

THE FLORIDA VIRTUAL LIBRARY

PLAN FOR STATEWIDE IMPLEMENTATION

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PREFACE

The purposes of this Plan for Statewide Implementation of the Florida Virtual Library are to:

- Describe the concept of the Florida Virtual Library.
- Identify the technology components to be deployed to achieve the creation of the Florida Virtual Library.
- Recommend strategies and approaches for the implementation of the Florida Virtual Library.

A Planning Team of representatives of Florida libraries, representatives of the Division of Library and Information Services, the Florida Library Network Council, and the Northeast Florida Library Information Network (acting as fiscal agent for the project) has worked to define the components of the Florida Virtual Library and to conduct focus groups throughout the state to determine interest in and support for the concept.

RMG Consultants, Inc. (RMG) has worked with the Planning Team to define resource sharing and other technologies that might be implemented for the Florida Virtual Library and to identify possible library technology products and systems and methods for accomplishing resource sharing goals.

This plan for implementation of the Florida Virtual Library is the result of the strategic planning process conducted with the Planning Team.

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0 EXECUTIVE SUMMARY

Florida libraries are poised for a statewide approach to information access and resource sharing. A number of suitable technologies to support statewide resource sharing are available, and more will emerge as new and evolving standards are adopted and implemented. Most Florida public libraries and public library systems and academic libraries are well positioned technically and technologically to participate in a statewide technology-based resource sharing initiative like the Florida Virtual Library.

Based on RMG's understandings of the library technology marketplace, on its work with the Division of Library and Information Services and the Florida Library Network Council, and on a survey of Florida libraries, RMG recommends:

- That Florida move forward immediately with implementation of the Florida Virtual Library, establishing funding for components defined, defining projects and processes for implementation, prioritizing and scheduling implementation of components, and developing policies and procedures associated with services that will be part of the Florida Virtual Library information environment;
- That the Web portal component be implemented first, since many of the content resources and the infrastructure and backbone are already in place;
- That Florida take advantage of the opportunity to build a standards-based statewide ILL system and make it a key part of the second wave of implementation;
- That policy and consensus-building efforts focus on statewide database licensing, statewide library borrower's card, and reciprocal borrowing mechanisms as critical to implementation of a viable statewide resource sharing system; and
- That development and definition of policies which will be critical to the success of the project -- policies for ILL, privacy, digital library projects, and patron authentication -- begin immediately.

EXECUTIVE SUMMARY: THE VISION FOR THE FLORIDA VIRTUAL LIBRARY

The Florida Virtual Library is a wide range of electronic information resources, digital content, and online information services organized in a coherent and cohesive manner that can be searched by Florida residents.

Access to the Florida Virtual Library is provided through an easy-to-use Web-based multilingual common user interface, and users can retrieve information from multiple sources by a single search.

The Florida Virtual Library complements the print resources in Florida library collections, and access to many print resources is provided to users through the Florida Virtual Library.

EXECUTIVE SUMMARY: FLORIDA VIRTUAL LIBRARY COMPONENTS

These critical components comprise the concept of the Florida Virtual Library:

- A Web-based portal whose public interface allows users to search for and retrieve information from a number of different resources, including library catalogs, licensed databases, state and local government agency sites, and local digital archives.
- Statewide licensing of commercially-provided online databases to allow all Florida residents to search for and retrieve information from licensed sites via the Web.
- The virtual union catalog of the digital bibliographic records which represent the holdings of Florida libraries.
- A centralized statewide interlibrary loan management system, which interoperates with the portal and union catalog and allows users to request materials associated with records retrieved from the union catalog and allows the electronic tracking of requests and materials.
- The virtual statewide borrower's card -- possible through the combined capabilities of the portal, the union catalog, and the ILL management system -- that provides for reciprocal borrowing and user privileges based on a user's relationship with a "home" Florida library.

EXECUTIVE SUMMARY: STRATEGIC GOALS

Statewide Licensed Databases

- Goal 1: Identify potential online database products of interest to greatest number of users statewide.
- Goal 2: Negotiate license(s) with one or more providers of online database products for access by all users statewide.

Portal

- Goal 1: Implement a portal product.
- Goal 2: Create uniform Web site and user interface.
- Goal 3: Determine content to be accessible/searchable via portal.

Virtual Union Catalog

- Goal 1: Implement the Virtual Union Catalog as a component of the FVL portal.
- Goal 2: Normalize target databases/online catalogs.

Interlibrary Loan

- Goal 1: Implement a standards-based ILL management system.
- Goal 2: Implement the ILL system to interoperate with the portal and virtual union catalog.
- Goal 3: Provide physical and electronic delivery of materials.
- Goal 4: Refine, promote, and enforce statewide ILL policies and procedures.
- Goal 5: Define concept of Virtual Borrower's card as function of the Virtual Union Catalog and statewide ILL system.

Local Digital Content

- Goal 1: Develop, promote, and support recommended standards for digital content creation and access to it.
- Goal 2: Identify and provide access to existing online digital resources of interest.
- Goal 3: Identify potential digital resources and prioritize possible digitization projects.

1 INTRODUCTION

The Florida Virtual Library is a concept based on the provision of access by Florida residents to a wide range of electronic information resources and digital content organized in a coherent and cohesive manner. Access to online digital information including library catalogs, licensed database products, state and local government resources and databases, educational resources, and locally-created community, archival, historical, and research resources would be provided through an easy-to-use Web-based common user interface that is available in multiple languages.

The vision for the Florida Virtual Library is:

The Florida Virtual Library is a wide range of electronic information resources, digital content, and online information services organized in a coherent and cohesive manner that can be searched by Florida residents. Access to the Florida Virtual Library is provided through an easy-to-use Web-based multilingual common user interface, and users can retrieve information from multiple sources by a single search. The Florida Virtual Library complements the print resources in Florida library collections, and access to many print resources are provided to users through the Florida Virtual Library.

The notion of a "virtual library" has evolved as more sophisticated technologies are incorporated to link people to sources of information in electronic form. The coalescence of technology and traditional library services has changed the way those services are provided, but not the underlying service need and motivation: to provide users with the best possible access to authoritative information resources.

A library is "virtual" in the sense that a number of different information resources can be brought to an end-user, rather than delivering the end-user to a physical set of resources. The World Wide Web has changed the environment for information delivery and for representation of information; the explosion of electronic information resources underscores the need for professionals to research, review, evaluate, and select authoritative sources to assist users seeking information.

These "traditional" library services are in greater demand today due to the sheer volume of online resources and number of users who are familiar and comfortable with online search environments; the virtual library does not replace traditional library services, but is another means to provide them.

Focus groups of library users and non-users and librarians throughout Florida have responded positively to the concept of the Florida Virtual Library, and have helped further refine and articulate the key components of the Florida Virtual Library. Those components include:

- A "portal," or gateway with a common user interface that provides access to a wide range of information in digital form and that also provides the capability to search specified online resources.
- Electronic content, including commercially-provided licensed full-text databases, state and local government information, and collections of Web resources and links to specialized Web sites.
- A statewide virtual union catalog of the holdings of all Florida libraries that can be searched through the portal.
- A statewide interlibrary loan system that allows users to request library materials from any Florida library and that provides for delivery of materials to users.
- A statewide virtual borrower's card that extends library privileges to all state residents through the capabilities of the portal and associated components.

There is no unified library technology planning in Florida today because of the different sources of funding for and the different organizational structures of the types of libraries in the state. The Florida Virtual Library is a unifying factor, allowing for top-level statewide planning and guidance in areas of key library technology implementation; it also provides the opportunity to develop a cohesive, coherent view of library services that emphasizes the strengths and special focus of each Florida library.

The capabilities envisioned for the Florida Virtual Library extend well beyond familiar Web search technology. The Florida Virtual Library is not another Web search engine or a set of disconnected links to other sites, and its resources are not limited to Web pages; it is the combined set of information resources, some unique to Florida, available to Florida residents in digital formats, some of which cannot be retrieved using standard Web search engines like Google, America Online, and Alta Vista. The Florida Virtual Library is intended to include a wide range of diverse resources where information is represented in multiple formats; the ability to search across multiple formats is a key capability of the Florida Virtual Library portal technology component, and provides another unifying element.

The Florida Virtual Library is based on work being done in Florida, the United States, and the world and on existing information technologies; it builds on a number of projects and services that exist in Florida, and extends the available services and information resources to all people of the state.

For example, two portal projects have been implemented in Florida using federal funds administered by the state, and there is at least one higher education implementation of a Web portal. These projects have demonstrated some of the potential of common access gateways to information resources.

Many Florida libraries subscribe to licensed database products, as members of groups or as individual institutions; licensing products of interest on behalf of a large number of libraries on a statewide basis would generate buying power, and allow libraries to use local funds for licensing of other more specialized products, creating a wider range of available electronic resources.

The holdings of many Florida libraries are represented in the online union catalog maintained by OCLC, the national bibliographic utility, and some libraries use OCLC for interlibrary loan. In addition, there is a large number of local and regional online catalogs throughout the state. There is, however, no single statewide union catalog.

These and other projects have created an awareness within Florida of the potential use of new technologies to deliver enhanced library services; that awareness has helped provide the

framework for the Florida Virtual Library. There is a very large installed library technology base in Florida, and millions of dollars have been invested in technology infrastructure, computer-based systems, and electronic and print resources; the Florida Virtual Library leverages that investment by building on the existing technology base and knowledge base.

The cost to implement the Florida Virtual Library represents a comparatively small incremental investment in the state's library technology that will enhance the overall value of the installed base and improve the ability of Florida libraries to deliver technology-based services through the combined resources of the Florida Virtual Library components.

The technology components of the Florida Virtual Library are described in further detail in Section 3 of this document, and the goals for implementation of the Florida Virtual Library are detailed in Section 2.

Table 1-1, which follows, provides budget estimates for implementation of the first three years of the Florida Virtual Library; Table 1-2 summarizes the recommended implementation schedule.

Cost estimates for technologies to provide the Florida Virtual Library portal, virtual union catalog (including content subscription), and ILL system are derived from industry cost data developed by RMG for other similar projects. Typical costs for the range of available suitable products have been extrapolated and scaled up, and generally include one-time and ongoing costs for hardware, software, and services provided by the product vendor, including training, installation, documentation, and support.

TABLE 1-1
ESTIMATED THREE-YEAR TECHNOLOGY BUDGET
FOR FLORIDA VIRTUAL LIBRARY

(1)	(2)	(3)
<u>Item</u>	<u>One-Time Costs (\$)</u>	<u>Annual Costs (\$)</u>
(1) Licensed Databases		5,000,000
(2) Web Portal/Gateway	1,000,000	120,000
(3) Virtual Union Catalog	(included in Line 2)	300,000
(4) Union Catalog Content Subscription		250,000
(5) ILL/Document Delivery	1,000,000	620,000
(6) Local Digital Content		300,000
(7) Training and Support		500,000
(8) Virtual Reference Support		250,000
(9) Project Administration		500,000
(10) Technology Support Staff		160,000
(11) Public Awareness/Project Implementation		500,000
(12) TOTAL OF ONE-TIME COSTS	2,000,000	
(13) TOTAL OF ANNUAL COSTS		8,500,000

TABLE 1-2**PROPOSED TIMEFRAME FOR FLORIDA VIRTUAL LIBRARY IMPLEMENTATION**

The timeframe allows for planning processes and procurement processes, and for implementation of key technology components of the Florida Virtual Library; dates for implementation are shown. The goal for the Florida Virtual Library is to begin planning in 2002, to conduct procurements beginning in the First Quarter of 2003, and to have initial components implemented by the end of 2003. The schedule can be adjusted at the completion of the state budget process and when levels of funding from other sources have been set.

Statewide Licensed Databases:	2003
Portal:	Third Quarter 2003
Virtual Union Catalog:	Fourth Quarter 2003
Virtual Reference:	Fourth Quarter 2003
Interlibrary Loan System:	2004
Local Digital Content:	2004

2 VISION AND GOALS FOR THE FLORIDA VIRTUAL LIBRARY

Based on the understandings of the Florida Virtual Library concept, on the review of statewide focus group feedback, and on review and discussion of the possible technologies and products that could be implemented to support the defined components of the Florida Virtual Library, the Planning Team has defined a set of strategic implementation goals.

Understandings and perceptions of the virtual library concept and possible supporting technologies are the basis for this vision of the Florida Virtual Library:

VISION STATEMENT

The Florida Virtual Library is a wide range of electronic information resources, digital content, and online information services organized in a coherent and cohesive manner that can be searched by Florida residents. Access to the Florida Virtual Library is provided through an easy-to-use Web-based multilingual common user interface, and users can retrieve information from multiple sources by a single search. The Florida Virtual Library complements the print resources in Florida library collections, and access to many print resources are provided to users through the Florida Virtual Library.

Table 2-1 presents a summary of implementation goals defined for each of the key components of the Florida Virtual Library as prioritized by the Planning Team; Tables 2-2 through 2-6 present objectives and strategies for the goals.

TABLE 2-1
IMPLEMENTATION GOALS FOR FLORIDA VIRTUAL LIBRARY

Statewide Database Licensing:

- Goal 1: Identify potential online database products of interest to greatest number of users statewide.
- Goal 2: Negotiate license(s) with one or more providers of online database products for access by all users statewide.

Portal:

- Goal 1: Implement a portal product.
- Goal 2: Create uniform Web site and user interface.
- Goal 3: Determine content to be accessible/searchable via portal.

Virtual Union Catalog:

- Goal 1: Implement the Virtual Union Catalog as a component of the FVL portal.
- Goal 2: Normalize target databases/online catalogs.

Interlibrary Loan:

- Goal 1: Implement a standards-based ILL management system.
- Goal 2: Implement the ILL system to interoperate with the portal and virtual union catalog.
- Goal 3: Provide physical and electronic delivery of materials.
- Goal 4: Develop, promote, and enforce statewide ILL policies and procedures.
- Goal 5: Define the concept of Virtual Borrower's card as a function of the Virtual Union Catalog and statewide ILL system.

Local Digital Content:

- Goal 1: Develop, promote, and support recommended standards for digital content creation and access to it.
- Goal 2: Identify and provide access to existing online digital resources of interest.
- Goal 3: Identify potential digital resources and prioritize possible digitization projects.

TABLE 2-2
IMPLEMENTATION GOALS FOR LICENSED DATABASE COMPONENT

GOAL 1: Identify potential online database products of interest to greatest number of users statewide.

OBJECTIVE 1: Conduct survey of Florida libraries to determine current online subscription levels (products, titles, pricing) and areas of interest, products of interest.

OBJECTIVE 2: Evaluate/assess available online products in context of current subscriptions, areas of interest, products of interest.

Strategy: Develop understandings of what licensed electronic resources are currently used by Florida libraries, how much libraries pay in aggregate to specific providers, and how many state residents have access to licensed content; define a statewide electronic resource selection process and create a Selection Team to evaluate and recommend products to be licensed on a statewide basis.

GOAL 2: Negotiate license(s) with one or more providers of online database products for access by all users statewide.

OBJECTIVE 1: Reduce or eliminate subscription prices for individual libraries.

OBJECTIVE 2: Extend subscriptions to libraries with no access to licensed content.

OBJECTIVE 3: Consolidate multiple individual license agreements into one or a few statewide agreements with vendors, if determined to be advantageous for Florida libraries.

Strategy: Leverage current individual/group expenditures for licensed resources with additional state monies to get the lowest possible prices on all products from providers doing business in Florida.

TIMEFRAME: Survey libraries and assess marketplace in 2002; identify vendors and products of interest, negotiate pricing in 2002; implement statewide licensing in 2003.

BUDGET: \$3 million to \$5 million per year ongoing costs.

**TABLE 2-3
IMPLEMENTATION GOALS FOR PORTAL COMPONENT**

GOAL 1: Implement a portal product.

OBJECTIVE 1: Identify and assess portal products; develop and refine functional, technical, and implementation requirements.

OBJECTIVE 2: Conduct formal procurement to evaluate and select portal product; negotiate agreement with provider, and implement.

Strategy: Create Evaluation Team to assess products and make recommendations; conduct process to create Request for Proposal or other document containing functional and technical requirements for portal, obtain and evaluate proposals from vendors, select product and vendor to provide portal. After selection of portal product, create Negotiating Team to negotiate configuration, cost, and implementation issues with selected vendor.

GOAL 2: Create uniform Web site and user interface.

OBJECTIVE 1: Select institution, company, or individuals to be responsible for design of FVL Web site and user interface

OBJECTIVE 2: Establish desirable design elements for FVL Web site and user interface.

OBJECTIVE 3: Evaluate, update, and re-design FVL Web site and user interface on regular basis.

Strategy: Contract with or establish Web design team to develop look and feel, design elements of FVL Web site and user interface, work with vendor of portal product to incorporate technical requirements/capabilities, continually update design, incorporate new resources and portal elements.

GOAL 3: Determine content to be accessible/searchable via portal.

OBJECTIVE 1: Investigate statewide licenses for subscription database products.

OBJECTIVE 2: Determine locations and characteristics of online catalogs of libraries, library systems to be searched as part of statewide virtual union catalog.

OBJECTIVE 3: Develop and/or subscribe to sets of Web sites providing authoritative research and information content.

OBJECTIVE 4: Coordinate with state and local government agencies, higher education agencies to provide searches of publicly-available Web content through the FVL portal.

Strategy: Provide as much content as possible that can be retrieved using a direct search at the FVL portal; establish teams to identify and designate authoritative Web sites; position FVL portal as authoritative search and retrieval site for public information.

TIMEFRAME: Evaluate products in 2002 and conduct procurement process in 2003; implement in Third or Fourth Quarter 2003, depending on source of funding and budget cycle.

BUDGET: \$500,000 to \$1,000,000 one-time costs, \$60,000 to \$120,000 per year ongoing costs.

TABLE 2-4
IMPLEMENTATION GOALS FOR VIRTUAL UNION CATALOG

GOAL 1: Implement the Virtual Union Catalog as a component of the FVL portal.

OBJECTIVE 1: Use capabilities for NISO Z39.50 search and retrieval or custom connectivity in portal product to establish broadcast search of potential target online bibliographic databases at Florida libraries.

OBJECTIVE 2: Provide access and user interface via the FVL portal.

Strategy: Maximize portal capabilities and simplify use by incorporating Z39.50 search into basic portal functionality.

GOAL 2: Normalize target databases/online catalogs.

OBJECTIVE 1: Encourage all libraries with target servers that are part of virtual union catalog to implement most current version of NISO Z39.50 protocol and support all attributes of the protocol.

OBJECTIVE 2: Encourage all libraries with target servers that are part of virtual union catalog to comply with emerging national standard model for Z39.50 implementation for indexing of bibliographic data and minimum level of attribute support.

Strategy: Create uniform search implementations of online bibliographic databases throughout the state; develop consensus on and common understandings of standards, practices, procedures.

TIMEFRAME: Implement in 2003.

BUDGET: For upgrade of local target servers and Z39.50 profile compliance: up to \$10,000 one-time cost per library; allocate up to \$300,000 per year total.

TABLE 2-5
IMPLEMENTATION GOALS FOR INTERLIBRARY LOAN AND DELIVERY
(Page 1 of 2)

GOAL 1: Implement a standards-based ILL management system.

OBJECTIVE 1: Conduct formal process to write requirements, receive proposals, and select vendor and product.

OBJECTIVE 2: Conduct negotiations with selected vendor.

Strategy: Create teams and conduct process similar to that described above for portal product identification and implementation.

GOAL 2: Implement the ILL system to interoperate with the portal and virtual union catalog.

OBJECTIVE 1: Provide user ILL functions (generate a request, determine request status, etc.) at the portal and virtual union catalog search level of the user interface.

OBJECTIVE 2: Provide the capability for bibliographic data elements from virtual union catalog search results to be captured and posted to ILL request forms.

Strategy: Make the ability to request a title as simple as possible in the portal/virtual union catalog user interface.

GOAL 3: Provide physical and electronic delivery of materials.

OBJECTIVE 1: Extend the DLLI Delivery Courier Service (or its successor) to all Florida libraries; tie the ILL system to DLLI delivery services, routes, and schedules.

OBJECTIVE 2: Provide electronic document delivery workstations (such as the Ariel workstation at some CCLA and FCLA libraries) to interested libraries.

OBJECTIVE 3: Investigate alternatives for direct delivery of ILL materials to users.

Strategy: Keep the current DLLI delivery pricing model, if possible.

GOAL 4: Refine, promote, and enforce statewide ILL policies and procedures.

OBJECTIVE 1: Form groups or committees of librarians and possibly users to develop policies for participation in and use of the statewide ILL management system.

OBJECTIVE 2: Continually assess and evaluate operating practices and procedures.

Strategy: Identify policies and procedures considered outstanding; adapt specific practices as appropriate.

TABLE 2-5
IMPLEMENTATION GOALS FOR INTERLIBRARY LOAN AND DELIVERY
(Page 2 of 2)

GOAL 5: Define concept of Virtual Borrower's card as function of the Virtual Union Catalog and statewide ILL system.

OBJECTIVE 1: Allow users to place requests on titles found in search of Virtual Union Catalog (requires Interlibrary Loan management component) or to borrow directly from an owning library.

OBJECTIVE 2: Implement NISO Circulation Interchange Protocol (NCIP, currently in draft form) at portal level and at local system levels for all Virtual Union Catalog target servers.

Strategy: Require users to be registered borrower at library that participates in Virtual Union Catalog (local online database is a target server); utilize NISO Circulation Interchange Protocol (NCIP, currently in draft form) as basis for determining home library, status of users requesting materials.

TIMEFRAME: Implement in 2003-2004.

BUDGET: For implementation of ILL product: \$500,000 to \$1,000,000 one-time costs, \$60,000 to \$120,000 per year ongoing costs. For purchase of NCIP software at local system level: up to \$25,000 one-time cost per library; allocate up to \$500,000 per year total.

**TABLE 2-6
IMPLEMENTATION GOALS FOR LOCAL DIGITAL CONTENT**

GOAL 1: Develop, promote, and support recommended standards for digital content creation and access to it.

OBJECTIVE 1: Set standards for data formats and metadata and descriptive record formats.

OBJECTIVE 2: Develop guidelines or minimum configuration requirements for hardware, software, and imaging systems to be used to create, store, and provide access to local digital content.

Strategy: Consider adapting the work being done by the FCLA PALMM Collections project, the Digital Library Forum of the Institute for Museum and Library Services, the California Digital Library, and the State of North Carolina.

GOAL 2: Identify and provide access to existing online digital resources of interest.

OBJECTIVE 1: Conduct a survey and inventory of online digitization projects in Florida.

OBJECTIVE 2: Determine content, characteristics, and formats of identified resources of interest; provide access to resources through FVL portal.

Strategy: If record data structures permit, provide capability to search content using the FVL portal search engine; otherwise, provide link from portal to content host site for "native" search.

GOAL 3: Identify potential digital resources and prioritize possible digitization projects.

OBJECTIVE 1: Conduct survey/inventory of resources in Florida that could be of interest if represented in digital format and available online.

OBJECTIVE 2: Define criteria and prioritize potential digitization projects for purposes of funding or seeking funding.

Strategy: Identify possible central site to host digital content and metadata records for those institutions and organizations with no existing computing or telecommunications infrastructure, and offer to host new digital content at low or no cost.

TIMEFRAME: Implement in 2004.

BUDGET: \$150,000 to \$300,000 per year could fund the one-time costs for 10 to 20 small projects at \$15,000 each, or a smaller number of larger projects depending on scale and scope of content to be digitized.

3 TECHNOLOGIES FOR THE FLORIDA VIRTUAL LIBRARY

The concept of the Florida Virtual Library is defined to include these major components:

- A Web-based portal whose public interface allows users to search for and retrieve information from a number of different resources, including library catalogs, licensed databases, state and local government agency sites, and local digital archives.
- Statewide licensing of commercially-provided online databases to allow all Florida residents to search for and retrieve information from licensed sites via the Web.
- The virtual union catalog of the digital bibliographic records which represent the holdings of Florida libraries.
- A centralized statewide interlibrary loan management system, which interoperates with the portal and union catalog and allows users to request materials associated with records retrieved from the union catalog and allows the electronic tracking of requests and materials.
- The virtual statewide borrower's card -- possible through the combined capabilities of the portal, the union catalog, and the ILL management system -- that provides for reciprocal borrowing and user privileges based on a user's relationship with a "home" Florida library.
- A means for authenticating users and authorizing user access to statewide resources, including licensed digital content.

These components are described in more detail in the following pages.

3.1 Web-based Portal

A centralized online gateway, or portal, would provide the unifying point of access to the variety of online electronic resources that are available through the Florida Virtual Library.

The portal will allow users to gain access to the suite of online electronic resources that are considered part of the statewide information environment. The portal will provide a coherent and unifying point of access to the variety of online electronic resources that are available through the Florida Virtual Library, including but not limited to the statewide union catalog, statewide ILL system, licensed databases, locally-created and/or locally-hosted databases, state and local government resources, and educational resources.

The gateway or portal system will also allow end-users to create persistent individualized or personalized versions of the user interface (the "my library" concept) that can be accessed and modified by users.

In addition to providing a common point of access, the portal would also function as a search engine, especially for resources in which access points are based on metadata formats such as Dublin Core or MPEG or on meta tags associated with HTML coding of Web sites.

The portal will be readily customizable using standard Web design and editing tools, and system and/or Web site administrators will be able to design, customize, and program the portal and related site content without vendor intervention.

The system would provide capabilities for support of multiple data formats and markup languages for purposes of site design, hosting locally-created and other databases, and content creation and description.

The distinction between the portal as a search engine and the portal as a set of links (universal resource locators, or URLs, to other Web sites) must be understood, and the appropriate solution sought. A metadata search engine is enabled to identify specific formats like Dublin Core as well as the methods for representing the metadata formats, such as XML (Extensible Mark-up Language).

As the portal concept evolves, it will also likely incorporate the notion of a link server, a means to manage and administer URLs associated with the portal; the evolving standard OpenURL includes requirements for a link server which negotiates privileges for access to content based on the URL of the resource and identification of the user.

Implementation of a portal would allow the Division of Library and Information Services to consolidate access to some of the resources available to libraries in the state, particularly subscription database products, and other licensed digital content.

The portal would also be a key element of and interoperate with the proposed statewide ILL system; portal users would be connected to the ILL system to request library materials associated with information retrieved from library catalogs as a result of searched conducted at the portal.

A portal like the one described here could significantly improve the Web presence of all Florida libraries and help create strong "brand identification" for the library services and digital content available to the people of the state through the Web.

As Florida libraries begin to develop local digital resources and archives specific to their communities, access through the portal will be important; the ability to search local digital content statewide through a single point will be very attractive. It is critical that standards for record format and for tagging and indexing of content on Web sites be adopted, while this initiative is still relatively new, to foster the most consistent search and retrieval of local information in digital form.

3.2 Union Catalog

The representation of the holdings of all Florida libraries, or those libraries willing and able to participate in a statewide resource sharing project, is referred to as the "union catalog" of holdings; for purposes of the project, the union catalog is considered to be an online catalog, a computer-based set of holdings records that are in machine-readable format, capable of being queried and accessed by users at computer workstations via user interfaces and search engine(s). The union catalog can be created in several ways: all records could be contained within one physical system database, the "physical union catalog;" or, records could be distributed across a number of different systems so that the total would equal the union catalog set, and users would query each system or subset of the union catalog.

The ability to conduct a single search against a number of different systems would make the query of multiple subsets less onerous; this capability is generally considered to be a function of a union catalog created by "linked systems," or the connection of a user to multiple systems for purposes of searching the union database by searching multiple databases either simultaneously or consecutively.

The physical union catalog approach is viewed as prohibitive for Florida libraries; most Florida libraries operate their own integrated library systems containing bibliographic records in individual catalogs, and since these records would be output from the local systems and used to create the initial union catalog, changes in local catalogs must be reflected in the union catalog. This requires constant updating of the union catalog by posting changes to records in local systems to the union catalog, not a trivial process, or by re-loading all local system catalog records periodically. There could be increased costs to individual libraries participating in a union catalog; for example, local systems vendors could charge for services and/or software for output of local systems records for union bibliographic database maintenance.

The statewide virtual union catalog would be created by linking all the various computer-based systems in which Florida libraries have loaded machine-readable records -- local integrated library systems (single-institution or shared) and regional catalogs (some vendor-hosted, some consortium-hosted, and all accessible via the Internet/Web).

These various systems could be linked by using a centralized search engine or gateway product to conduct broadcast searches via the Internet using the NISO Z39.50 search and retrieval protocol or other method.

The central Z39.50 gateway (that could be provided through the Florida Virtual Library portal) would provide a Web-browser based interface for end-users and HTTP links to identified servers for purposes of providing access to the online catalogs/bibliographic databases.

The Z39.50 search and retrieval protocol is well-established and has been used in many Linked Systems implementations to create virtual catalogs. However, not all ILS vendors have implemented all parts of the standard, and libraries do not all conform to the same parameters for index and display of their local system catalogs. For these reasons, retrieval using Z39.50 can be inconsistent and irregular.

In an effort to resolve this problem, an international standard model for Z39.50 implementation has been recently developed. The Bath Profile, and its U.S. counterpart, the National Profile (a superset of Bath) define rules for use of Z39.50 intended to achieve conformity by vendors in support of Z39.50 elements and by libraries in indexing of local catalogs for search and retrieval. It will likely be several years before all vendors comply with the National Profile in the U.S. and before the majority of U.S. libraries have compliant local system catalogs.

Another problem associated with use of Z39.50 is the number of potential target servers that can be queried during a search. The standard requires broadcast search capabilities (a single search, entered once, is sent to multiple target servers), and the Florida virtual union catalog could consist of hundreds of target servers. The time required to query a large number of servers, to obtain results from servers that respond, and to sort and/or format results for the end user depends on a number of factors, such as speed of network connection, number of results, number of servers, and so on; but generally the greater the number of target servers, the slower the response time and more complicated the process for sorting and displaying results for the end user.

The administration of a central gateway that targets hundreds of servers could also be a challenge; maintaining consistent network connections, network addresses, and local target configuration parameters and information would be a formidable exercise in logistics.

One approach to this problem is the establishment of differentiated groups of small numbers of target servers, by geography, type of library, or size of collection, and to limit searches, at least initially, to one grouping or cluster of target servers.

If a Virtual Union Catalog project were to be undertaken, libraries interested in participating with their local online system catalogs as target servers might be faced with system upgrade or purchase of additional software. Target servers will be required to have Z39.50 server software, to support the National Profile, and to support NCIP, the user authentication protocol. For libraries without these elements, there might be a cost from their system vendor to implement them.

If the Virtual Union Catalog solution is implemented, RMG recommends that the "enhanced catalog" services provided by system vendors -- the inclusion in a retrieved bibliographic record display of jacket art, table of contents, reviews, and other information provided on a subscription basis -- be part of the implementation, with \$250,000 per year budgeted for subscription services to the enhanced catalog content.

3.3 Interlibrary Loan/Document Delivery System

For the general public and most library users, access to a union catalog of library holdings implies the availability of materials represented in the catalog, and the ability to borrow or request individual items; an electronic interlibrary loan/document delivery (ILL) component is reasonably associated with a union catalog.

Systems or methods for conducting ILL would be based on access to and information about the holdings of libraries represented in the union catalog; it is reasonable to expect that some form of interface or interoperability between the union catalog and ILL method is required for ease of use and efficient operation. In addition, some form of interface or interoperability between the portal and the ILL method might be reasonably expected.

The Interlibrary Loan System should work in conjunction with the Virtual Union Catalog, and also interface with local integrated library systems for purposes of authentication/identification of users, obtaining item-level status information, as appropriate, and conducting circulation-related transactions, as appropriate.

Key capabilities include:

- User identification/authentication/authorization.
- Load-leveling of requests among target libraries, to level or equalize interlibrary loan/document delivery efforts and costs among participating libraries.
- Capabilities for renewals, recalls, and cancellation of filled or pending requests.
- Delivery mechanisms for electronic resources or materials in digital format.
- Patron-initiated requests and loans.
- Options for staff-mediated and non-mediated processing of requests.
- Management of transactions.
- Interfaces to local ILS circulation systems.

The acceptance by the U.S. library community of an international standard for ILL, ISO 10160/61, has resulted in the past several years in the development of standards-based ILL systems for managing, transmitting, and processing ILL requests electronically. A number of ILS vendors are also developing or have completed development of standards-compliant ILL modules that will be offered as part of their suite of system software.

There is no widespread implementation of standards-based ILL systems in the U.S. today and no proof of interoperability; as system installations increase, the ability to conduct ILL transactions across system boundaries will be tested and demonstrated. As more ILS vendors offer ILL capabilities, more libraries will install and implement ILL systems.

The opportunity to implement standards-based statewide ILL in Florida is attractive; a top-down planning and implementation project could provide a coherent system for use by all libraries in the state, and very few, if any, systems would have to be replaced. The OCLC ILL system is the ILL system most commonly used by Florida libraries, but because of pricing and other issues, not all Florida libraries participate in OCLC, nor are they likely to. A statewide ILL system would not replace OCLC, but create a set of specific Florida libraries whose holdings would be searched as a step prior to use of the OCLC system. Any statewide ILL system will be expected to be compatible with and interoperate with the OCLC ILL system.

Before many libraries opt to implement their own ILL systems, the implementation of a statewide ILL system could create a single method for conducting ILL in Florida. If there is no statewide system, within a few years, there will be many systems, requiring interoperability and creating a potential new problem like Z39.50, different versions and different implementations making communication and coordination difficult.

An ILL system could be provided by the vendor of the union catalog solution selected for the state, or could be provided by another vendor; the selection of a union catalog vendor does not dictate that the same vendor provide the ILL solution.

The key will be the ability of the ILL system to work with the union catalog system; the technical requirements are not complex, and a standards-based ILL system should be compatible with any union catalog solution that can retrieve a MARC bibliographic record as a result of a search.

Implicit in ILL is the ability to deliver materials to users; physical delivery of materials could be accommodated using existing delivery mechanisms in the state. Electronic delivery of materials should be investigated, especially for materials that could benefit from conversion to digital format or that exist in digital format already.

A statewide ILL system will require statewide policies and procedures for ILL; RMG recommends that planning and development of those policies and procedures begin right away.

3.4 User Authentication

Although not technically a separate technology component, the authentication of users for access to resources and services and other privileges that would be part of the Florida Virtual Library environment will be required.

Presently, users are authenticated for access to the subscription databases and digital resources. Authentication methods vary, and range from use of proprietary tools and formats to use of Internet protocol (IP) address capture to user log-in with identification and password.

A library technology standard for user authentication is currently being finalized; the NISO Circulation Interchange Protocol (NCIP) is a potential common tool for user authentication, and a large number of vendors of library technologies and information industry products are poised to implement the standard as soon as it becomes formalized. This could occur before the end of 2002, but likely will require at least a year for widespread implementation.

Nevertheless, adoption of NCIP will provide a consistent method for user authentication that could be utilized with at least the portal and ILL components of the statewide resource sharing technologies.

Other protocols and technologies from outside the library industry that could influence future direction and standards for library technologies and services include the Lightweight Directory Access Protocol (LDAP), a protocol for accessing online directory services that is based on the ISO X.500 Directory Access Protocol, and the OpenURL standard now being developed within the National Information Standards Organization (NISO). This standard will allow a given end-user to be connected to the appropriate copy of any chosen resource by passing along bibliographic or descriptive information about the resource in the form of metadata and taking into account the user's organizational context or starting point.

Another consideration regarding authentication will be the implementation of the proposed statewide borrower's card that would in effect be based on a statewide reciprocal borrowing policy and program. The concept of a statewide borrower's card must be incorporated into and be compatible with statewide resource sharing technologies and authentication mechanisms.

RMG recommends that policies regarding user authentication, including privacy statements, be developed prior to implementation of NCIP in any technology or product in the statewide information environment.

3.5 Virtual Reference

Another service that could be provided as part of the Florida Virtual Library through the portal is Virtual Reference, a collaborative technology that allows users to interact with librarians via the Web. There are a number of products that provide tools for this new and evolving service, and there is at least one implementation of one of the products in Florida. Existing products typically allow interactive Web sessions in which a library staff member can direct a user to specific Web sites or can push designated digital content to the user; the library staff client is able to control the user's session, and the library staff member sees the same screen display as the user.

Virtual Reference is not intended to replace local library reference services, but to expand service by reaching more users, providing more efficient and directed use of human and information resources, and allowing more diversification and less overlap of existing reference resources.

A statewide Virtual Reference implementation could allow users to receive reference assistance outside of normal operating hours; it could also direct users to specialized resources and to librarians with specialized knowledge and information. Policies regarding participation, resource allocation, scheduling, and scope of service must be defined; RMG recommends that \$250,000 per year be budgeted for Virtual Reference to expand the service and to provide support for libraries implementing the service.

4 IMPLEMENTATION OF THE FLORIDA VIRTUAL LIBRARY

The next activities aimed at realization of the Florida Virtual Library will be the definition and conduct of planning and procurement processes for the technology components of the Florida Virtual Library and associated services. Structures for high-level administration and oversight of these processes must be provided, and groups of people must be organized to carry out specific tasks defined for the processes.

4.1 Organization and Administration

The various components of the Florida Virtual Library, once implemented, will be highly interdependent, and should be viewed as complex system requiring ongoing efforts of review, planning, enhancement, and assessment. Representatives of Florida libraries should be involved in these efforts, and there should be a single administrative focus for the organization of the human resources required and for the coordination of the various projects that will result in implementation of the Florida Virtual Library.

The Florida Library Network Council is one administrative body that could be given responsibility for defining projects and establishing the groups to be charged with specific tasks related to implementation, and for providing oversight of projects and of the Florida Virtual Library itself. RMG recommends that the Network Council consider this role, or identify other potential administrators. The Division of Library and Information Services should be a significant partner and advisor to the Network Council, and offer its resources to assist in all activities associated with implementation and ongoing operation of the Florida Virtual Library.

The need for centralized planning cannot be overstated; the state's higher education institutions and their libraries have benefited from centralized technology planning, but there has been no similar effort for the state's public libraries. The creation of the Florida Virtual Library provides an opportunity for statewide centralized technology planning for libraries of all types; RMG notes that technology planning has come to focus today more on roles of guidance, facilitation, and consulting rather than of technology purchase and management.

The working groups to be established will be required to address four broad areas of activity:

- The tactical planning of each component of the Florida Virtual Library, intended to address project definition and scope, timeframe, and specific tasks to be carried out.

- Definition and conduct of procurements for some components of the Florida Virtual Library, which should include the development of statements of functional, technical, and implementation requirements to be included in Request for Proposal or other procurement documents, the identification and evaluation of suitable products and vendors' written proposals, the selection of products, and the negotiation of purchase and maintenance/support agreements for the selected products.
- Implementation planning and implementation of selected products and of other components of the Florida Virtual Library.
- Adoption, enforcement, and review of technology-related standards for components of the Florida Virtual Library and the statewide infrastructure that supports it.
- Development, review, and revision of policies associated with use of and access to the Florida Virtual Library.

Some groups may be considered permanent or standing, and others may be temporary, with specific charges to be carried out within specific timeframes; RMG recommends that the organization required for administration and implementation of the Florida Virtual Library be designed immediately and that planning groups for the initial components begin work as soon as possible.

4.2 Staff

In addition to the governing body charged with oversight of the Florida Virtual Library, full-time managers will be required in key areas.

A Project Administrator will be responsible for the day-to-day functioning of the Florida Virtual Library, including coordination of operation of technology components, communication with vendors, communication with the state's libraries, residents, and other stakeholders, and scheduling and facilitation of meetings of permanent and temporary working groups. The Project Administrator will provide the coherent overview of all components of the Florida Virtual Library.

Training will be managed by a Training Coordinator, who may also be expected to provide some training services. Training materials, including Web-based materials, must be designed

and maintained, and training sessions must be developed; trainers must be recruited and trained, or training organizations identified and contracted with. The Training Coordinator will manage the training budget.

All components of the Florida Virtual Library will require support of the underlying technologies or services, and the tight interrelationship and interdependency of the components will create a complex support environment. A Support Coordinator will oversee all support activities and support providers, and will manage maintenance and support contracts and budgets.

These three positions can be considered the project administration team, and should be co-located; RMG recommends that project administration be funded at \$500,000 annually, including salaries, office space and furnishings, and operating.

Several of the technology components of the Florida Virtual Library will require additional human resources for support beyond that provided by the vendor of the product chosen for each component. The products selected for implementation of the portal, virtual union catalog, and ILL system component of the Florida Virtual Library will require operation support regardless of where hosted (even if outsourced to the product vendors); staff will be required to oversee the day-to-day operation of the components, to communicate with the Project Administration team regarding implementation, support, and training activities, to interact with users, and to communicate with support providers.

RMG estimates that two full-time staff, working together, will be required during the first three years of implementation, and recommends a budget of \$160,000 per year (\$60,000 salary plus 33 per cent benefits).

A key factor regarding support will be the perceived need for some form of Help Desk or other interactive assistance for users. Until specific products are selected and implemented, the level of required assistance will not be known, and the resource cannot be planned. The costs to create and operate a Help Desk organization could be high; contracting the service to an organization that operates an existing Help Desk could be less expensive, but the applications software used in the Florida Virtual Library components might be too specialized for such an organization.

4.3 Training

Training is expected to be provided on some components at the local library building level, while some training might be done on a regional basis, and some training might be delivered via

the Web. As the Florida Virtual Library is intended to be dynamic and new features and services will be continually added, training will be required on an ongoing basis. Training will involve detailed functional training for library staff for some components and higher-level orientation of staff and users for some components. There will be a full-time Training Coordinator to overall all training activities, and trainers will be developed; organizations which provide training services could be contracted, and a cadre of trainers within the state, from libraries and from other institutions, should be developed and trained, with compensation provided.

RMG recommends that training activities, including the development of a training program and specific training for components of the Florida Virtual Library, be budgeted at \$500,000 per year.

4.4 Hosting

Some of the technology components of the Florida Virtual Library are based on computer hardware and software that must be located in physical spaces with connection to the Internet and Web. These host sites could be within the state, or could be remote, provided by the vendors of the component products or by an organization which provides hosting services.

If any of the components are to be hosted in Florida, RMG recommends that organizations and institutions with existing library technology operations be considered as host sites; since access to information is the main theme of the Florida Virtual Library, the focus should be on experience in library technology and information management, and not on computer hardware management. It is not necessary to concentrate the physical computer resources in one space, since all components are based on Web access and Web utilities; but if the intellectual resources to plan and manage library information technology are concentrated in an organization, that organization is a logical hosting candidate.

In addition to technology hosts, institutional hosts for the Project Administration team and technology support staff must be identified. It will not be necessary for the Project Administration team to be physically close to the technology components, but the technology support staff must be.

4.5 Public Awareness/Project Implementation

As the Florida Virtual Library begins to take shape and key elements and services are readied for implementation, there will be a need for design and development of tools to promote the

concept. As a Web-based resource, the Florida Virtual Library must have a high-profile presence on the Web, and the design elements for the portal and associated Web pages must be professional in appearance and reflect the vision for the Florida Virtual Library.

RMG recommends that a professional Web designer be responsible for creation of the look and feel of the portal and Florida Virtual Library Web site, and that the design be continually reviewed and revised to incorporate new design elements, new technologies, and new services and content.

As the Florida Virtual Library is implemented, an aggressive public awareness campaign should be mounted, one that uses traditional publicity channels but that also has a strong Web-based approach.

RMG recommends that a budget for Web design and for public awareness be linked to implementation of the Florida Virtual Library components, and that \$500,000 per year be allocated.

4.6 Timing

Some technology components of the Florida Virtual Library will be implemented on a demonstration or prototype basis, and scaled up over time based on implementation findings and level of interest in participation, particularly for services like Virtual Reference and Local Digital Content, where libraries opt to participate. Funding, therefore, may have to be adjusted from year to year depending on these outcomes.

Some components might be tested extensively before being put into production for real-time access and use; the goal for each component should be that it be stabilized and put into production as quickly as possible. If the complete suite of proposed components of the Florida Virtual Library is online and available within a short time (one to two years), planning for enhanced services and new technologies can begin within one year.

The components of the Florida Virtual Library given the highest priority for implementation are statewide licensed databases and the portal. As a result of timing and funding availability, it is possible that a statewide database project could result in the licensing of one or more products before the portal component is ready. In that case, a "temporary" portal, a Web site without the search engine capability, could be established where users would be directed to the vendor site of the licensed database products for connection and search. When the portal component is implemented, the search capability and other portal functions would be

overlaid on the temporary site; the Web site address would remain the same, and users would not be required to deal with new look-and-feel and address issues.