightweight Directory Access Protocol) and for applicable messages from the NCIP standard in future versions of Horizon Information Portal and other products requiring authentication. These stan-

dards will provide industry-approved methods to identify library users against campus registrar databases and the ILS borrower information. This authentication can then be used to provide access to secure areas within the library systems and to other protected information resources available through the library.

School Library Standard

The **Schools Interoperability Framework (SIF)** is an initiative and series of protocols intended to specify a method of data sharing and updates within the various systems that play in the school environment. SIF is not a product, but rather an industry standard supporting a blueprint for school software that will enable diverse applications to interact and share data seamlessly, now and in the future. It is promoted by stake-holding vendors, including Dynix, with both financial and personnel contributions. The goal is to create a framework where, as one portion of the school's electronic information gets updated, related systems are also automatically updated.