The 21st Century Library
Collaborative Services, Standards, and Interoperability

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Overview

- The emerging library environment
- Interoperability
- Key standards
- Designing services for the networked library
A library is...

- A collection of resources
- Services and activities related to the resources
- Tools that assist users in resource discovery and access
- Services that help users
  - answer questions, learn about the collection, learn about the bibliographic tools, and generally connect users to appropriate resources
- An administrative structure that allocates resources
- A place for...
A library in the networked environment...

- **Collections** of resources – local and distributed
- **Collaborative** services and activities
- Tools that assist users in **networked information resource discovery and access**
- **Services that help users**
  - answer questions, learn about the collection, learn about the bibliographic tools, and generally connect users to appropriate resources
- **A management structure** that allocates resources and policies for inter-organization collaboration
- **Extends the reach and range of users**
Networked library components

- **User groups**
  - Local, onsite
  - Distributed, remote

- **Services**
  - Local
  - Collaborative
  - Remote

- **Resources**
  - Information
    - Local
    - Distributed
  - Human

- **Technology**
  - Local applications
  - Distributed applications
  - Standards

- **Management**
  - Local
  - Collaborative
Characterizing the networked library

- Virtual library components
- An environment for provision of
  - Services
  - Resources
- Not a digital library
  - Not all resources available are in digital/electronic form
- An evolving product that responds to
  - Users’ needs
  - Available resources
  - Current and emerging technologies
A focus on services

- Management
  - Funding
  - Policies

- User Groups

- Services

- Technology

- Resources
  - Content
  - Staff
Users drive services

Networked Library Services

User Group  User Group  User Group  User Group
Users drive services

User Group  User Group  User Group  User Group

Networked Library Services

Networked Library Resources
Users drive services

Networked Library Services

Networked Library Resources

Networked Library Technology

User Group  User Group  User Group  User Group
Framework for the networked library

Defined by needs of services respond to needs of user groups.
Framework for the networked library

Services defined by needs of
User Groups

Services offer & use resources

Resources

respond to needs of
Framework for the networked library

Services

defined by needs of

User Groups

respond to needs of

Services offer & use resources

Resources

Resources are collected, organized, managed using technology

Technology
Management of the Networked Library

- Provide direction
- Chooses services
- Acquires funds
- Allocates funds
- Develops staff
- Determines policy
- Arranges agreements
- …
Library services for the networked library

- Infrastructure/internal
  - Collection identification, selection, and acquisition/access
  - Collection building and digitization
  - Collection organization and preparation
  - Inter-organization access
  - Trust and authentication
  - Billing and payment
  - Preservation and archiving

- Patron
  - Resource discovery service
  - Access service
  - Reference service
  - Instruction service
  - Patron account service
Interoperability

Systems and organizations will interoperate!

One should actively be engaged in the ongoing process of ensuring that the systems, procedures and culture of an organisation are managed in such a way as to maximise opportunities for exchange and re-use of information, whether internally or externally.

Paul Miller, 2000
Types of interoperability

Technical
Semantic
Political/Human
Inter-community
Legal
International

(From Paul Miller, 2000)
Technical standards

The problem with standards – too many of them?

- Z39.50 Protocol
- Interlibrary Loan Protocol
- Circulation Interchange Protocol
- Dublin Core Metadata
- Open Archives Initiative
- ...”}

Or, understanding how we need to make them work together?

- HTTP
- HTML
- The suite of XML standards
- SOAP
- Digital Object Identifiers
- ONIX Metadata
- ...
Key standards


- ISO 10160 & ISO 10161: *Interlibrary Loan Application Service Definition & Protocol Specification*

- ANIS/NISO Z39.83: *NISO Circulation Interchange Protocol (NCIP)*

A protocol is a set of formal rules governing the transmission of data.
Z39.50 information retrieval protocol

- Defines specifications, procedures, and structures for computer-to-computer communication
- Messages exchanged between systems focus on information retrieval (searching and retrieving)
- Overcomes problems of searching across multiple database
- Search and retrieve bibliographic and non-bibliographic resources (integrated access)
- Lay a technical foundation for...
  - resource discovery
  - resource sharing
Interlibrary loan protocol

- ISO 10160 & ISO 10161
  - *Interlibrary Loan Application Service Definition & Protocol Specification*

- Specifies rules that permit the exchange of ILL messages between ILL systems

- Allow tracking activities pertaining to ILL transactions and the location of loaned material

- Provides basis for automating ILL requesting, supplying, and tracking
Circulation interchange protocol

- ANSI/NISO Z39.83:
  - NISO Circulation Interchange Protocol (NCIP)
  - Based on the 3M Circulation Protocol
- Focus is the computer exchange of circulation information to support resource sharing
  - To lend items
  - To provide controlled access to electronic resources
  - To facilitate cooperative management of these functions
NCIP Application Areas

- **Direct Consortial Borrowing**
  - Transfers user and item data between disparate circulation applications
  - Allowing an agency:
    - to manage transactions for non-local patrons
    - to provide local control of items belonging to another agency

- **Circulation/Interlibrary Loan Interaction**
  - Use of circulation to track all loans to a user:
    - For items belonging to local collection
    - For items borrowed for user via ILL

- **Self-Service Circulation**
  - Allows users to check out or check in items
Standards Supporting Services

- Each standard enables different services
  - Networked information retrieval
  - Automated interlibrary loan
  - Circulation applications

- But they can work together to support a robust and interoperable information access and resource sharing application
Patron Initiated Interlending Scenario:
Z39.50, ILL Protocol & NCIP

(credit to Barbara Shuh, NLC; used by permission)
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(credit to Barbara Shuh, NLC; used by permission)
Designing services for networked library

- The Library of Texas

- Overarching goal
  - Provide services that extend the reach and range of Texans to information

- A statewide initiative building on
  - The evolving telecommunications infrastructure
  - Computing and networking technologies
  - The treasures and resources of Texas libraries

FOR MORE INFORMATION, VISIT THE LIBRARY OF TEXAS WEBSITE...

http://castor.tsl.state.tx.us/lot
Library of Texas components

- Licensed online databases
  - 60+ databases
  - Full-text, reference materials, journals

- Electronic archive of government information
  - Preserve electronic publications from state agencies

- Comprehensive training
  - Training for use of online databases and other resources

- Resource discovery service – The ZLOT Project
ZLOT Project

The Z Implementation Component of the Library of Texas

Design and planning for:
- Resource discovery service
- Resource access service

Build consensus on functional requirements

Develop an overall architecture for LOT

Formalize the requirements in technical specifications

Demonstrate feasibility in proof of concept implementations

FOR MORE INFORMATION, VISIT THE ZLOT PROJECT WEBSITE...

http://www.unt.edu/zlot
Resource discovery service

- Discovery services
  - Extends the reach and range of a user across
    - Organizational, collections, and format boundaries
  - A variety of tools and approaches for
    - Discovering the existence of appropriate resources
    - Identifying and selecting useful resources

- Search and retrieval services are core
  - Single repository searching
  - Broadcast searching across similar repositories
  - Integrative searching across diverse resources
Central repository

Graphic by Kevin Marsh, Texas State Library and Archives Commission. Used by permission.
Customized access

Graphic by Kevin Marsh, Texas State Library and Archives Commission. Used by permission
Standards-based approach

Graphic by Kevin Marsh, Texas State Library and Archives Commission. Used by permission
Functional requirements

- A common interface for simple and advanced searching across resources
- Escape to native interfaces
- Common interface yet customizable for local library presence
- Tools to help users select resources to search
- Multilingual interfaces
- Well-organized results (by topic, by type of resource)
- Indications of availability and “how to get”
Resource discovery service

Content or Resource Collections
1. TexShare Databases
2. E-books
3. Electronic Archive of Government Information
4. Statewide Virtual Catalog

Representations of Resources
1. Proprietary Records
2. Indices of Full-text Files
3. Dublin Core Metadata Records
4. MARC Records

LOT Search & Retrieval Interface
1. Broadcast Searching
   a. Similar Resources
   b. Dissimilar Resources
2. Common Retrieval Display

Middleware
1. Translates Searches
2. Formats Retrievals
3. Interacts with Multiple IR Systems

Information Retrieval Systems
Virtual catalog

Single user search as multiple queries to multiple catalogs

Z39.50 Client

User Interface

Resulting Virtual Catalog

USER PERCEIVES A SINGLE SEARCH TO SINGLE LOGICAL RESOURCE

Catalog 1
Catalog 2
Catalog 3
Catalog 4
Catalog N
Integrating search & retrieval

- Dynamic selection of two or more resources
  - Library catalogs
  - Licensed databases
  - Texas Record and Information Locator Service
- Search using a common search interface provided by Z39.50 and other technologies
- Customized user interfaces for various audiences
Resource discovery and metadata

- IR System
  - Metadata
  - Images
- IR System
  - Metadata
  - Licensed Online Databases
- IR System
  - Metadata
  - Web Resources
- IR System
  - Metadata
  - Books

Information Retrieval Systems
Resource Descriptions
Information Resources
Z39.50 resource discovery

Diagram showing the flow of information from Z Server to IR System, then to Metadata, and finally to Images, Licensed Online Databases, Web Resources, and Books. The process involves Information Retrieval Systems and Resource Descriptions as inputs and Information Resources as outputs.
Functional requirements implications

- Interface
  - Makes visible the functionality
  - Hides the complexity
  - Manages changes in resources available
  - Supports appropriate standards

- Target servers
  - Provides functionality available through interface
  - Serves local and non-local users
  - Supports appropriate standards
ZLOT architecture

- **CONTENT LAYER**
  - Z39.50
  - OTHER

- **SERVICES LAYER**
  - HTTP

- **USER LAYER**

Transaction
Access
Authentication

Resource Discovery

- TexShare
- TRAIL
- VC
- Others

Library Home Office Mobile
### Quick Select by Library Type
- Academic Libraries
- Public Libraries
- Special Libraries

### Texas Libraries
- Abilene Library Consortium
- Austin College
- Bedford College
- Dallas Community College
- Hurst Public Library
- Northeast Texas CC
- Our Lady Of The Lake University
- Roanoke Public Library
- Southern Methodist
- Tarleton State
- Texas Christian University
- UT Austin
- UT El Paso

### Featured Libraries
- Texas State Library
- Trail

### Made in Texas
- Gammell's Laws of Texas
- Texas Register

### Web Resources
- AskJeeves!
- Google
- SiteSource

### TexShare Databases
TexShare Databases can only be accessed by authenticated users. To login, [click here](#).
Resource access service

- Access services
  - Completes cycle of information seeking
  - Technology and policies to get materials to user or desktop
  - Mediated and/or non-mediated services
- Mechanisms
  - Interlibrary loan
  - Courier
  - Authentication services for direct delivery
Opportunities and Challenges

So many users, resources, technologies, standards!

- A service-based framework provides a context for rational response:
  - For choosing and developing services
  - For identifying and selecting appropriate technologies and standards
- The networked library requires more agreements and support of standards and ...
- Collaboration: vendors, content providers, libraries
References

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- ZLOT Project
  
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