

# The 21<sup>st</sup> Century Library

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## Collaborative Services, Standards, and Interoperability

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# Overview

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

# A library is...

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- 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...

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- **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

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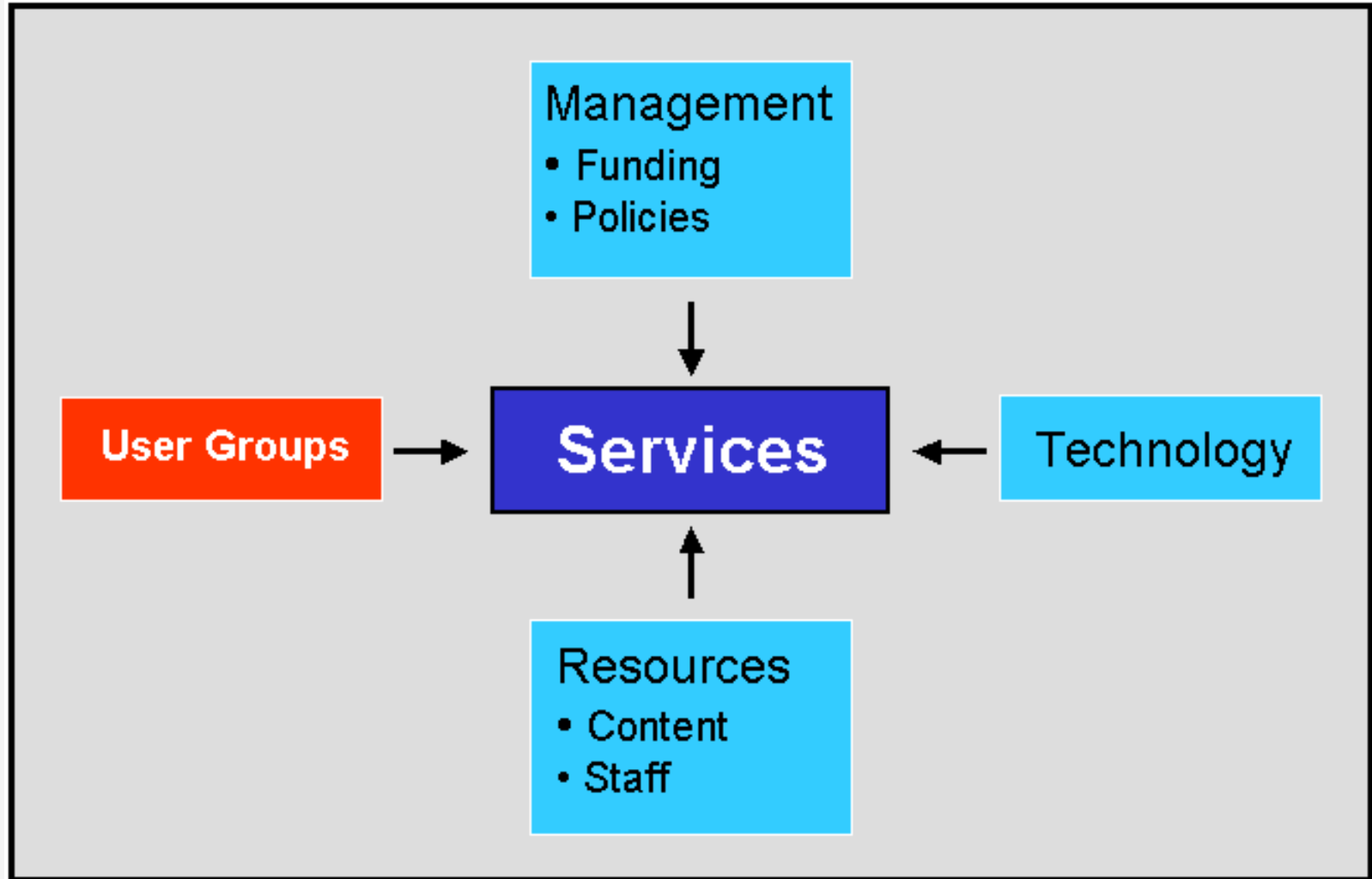
- User groups
  - Local, onsite
  - Distributed, remote
- Services
  - Local
  - Collaborative
  - Remote
- Resources
  - Information
    - Local
    - Distributed
  - Human
- Technology
  - Local applications
  - Distributed applications
  - Standards
- Management
  - Local
  - Collaborative

# Characterizing the networked library

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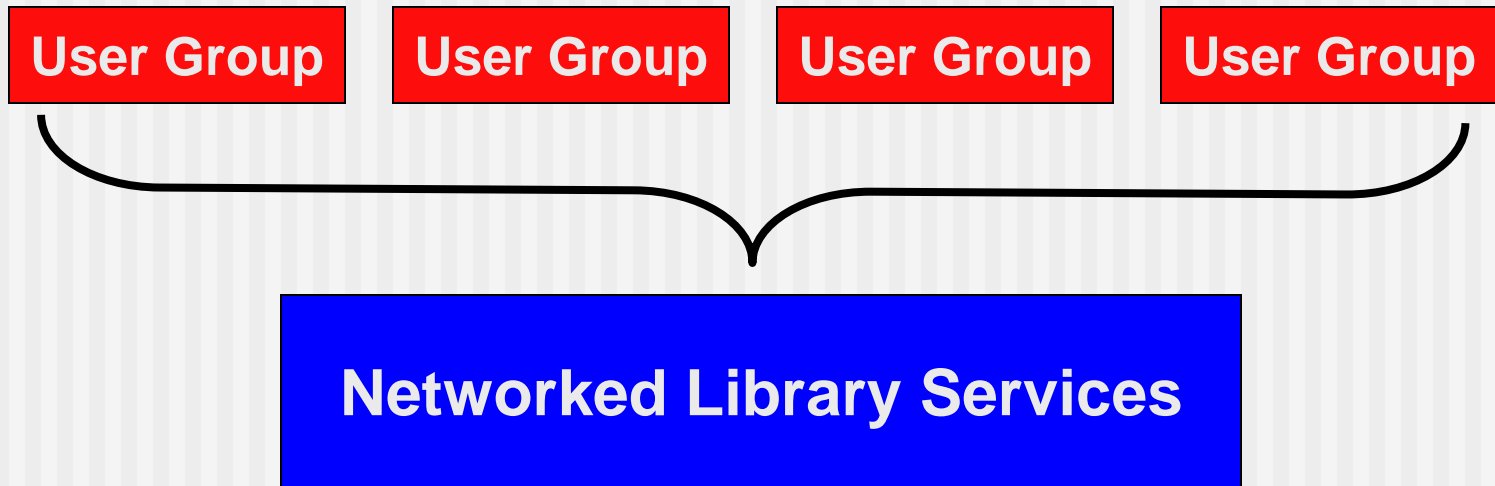
- Virtual library components
- An environment for provision of
  - Services
  - Resources
- Not a digital library
  - Not all resources available are in digital/electronic form
- An evolving product that responds to
  - Users' needs
  - Available resources
  - Current and emerging technologies

# A focus on services



# Users drive services

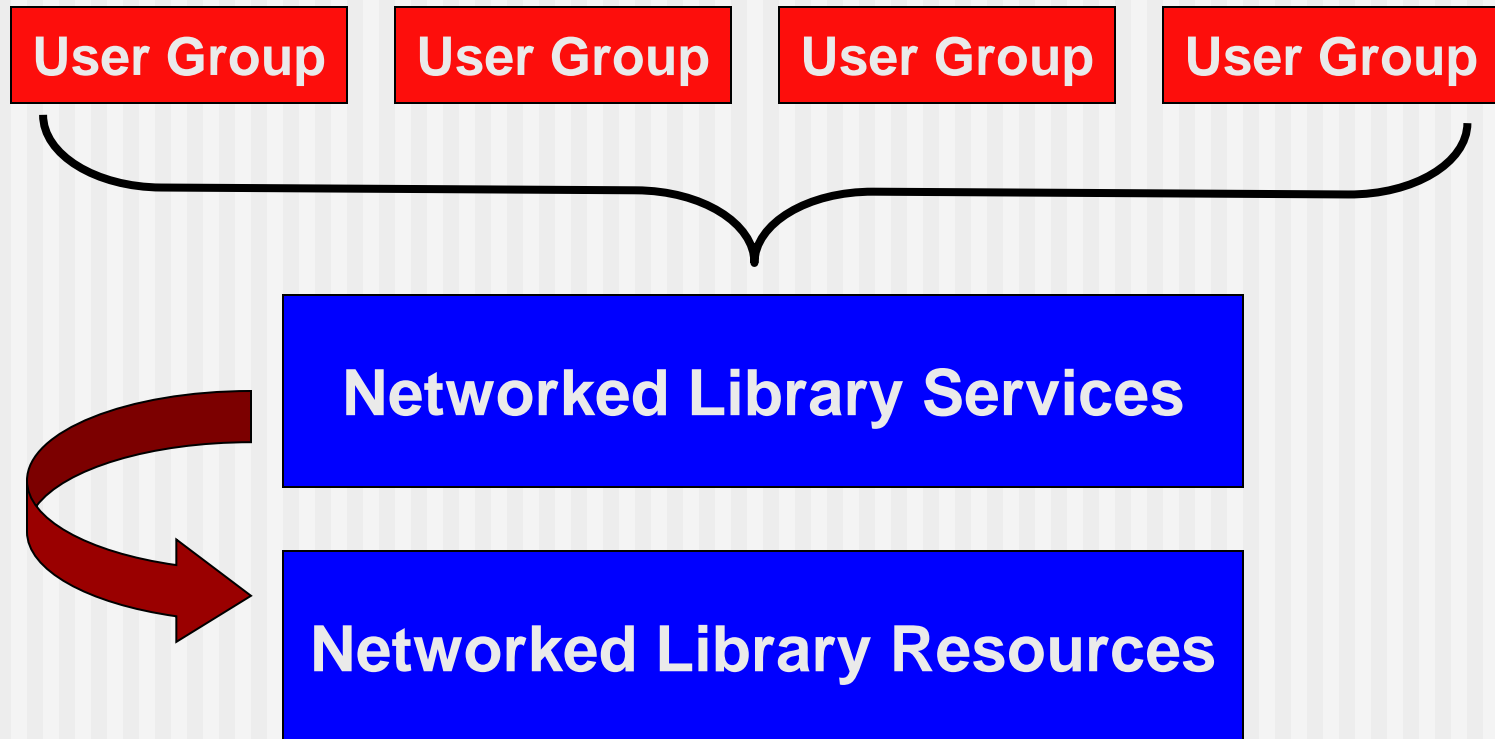
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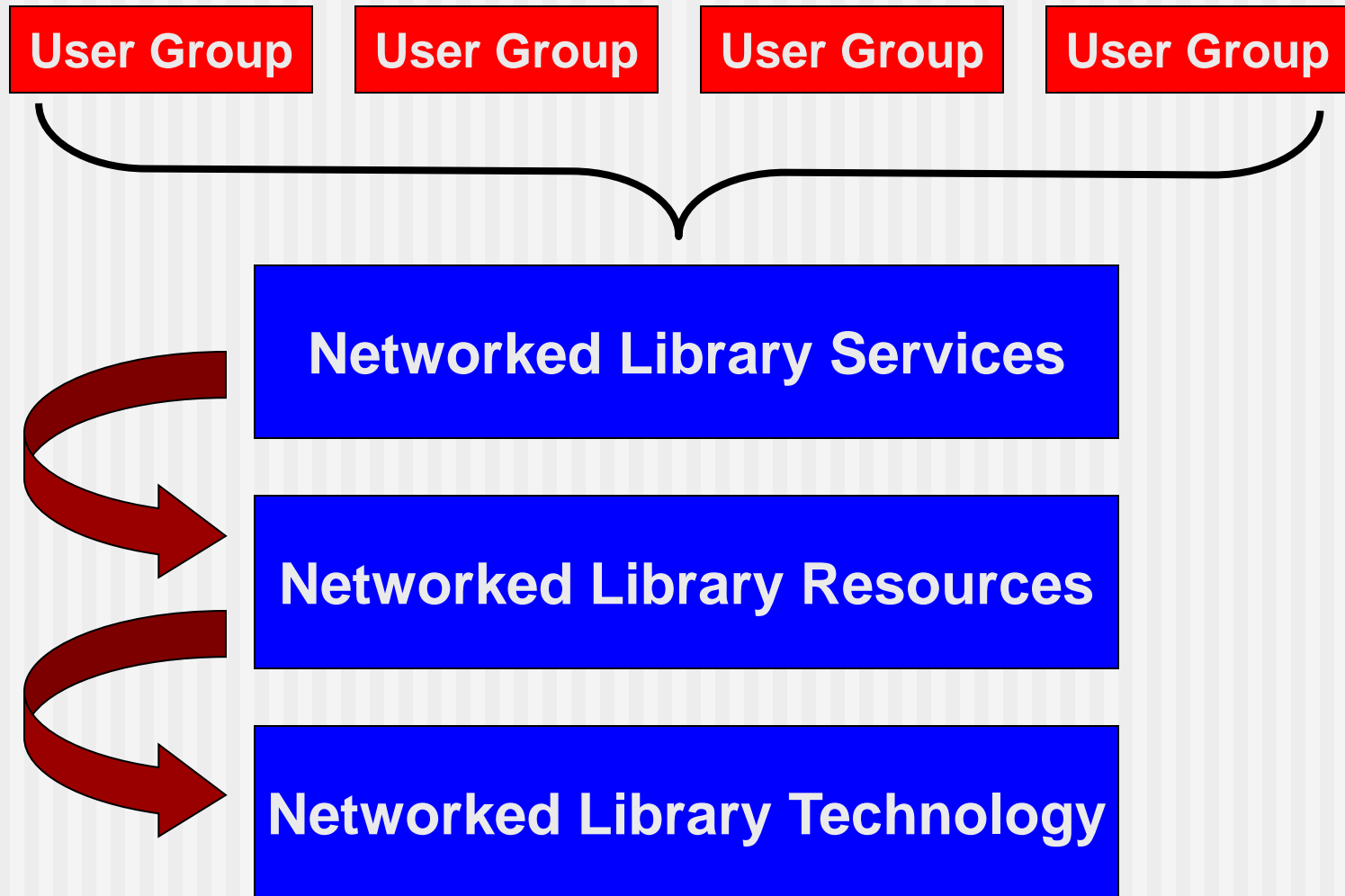
# Users drive services

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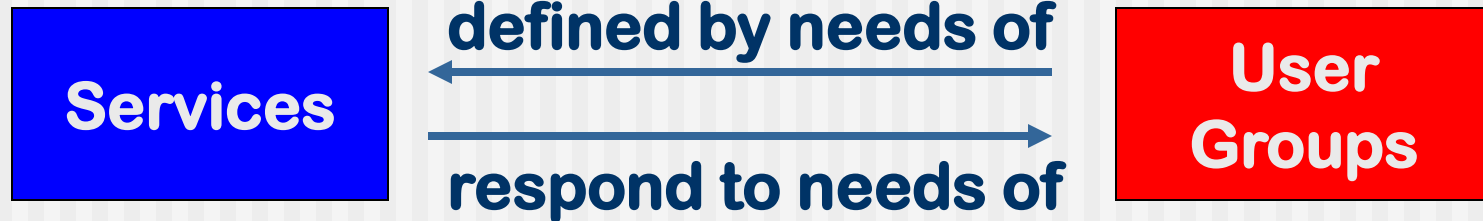
# Users drive services

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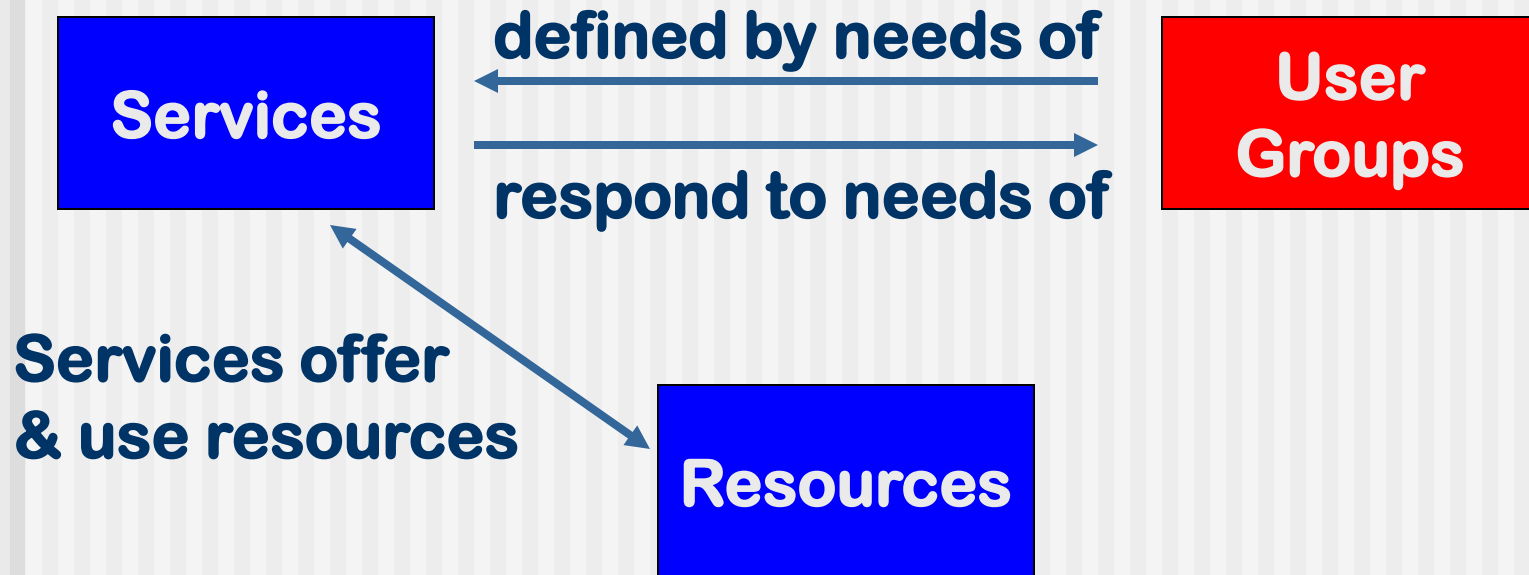
# Framework for the networked library

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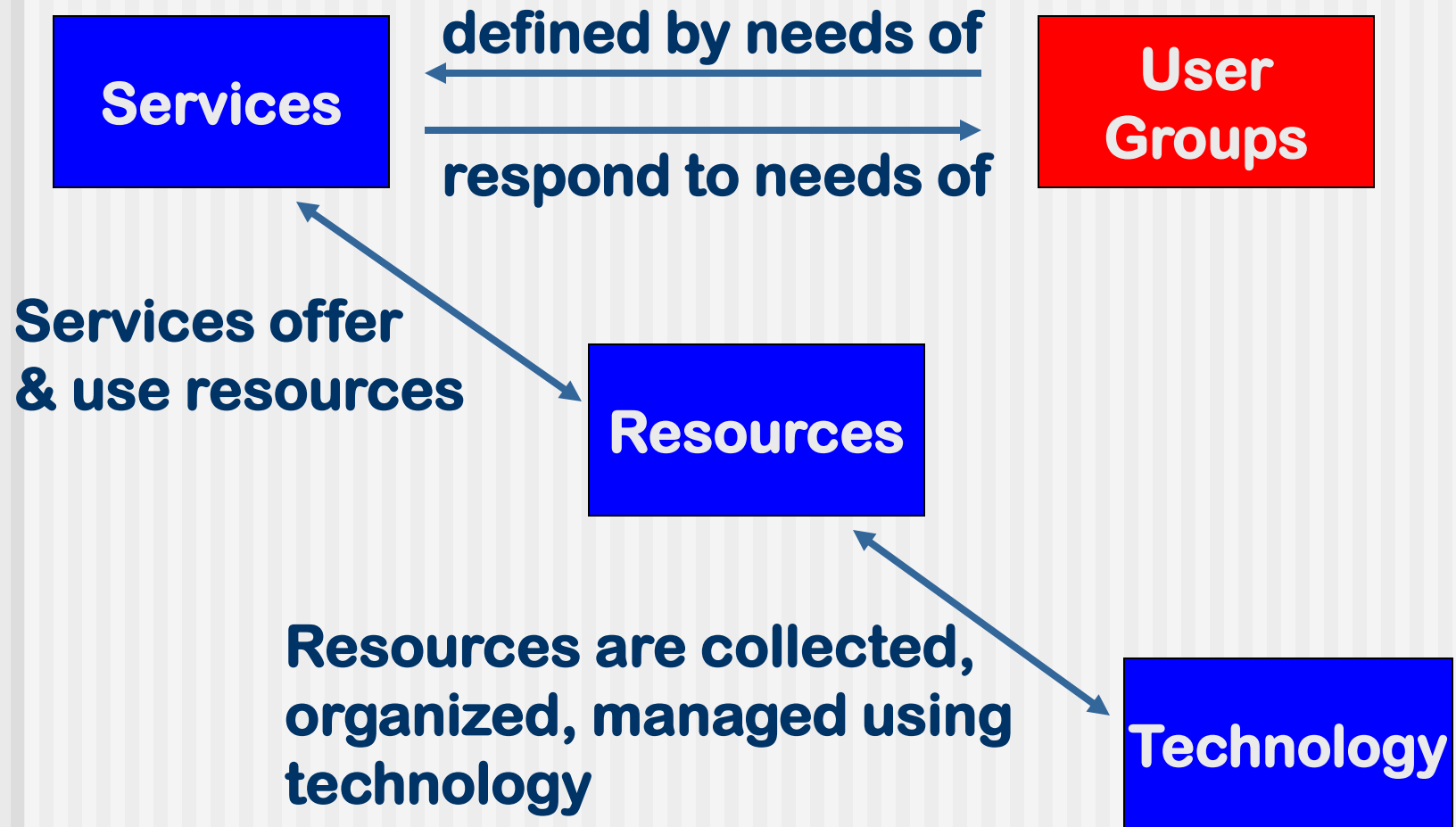


# Framework for the networked library

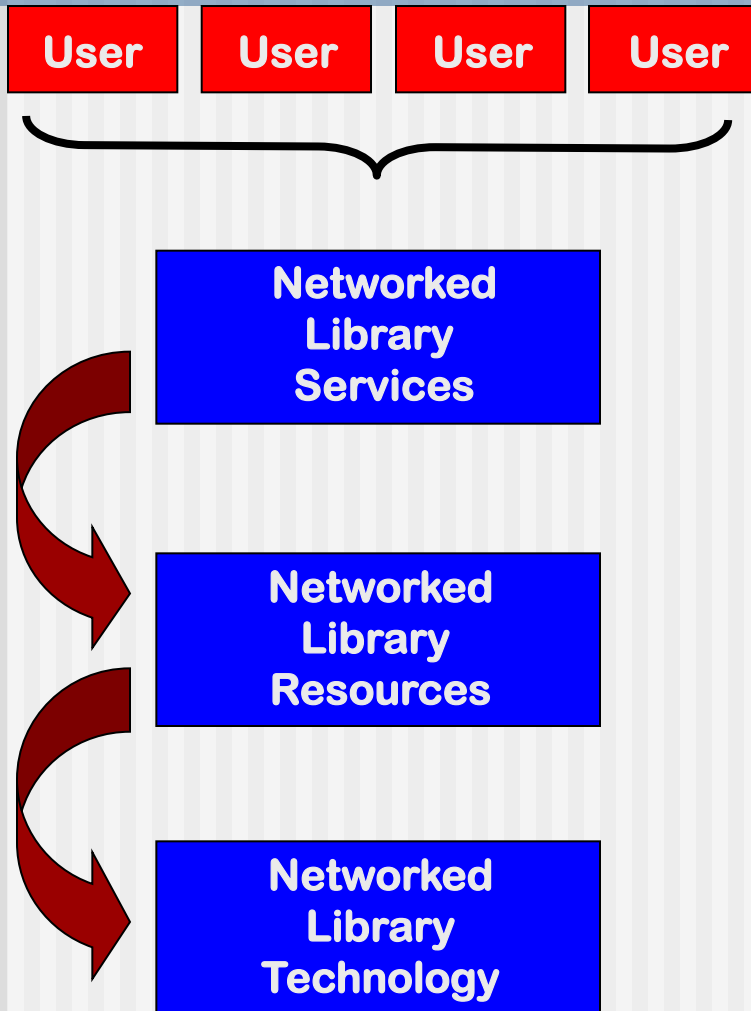
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# Framework for the networked library



# Management



## 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

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## ■ 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

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## **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

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Technical  
Semantic  
Political/Human  
Inter-community  
Legal  
International

**(From Paul Miller, 2000)**

# Technical standards

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- The problem with standards – too many of them?

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- Z39.50 Protocol
  - Interlibrary Loan Protocol
  - Circulation Interchange Protocol
  - Dublin Core Metadata
  - Open Archives Initiative
  - ...
  - HTTP
  - HTML
  - The suite of XML standards
  - SOAP
  - Digital Object Identifiers
  - ONIX Metadata
  - ...

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

# Key standards

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- ANSI/NISO Z39.50: (ISO 23950): *Information Retrieval (Z39.50): Application Service Definition and Protocol Specification*
- 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

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- 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

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- 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

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- 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

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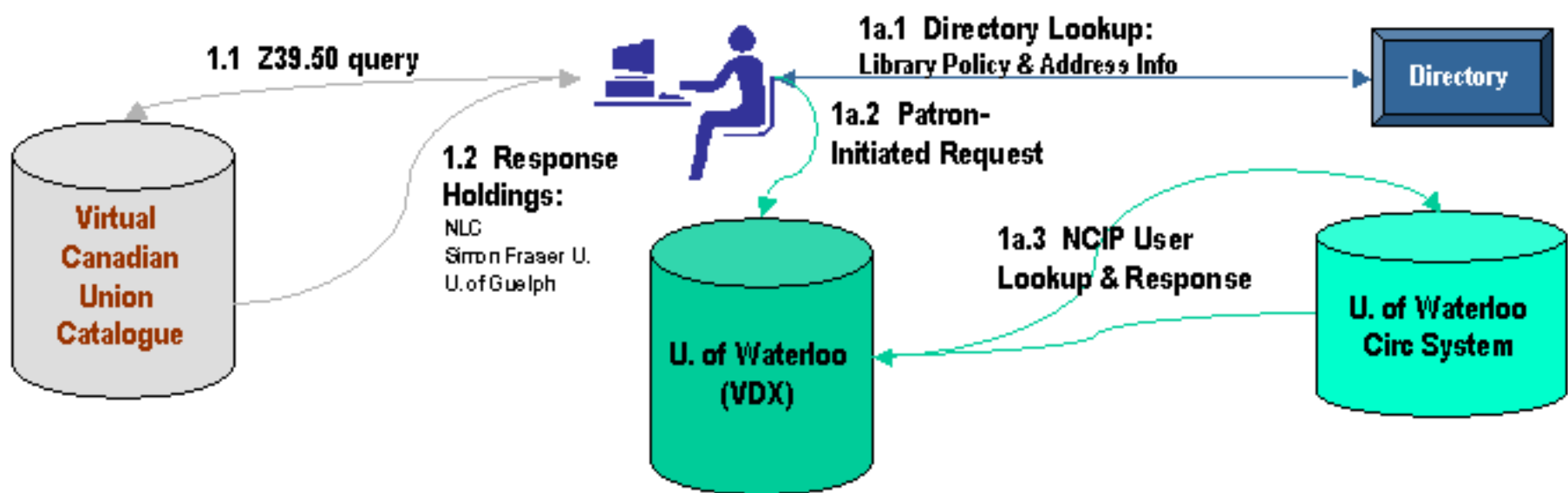
- Direct Consortial Borrowing
  - Transfers user and item data between disparate circulation applications
  - Allowing an agency:
    - to manage transactions for non-local patrons
    - to provide local control of items belonging to another agency
- Circulation/Interlibrary Loan Interaction
  - Use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

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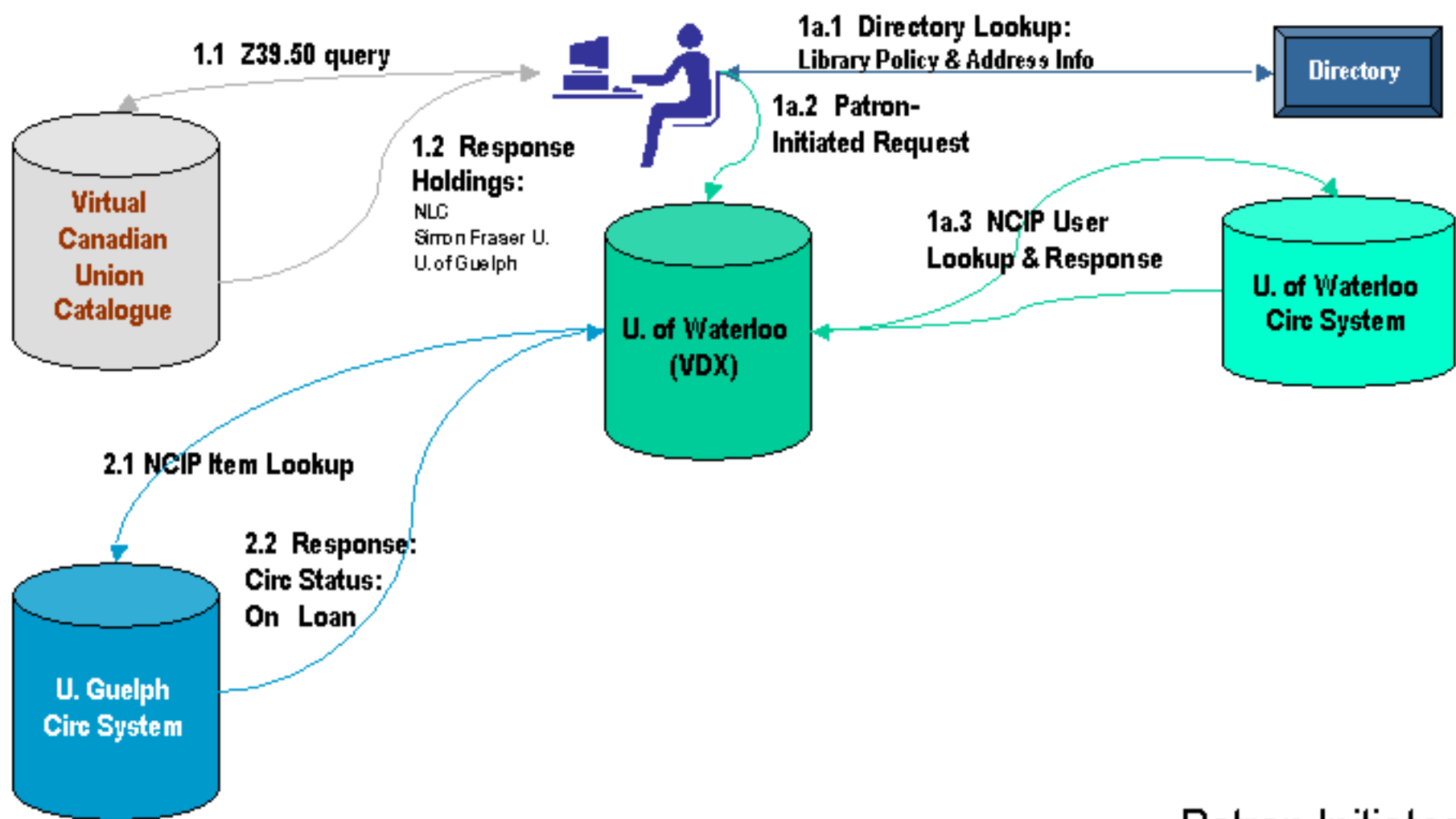
- Each standard enables different services
  - Networked information retrieval
  - Automated interlibrary loan
  - Circulation applications
- But they can work together to support a robust and interoperable information access and resource sharing application





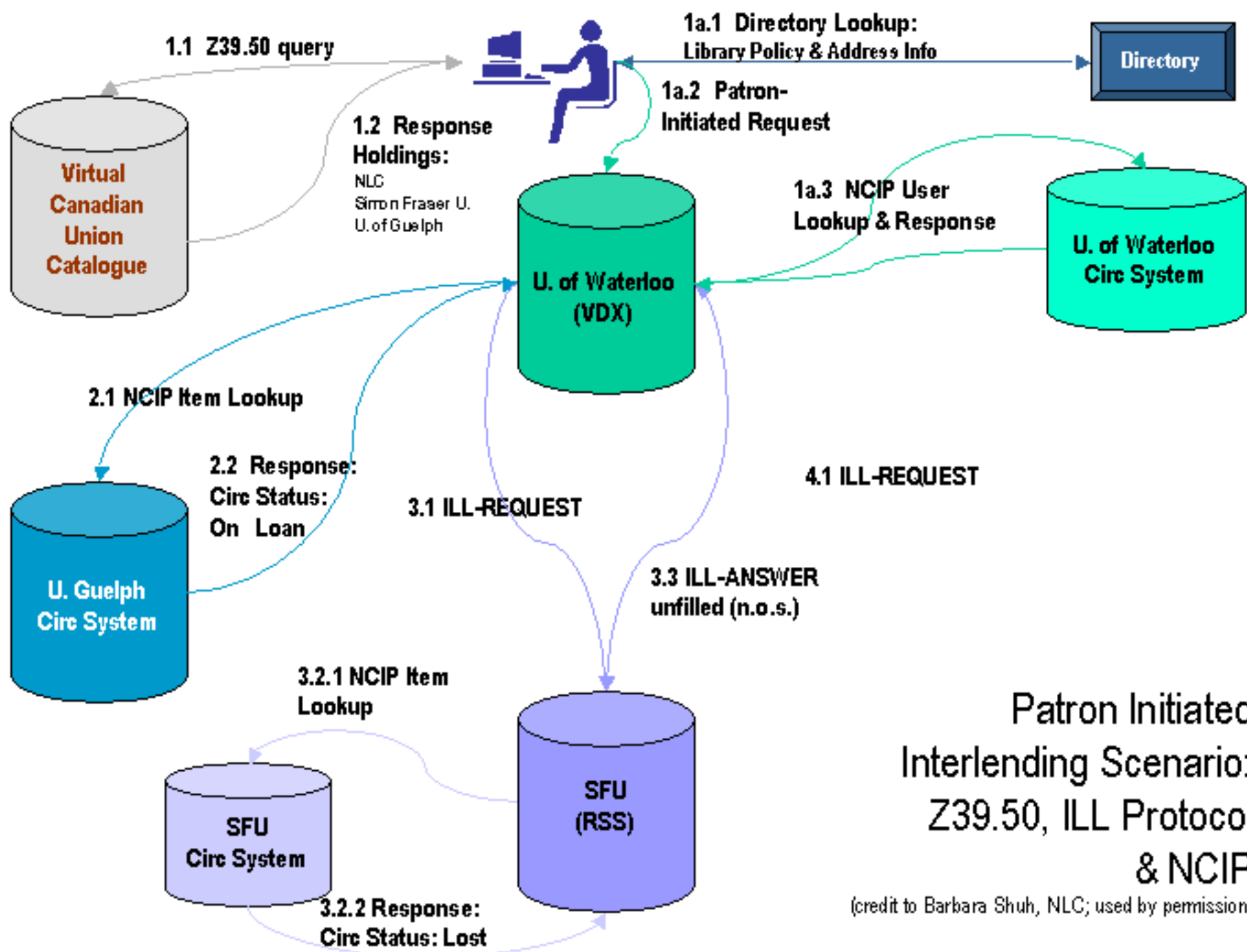
Patron Initiated  
Interlending Scenario:  
Z39.50, ILL Protocol  
& NCIP

(credit to Barbara Shuh, NLC; used by permission)



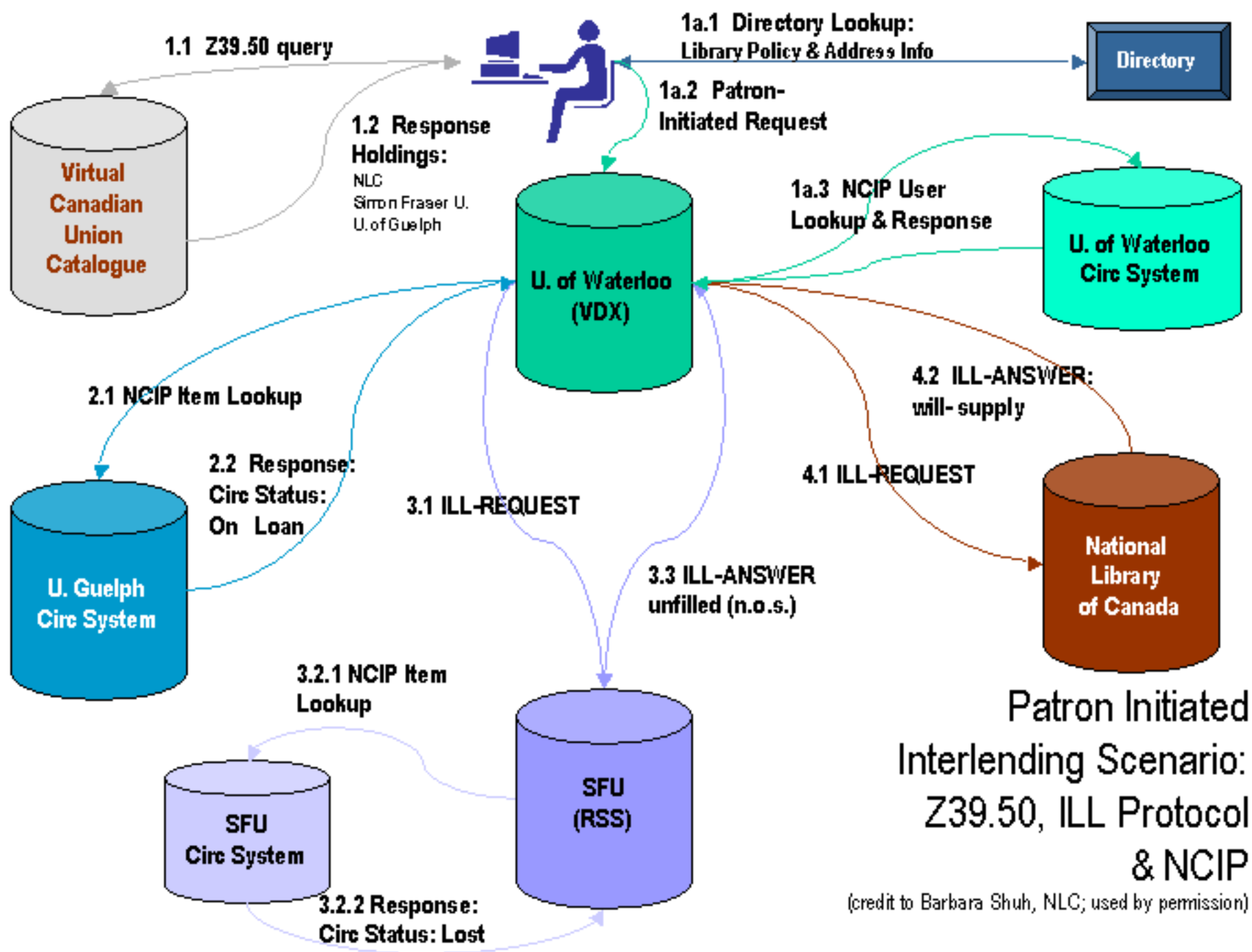
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(credit to Barbara Shuh, NLC; used by permission)



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# 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

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- 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>

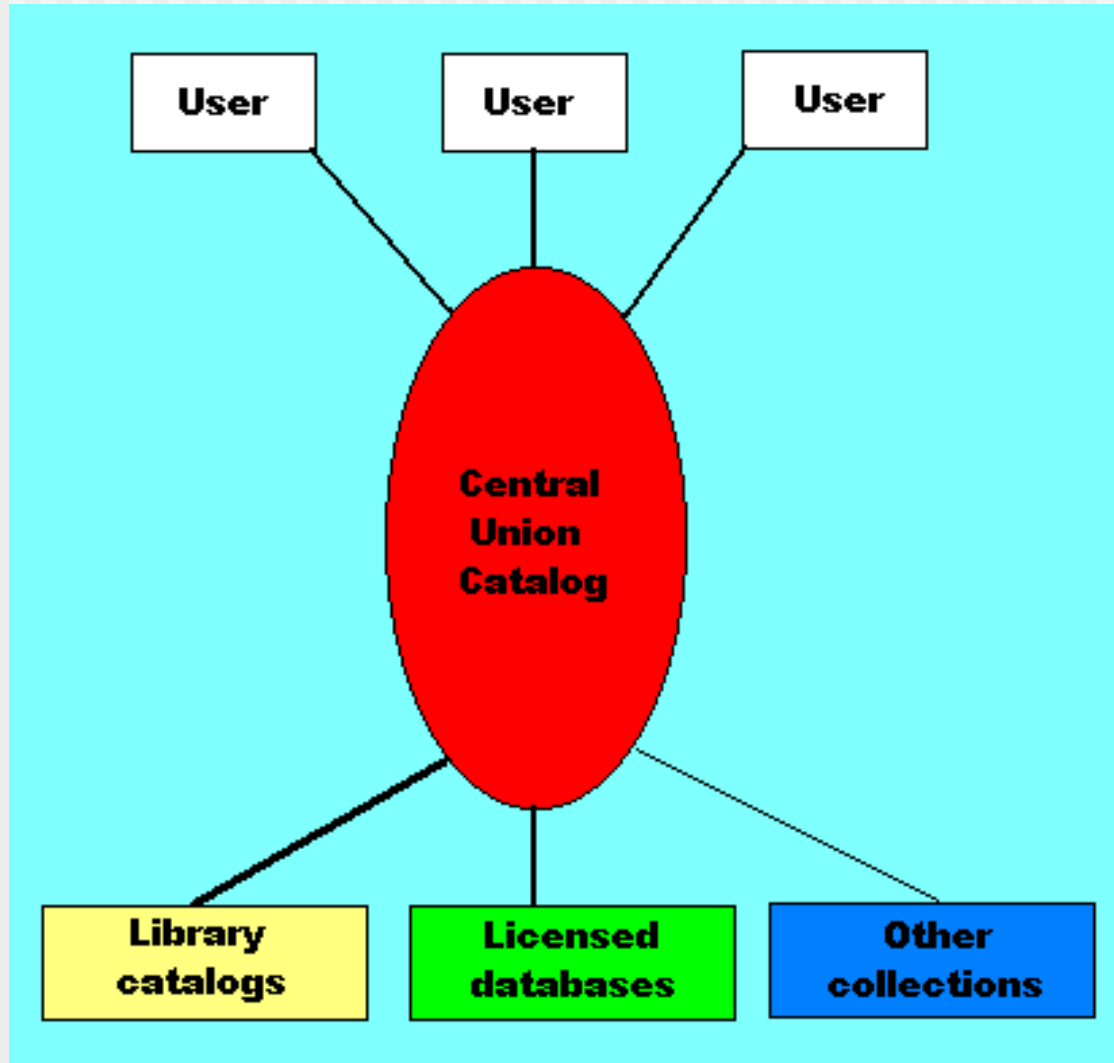
# Resource discovery service

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- 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

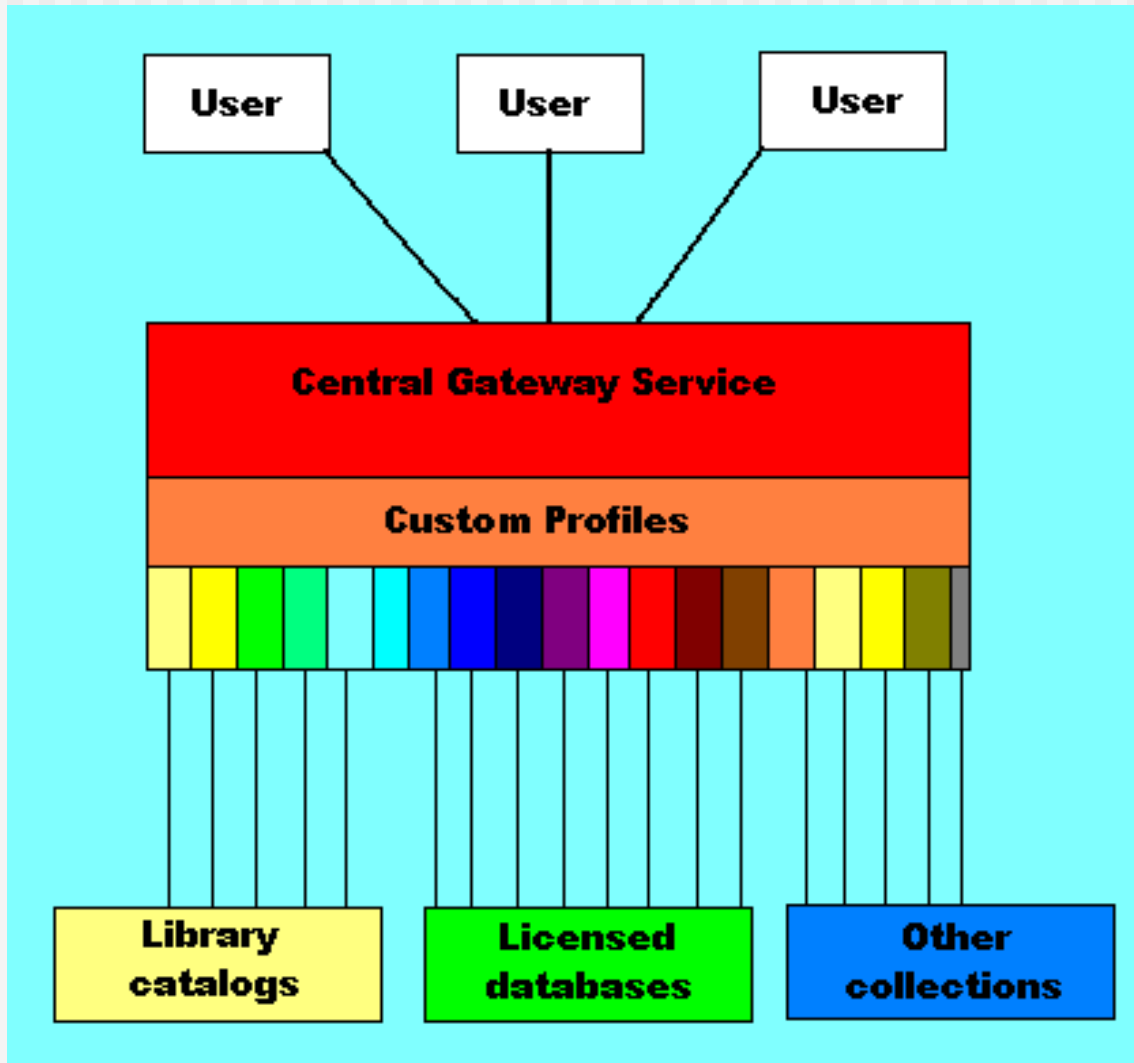


# Central repository



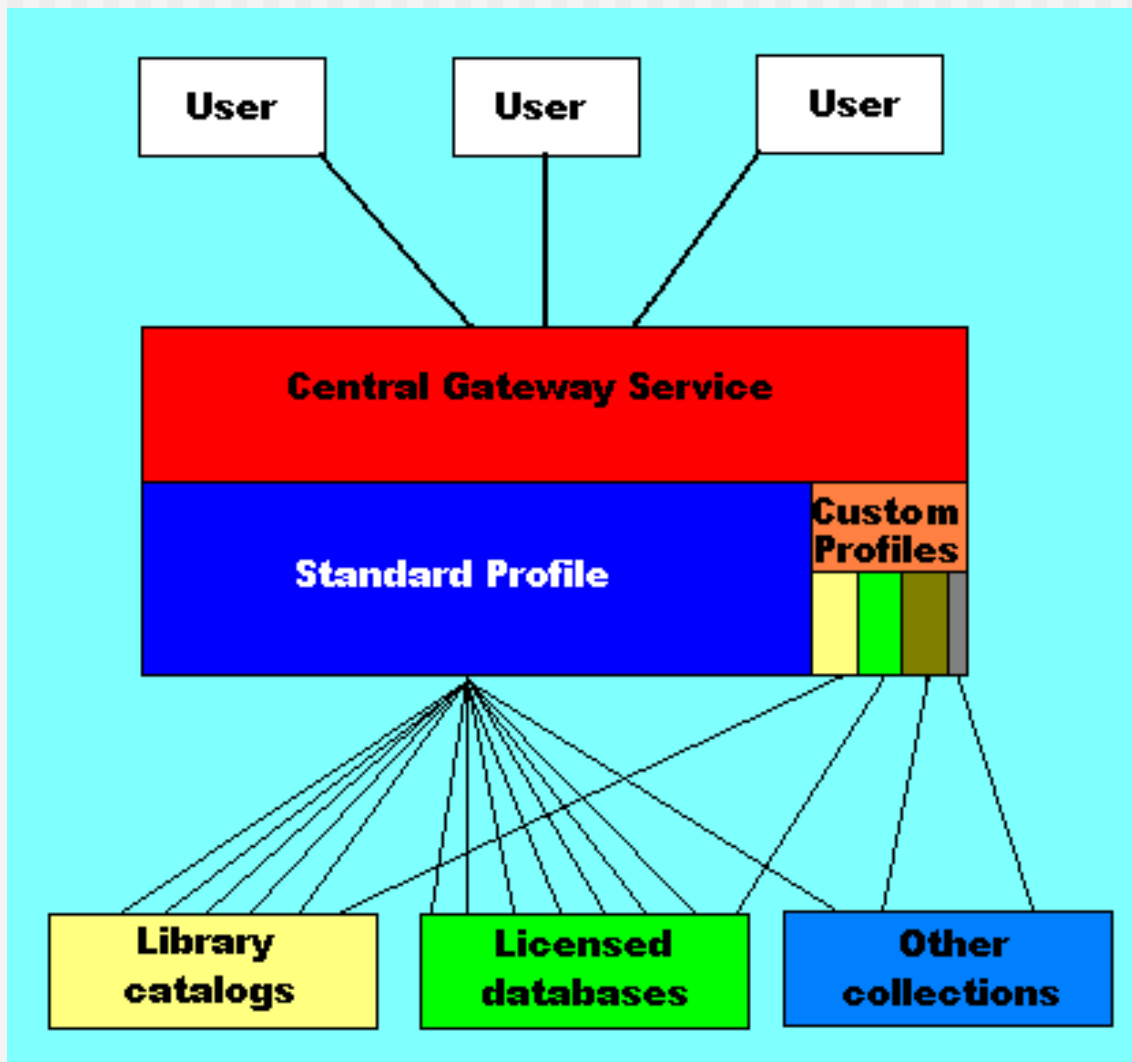
Graphic by Kevin Marsh, Texas State Library and Archives Commission. Used by permission

# 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

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- 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

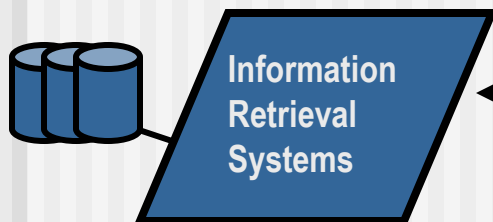


## Middleware

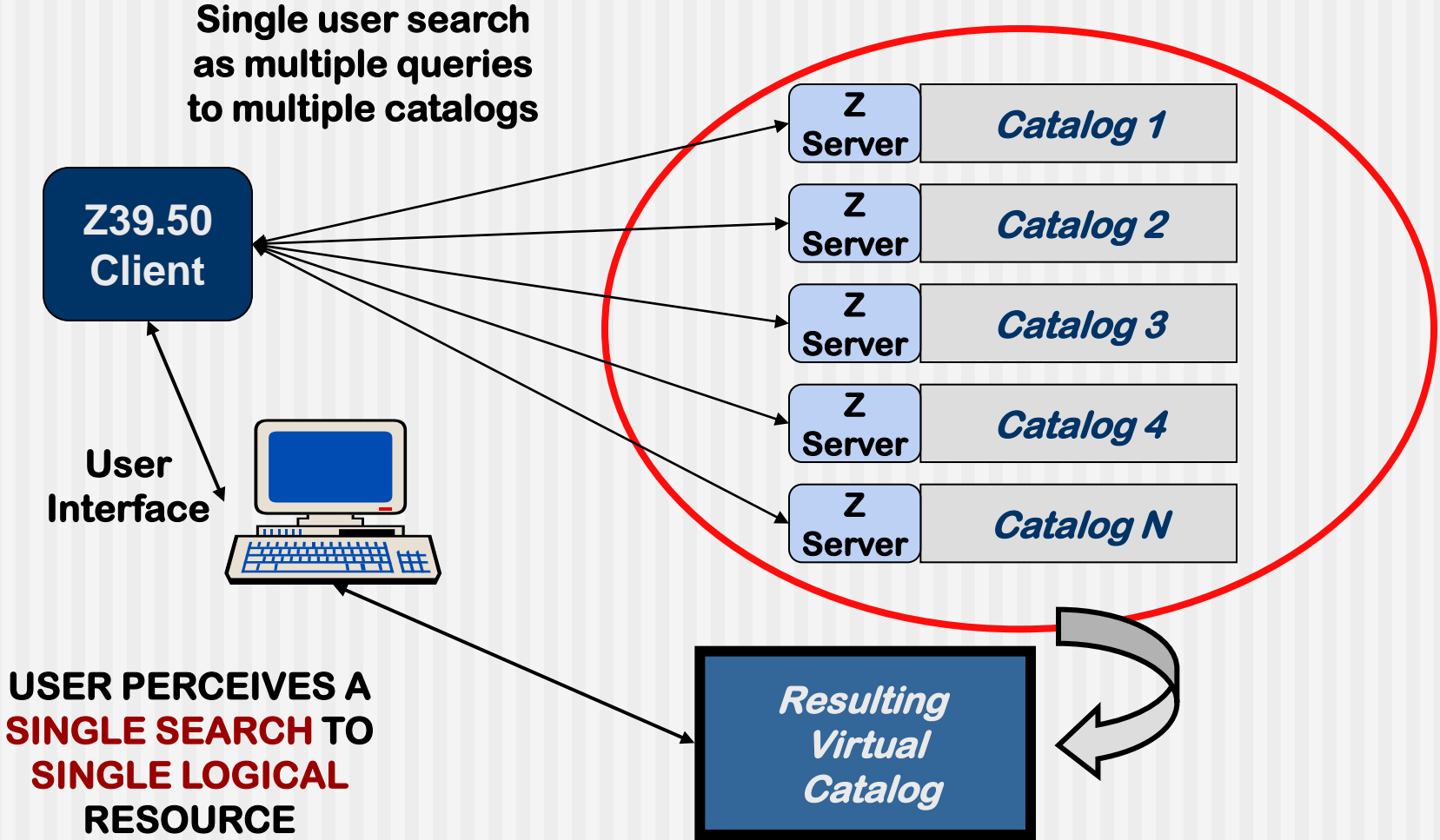
1. Translates Searches
2. Formats Retrievals
3. Interacts with Multiple IR Systems

## LOT Search & Retrieval Interface

1. Broadcast Searching
  - a. Similar Resources
  - b. Dissimilar Resources
2. Common Retrieval Display



# Virtual catalog

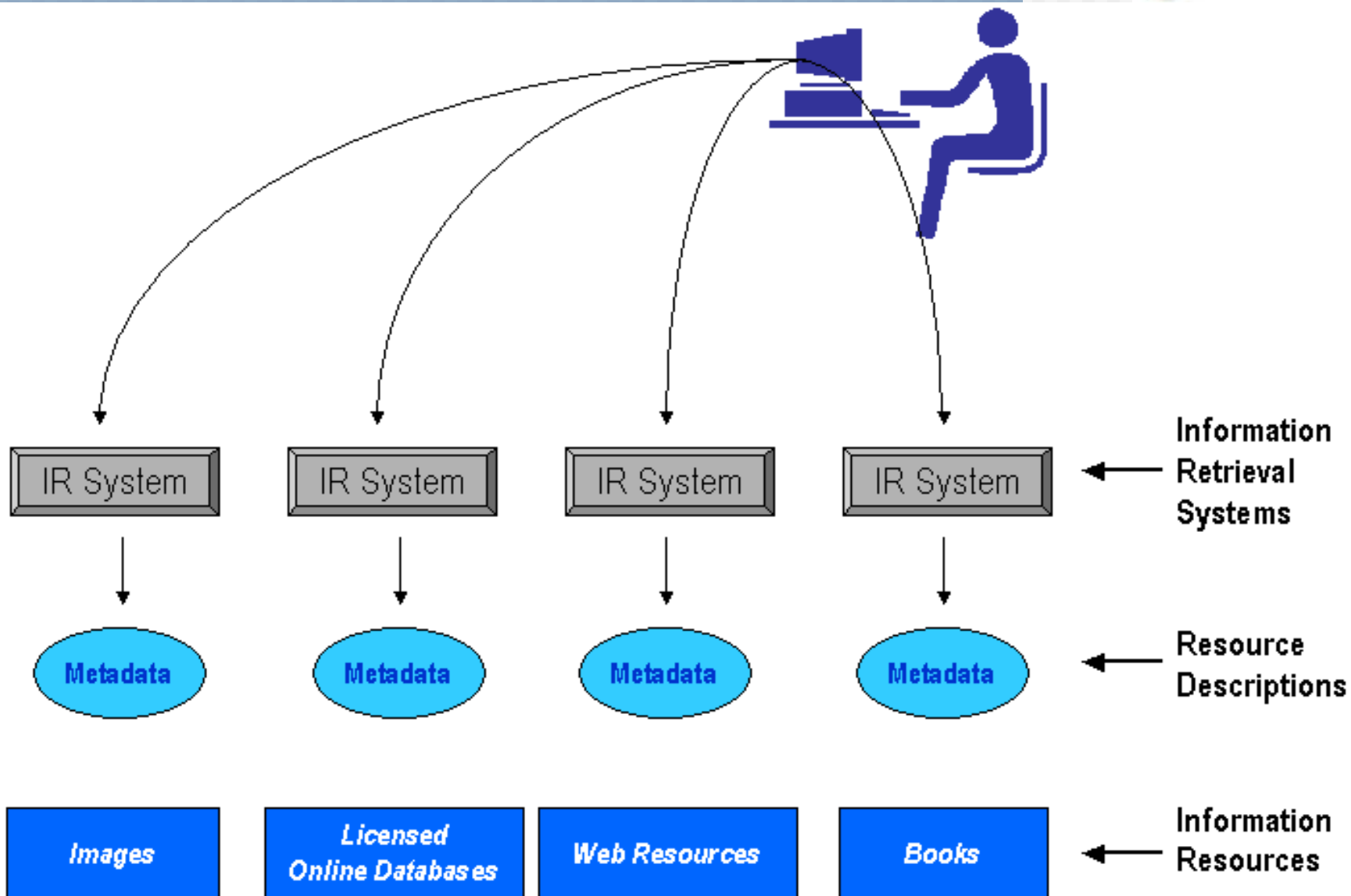


# Integrating search & retrieval

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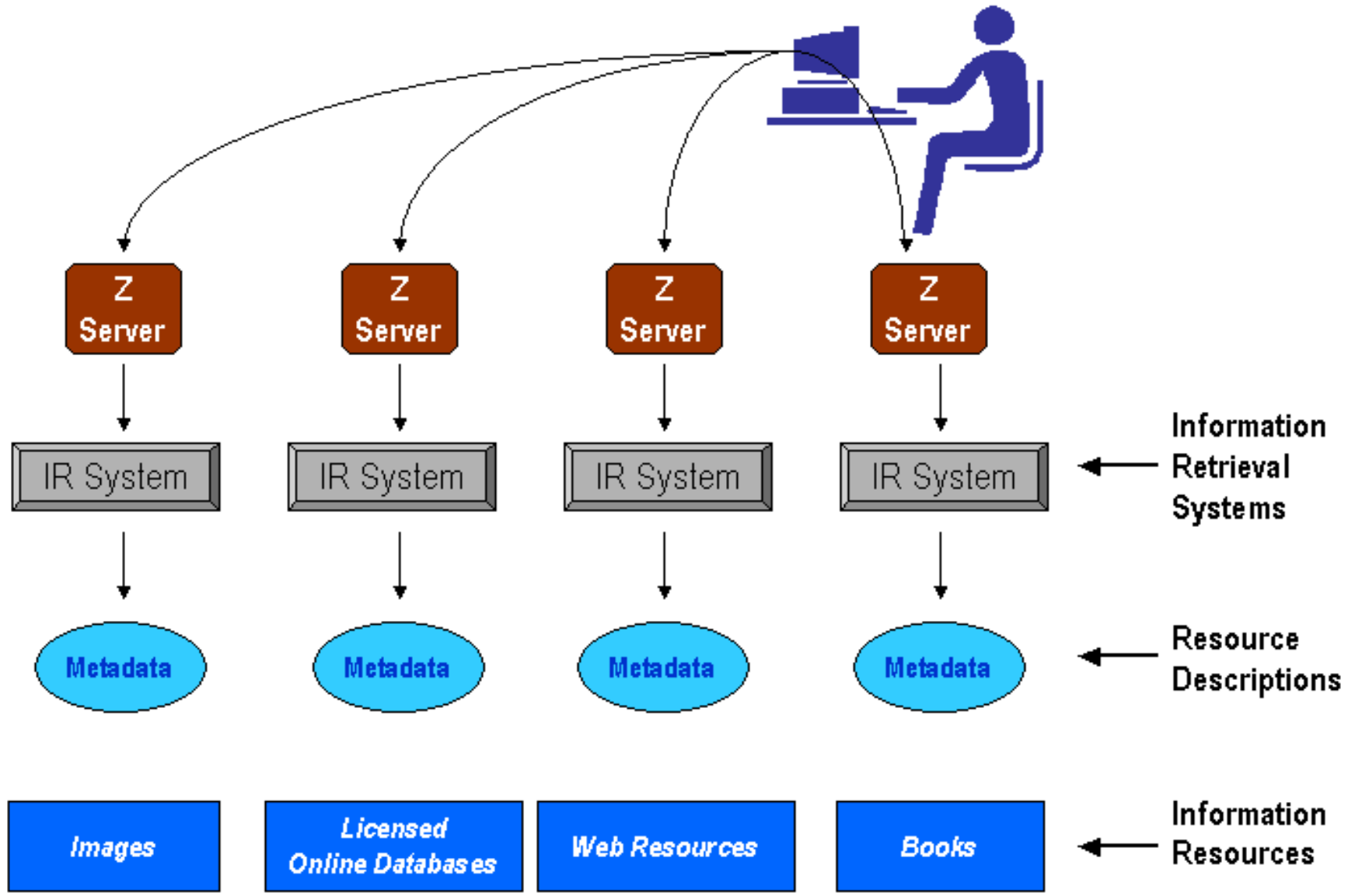
- Dynamic selection of two or more resources
  - Library catalogs
  - Licensed databases
  - Texas Record and Information Locator Service
- Search using a common search interface provided by Z39.50 and other technologies
- Customized user interfaces for various audiences

# Resource discovery and metadata





# Z39.50 resource discovery





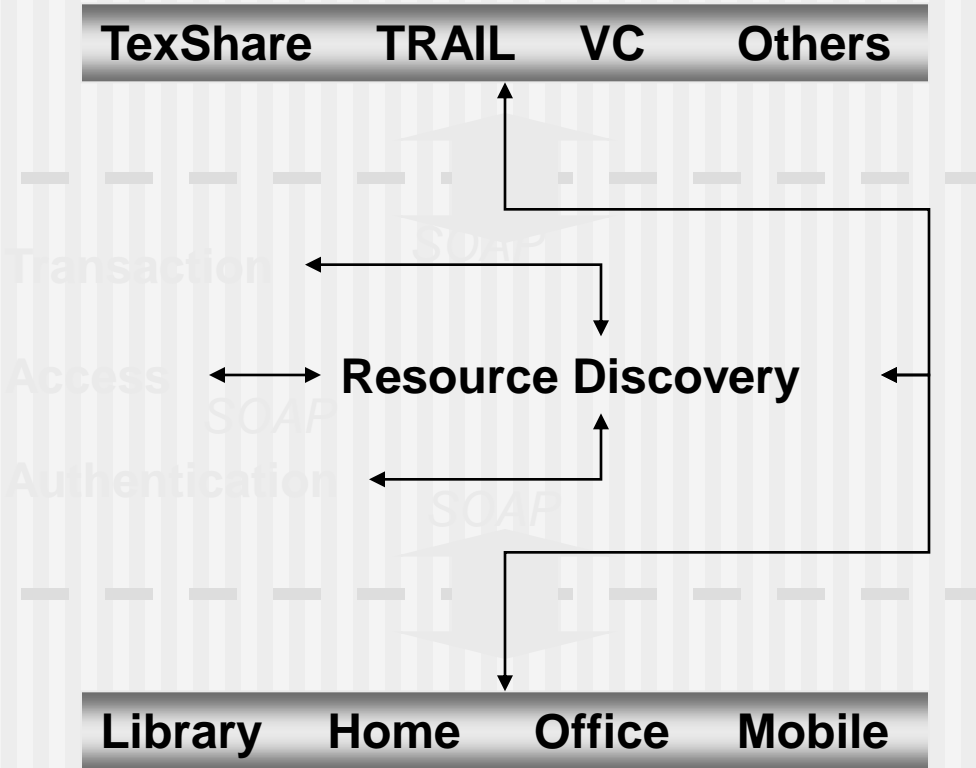
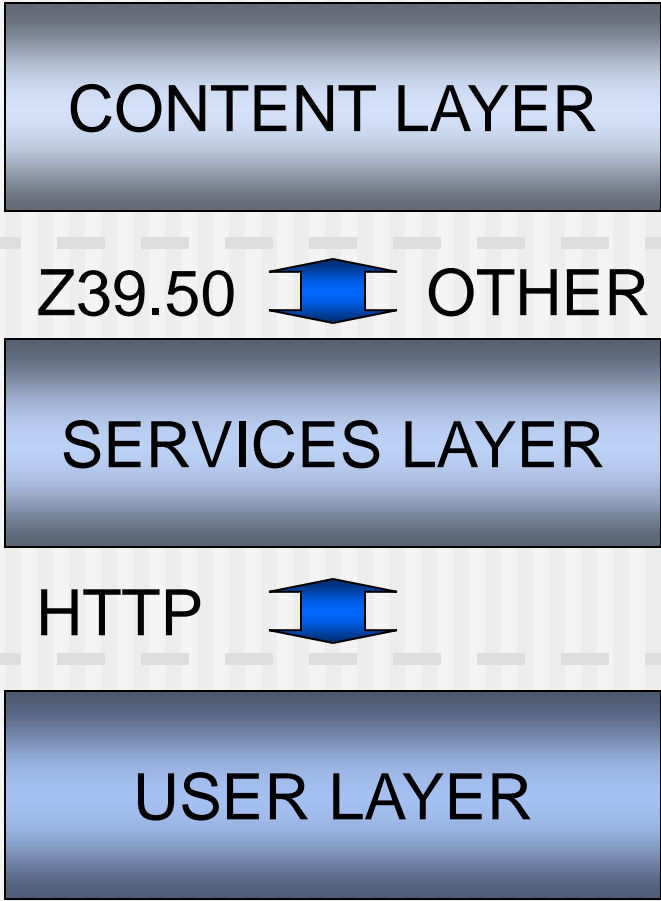
## ■ Interface

- 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





**Subjects**

**Libraries**

- [Public](#)
- [Academic](#)
- [References](#)

**Collections near you**

- [Less than 10 miles](#)
- [Within 25 miles](#)
- [All](#)

**My own databases**

- [MoenTest](#)
- [Saved databases](#)
- [Create new](#)

**My stored searches**

[Help](#)

[Español](#)

**My databases > MoenTest**

[MoenTest](#)

[Saved databases](#)

[Create new](#)

[Search](#)

Advanced search

Search in catalogues:

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Encyclopedia Americana      | <input checked="" type="checkbox"/> Google Web Index     |
| <input checked="" type="checkbox"/> Arlington Public Library    | <input checked="" type="checkbox"/> Hurst Public Library |
| <input checked="" type="checkbox"/> Baylor University Libraries | <input checked="" type="checkbox"/> Wildental Library    |
| <input checked="" type="checkbox"/> Academic Search Premier     | <input checked="" type="checkbox"/> TRAIL                |

# The Library of Texas



All Search

For Kids

Libraries

Genealogy

Government

Maps

Museums

Newspapers

Travel

Reference

TV/Radio

Go Back

Help

Advanced Search

Exit

search:

Go!

[Clear All Selections](#)

Hi, **GUEST!** Welcome to the Library of Texas On-line Project.

## Quick Select by Library Type

- Academic Libraries
- Public Libraries
- Special Libraries

## Texas Libraries

- Abilene Library Consortium
- Austin College
- Bedford Public Library
- 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
- Arlington Public Library
- Baylor University
- Central Texas College
- Fort Stockton Public Library
- Joe A Hall HS/Community
- North Richland Hills Public
- Plano Public Library
- St. Edwards University
- Sul Ross State University
- Taylor Public Library
- University of North Texas
- UT Austin Law

## 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

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## ■ 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

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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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- Interoperability: What is it and why should I want it? (Paul Miller)  
<http://www.ariadne.ac.uk/issue24/interoperability/intro.html>
- A Service-Based Approach for Virtual Libraries and Designing & Demonstrating a Resource Discovery Service for the Library of Texas (Moen and Murray)  
<http://www.unt.edu/wmoen/publications/MoenVirtualLibrariesZLOTFall2002.pdf>
- ZLOT Project  
<http://www.unt.edu/zlot>