

# Transitioning from Knowledge Management to Portals: *Creating Customized Data Delivery for End-Users*



Rebecca H. Augustyniak,  
Dawn B. Aguero, and Amy M. Finley  
Clearinghouse for Applied Research and Public Service  
Florida State University

**cites** Center for Information, Training,  
and Evaluation Services  
Florida State University

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## **OVERVIEW**

Upon successful development and implementation of Florida ExpertNet—a Knowledge Management system (KMS) that connects business/industry and the public sector with thousands of individual faculty members with proven expertise—our focus quickly turned to how we could better meet the needs of the end-user. The system had been successfully populated with meaningful data, but there was no easy mechanism for the end-user to mine it. There was also no way for the end-user to customize the system to specifically meet his or her needs. Based on the use of Web portals to help mine data and customize information delivery to the end-user, a Web portal seemed to be the logical solution.

This paper will discuss planning the intellectual and technical processes of transitioning a KMS such as Florida ExpertNet ([expertnet.org](http://expertnet.org)) to the next generation in customized information delivery—the Web portal.

## **WHY TRANSITION TO A PORTAL?**

The Clearinghouse for Applied Research and Public Service (Clearinghouse) established Florida ExpertNet in 1998, a Web-based KMS that provides a searchable network for users to access experts in hundreds of centers and institutes and to thousands of individual faculty members with proven expertise within the State University System (SUS) of Florida.

In the 2001 article “Using a Knowledge Management System to Herd Cats: Florida ExpertNet,” the reader is introduced to Florida ExpertNet and the design and development steps taken to develop it as a KMS. The article described how the Clearinghouse was given the challenging task of developing a system that would capture the applied research expertise contained within the 11 universities that make up the SUS (over 6,000 principal investigators, 60,000 funded projects, and approximately 500 centers and institutes). The logical approach to this task was to develop a KMS that

would allow individuals to access a unified system where they could participate in a meaningful way.

In 1998, the Clearinghouse was on the leading edge in developing a fully interactive KMS that utilized the full power of the Web. However, due to changes in technology, the Florida ExpertNet system can currently be characterized as a legacy system. The move to a more robust technical infrastructure made the opportunity to transition to the Web portal possible.

A Web portal can be defined as a Web site that provides the ability to use a secure username/password and to customize the content based on specific interests and needs. Transitioning to a portal would provide the ability to consolidate, integrate, enhance, and connect end-users to a single gateway of customized, personalized information. A portal would also provide the ability to incorporate external data from outside of the KMS to provide for the most comprehensive access possible to needed data.

## **IS KM ON THE WAY OUT?**

There are many references in professional literature that proclaim that KM is a failure or on its way out. To the contrary, Florida ExpertNet has been a huge success as a KMS. In fact, its success in collecting and organizing a multitude of rich data that describes expertise in Florida's universities forced the Clearinghouse into developing a better solution to mine and deliver the data in a more meaningful and personalized way.

It is important to understand that a portal does not replace a KMS but instead is a tool that interacts with it to serve data based on the specifications of the end-user. As stated so succinctly by Cloete and Snyman (2003) "through clever software vendor marketing, companies might be misled to think that implementing a portal is equal to implementing KM" (p. 236).

According to Cloete and Snyman, "The portal is the interface, the place where information exchange and knowledge transfer takes place, but it is only one component of successful KM (p. 237)." The portal is the tool that links the various silos of KM (internally and externally) in a meaningful way into one unified source. This facilitates policymaking and decision making and the development and acquisition of knowledge on specific issues and topics. In order for the portal to be successful, the foundation must be a comprehensive KMS.

## **FLORIDA EXPERTNET —SUCCESSSES AND LIMITATIONS**

Prior to the development of Florida ExpertNet, an individual who was looking for specific expertise within the SUS would have to go to each university's Web site. No single interface existed that would provide the end-user with a comprehensive overview of available expertise within Florida's universities. Florida ExpertNet was the solution to this problem. As a KMS, it has been successful in getting organization members (university principal investigators and centers/institutes directors) to participate, by

populating their records with information about their expertise, and by using a controlled research descriptor taxonomy to classify their areas of expertise.

Although successful as a KMS, Florida ExpertNet does have limitations. The limitations of the current system are as follows:

- Lack of customization
- Narrow scope
- Absence of collaboration/communication tools
- Absence of research and planning tools

The objective in creating a portal is to provide a seamless view of the Florida university research environment, which logically presents information by interest groups with enhanced delivery. Every registered user should be able to access and organize a broad range of customized information, collaboration, communication, planning, and research tools. Additional information will be provided in a more meaningful way.

For example, there are various sources of information about research expertise in Florida's universities that are currently not published on the Florida ExpertNet Web site. Some of these sources include the Media Relations and Sponsored Research Offices at each university. These content providers publish and disseminate research information on a daily basis that is not currently captured in Florida ExpertNet. Registered users will be able to receive pertinent updates from these providers based on content-filtering preferences.

The following sections describe in detail the portal definition and design process and how it will enhance Florida ExpertNet's successes and provide solutions to its limitations. The design and planning process includes defining the following key components of a portal:

- Portal vision
- Administrative processes
- Administrative and user roles
- Content management
- Technical administration and requirements
- Security plan
- Creative prototype

## **PORTAL VISION**

The Florida ExpertNet Research Portal (Research Portal) will provide an interface where the public and private sectors in Florida and throughout the world can gain access to information about Florida's university-based research in one central place. It will be a customized and personalized entrée to useful research information and resources available throughout the state of Florida.

The Research Portal will transform how end-users access valuable information about Florida's university-based researchers and their activities across disciplines. For

example, from any Internet-connected device, registered users will be able to access information about research and expertise within Florida's universities, based on filters they have selected (i.e., subject areas, universities). This provides access to tools such as calendars, links, publications, federated search engines, etc., that allow the user to create and organize their research information. Visitors (or guest users) will have access to unfiltered information spanning all the universities in Florida.

The Research Portal will enable every university office of Media Relations, Technology Transfer, and Sponsored Research to be integrated into the Research Portal, thereby creating a unified foundation for distributing information regarding diverse initiatives to thousands of potential users.

## **Needs**

One of the first steps in the design process is to determine the needs of the target audience. A plan was developed to create virtual advisory boards consisting of members within the public and private sectors to participate in focus group sessions, Web-based surveys, and ongoing feedback. Before meeting with the virtual advisory boards, a functional capability list and portal-needs matrix was created to assess critical needs for Research Portal success. The following is the functional capability list:

- Customizable—All end-users must be able to customize their view into the portal and have it be retained for future reference.
- Standard Profiles (Views)—Standard profiles must be established to guide the end-user in setting up his or her custom view.
- ADA Compliant—Portal must adhere to Section 508 of the Rehabilitation Act (29 U.S.C. 794d), as amended by the Workforce Investment Act of 1998 (P.L. 105-220), August 7, 1998.
- Security Profiles—Security profiles of each end-user must be maintained by the portal.
- Search Capability—Portal must have a robust search engine to locate portal sections by multiple paths, including topic, category, direct link, service, function, etc.
- Interoperability—Portal must be scalable to support the linking and data transport of formatted application information.
- Messaging—Portal must support messaging services between sites, individuals, and applications.
- Calendar—Portal must support a calendaring function viewable globally and by category, group, and interest.
- Research Tools—Portal must support productivity tools including, but not limited to, federated search engine, Research Clipboard, Ask a Librarian, Ask an Expert, and Collaborate with Experts.
- Survey Development/Deployment/Results Application—Portal must be capable of presenting survey questionnaires to the customer community, in whole or by category, collecting the results and exporting a file in a predefined format.

## Portal Needs Matrix

The following table illustrates the Research Portal categories and subcategories for content/applications that were established as critical for the success of the Research Portal.

| Functional Categories       | Subcategories   |
|-----------------------------|---|
| General                     |   |
|                             | Help  |
|                             | System Announcements  |
|                             | Feedback  |
| Research Tools              |   |
|                             | Federated Search Engine   |
|                             | Locate Expertise (experts, speakers, proposals, centers/institutes, news) |
|                             | Links to External Sites (patents, associations, cities, etc.)             |
|                             | Publications  |
|                             | Clipboard   |
|                             | My Folders (publications, contacts, organizations)                        |
|                             | Search Portal (keyword, advanced)   |
|                             | Saved Portal Searches   |
|                             | Survey Development/Deployment/Results                                     |
|                             | Ask an Expert   |
|                             | Ask a Librarian   |
| Collaboration/Communication |   |
|                             | E-Forums  |
|                             | Web Meetings  |
|                             | Blogs   |
|                             | Chat  |
|                             | Briefcase   |
| Planning Tools              |   |
|                             | Calendar  |
|                             | Tasks   |
| Profile                     |   |
|                             | User Profile  |
|                             | User Preferences  |

| Functional Categories  | Subcategories                        |
|------------------------|--------------------------------------|
| Portal Administration  |                                      |
|                        | Management Tools                     |
|                        | Security                             |
| Content Administration |                                      |
|                        | Edit Expert/Project Record           |
|                        | Add/Edit Speaker Presentation Record |
|                        | Edit Center/Institute                |
|                        | Add/Edit Targeted Content            |

Understanding the needs of the end-users is paramount to the success of the portal. By creating virtual communities of end-users by various categories, the Clearinghouse will have quick and easy access to ongoing feedback in defining needs for using and accessing the Research Portal. Also, Web-based assessment in real time will be an ongoing and integral part of the Research Portal.

### **Benefits**

The following were identified as key benefits of the Research Portal:

- Regardless of resources, each university can establish its own portal through the Research Portal
- Shared applications, thus eliminating redundancy of resource development
- Real-time information for users
- Elimination of institution silos, thus creating a seamless interface for users
- Single sign-on to all applications

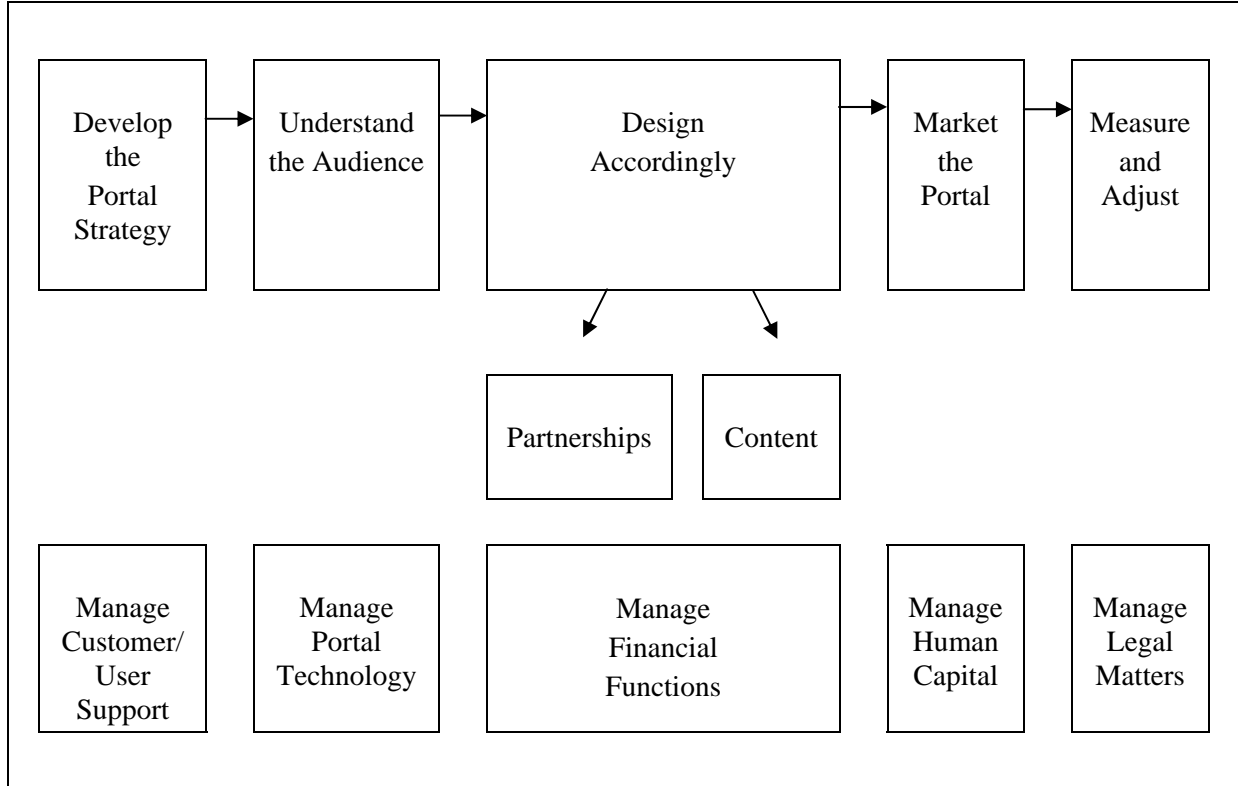
### **Sponsorship**

Getting executive sponsorship to reinforce the Research Portal as the one portal is critical to its success. The Florida Department of Education, Division of Colleges and Universities (DCU), has given its support as the executive sponsor of the site and assured their support in promoting the site as the one portal of its kind that is supported by their department.

## **ADMINISTRATIVE PROCESSES**

A number of processes must take place within the management framework in order to ensure a viable, ongoing, successful portal. Following are the processes to consider:

## Management Framework



### Develop the Portal Strategy

**Consider the organizational strategy, then develop the portal strategy.**

- Focus on the internal and external organizational strategy and any environments the portal will operate within.
- 

### Understand the Audience

**Consider the organization/culture/market of the stakeholders/target audience.**

- Focus on portal stakeholders' needs and user habits; monitor portal usage, response, and feedback; and improve the portal accordingly.
- 

### Design Accordingly

**Design the portal to provide tools and content to meet the stakeholders'/target audience's needs.**

- Focus on stakeholders' needs and match them with appropriate tools and content; identify, approach, and create agreements with appropriate content providers; and determine and measure success based on specified criteria. Develop action plans to maintain successful participation and operation of the portal.



**Partnerships. Form and manage partnerships.**

- Focus on activities between the portal and the content providers. Include evaluation of identified partners, negotiations with partner related to roles and responsibilities, partners' scope of work, and integration of the partners' content into the portal. Maintain ongoing relationship with the partners, including success measurements and progress reports.

**Content. Create, integrate, and manage content.**

- Focus on activities to integrate internal and partner-provided content. Include identification of content (sources and tools), authoring standards and guidelines, indexing rules and sources, publishing schedules, approval, and editing. Determine process order and flow, and how to handle any exceptions.
- 

**Market the Portal**

**Create branding and market the portal to generate awareness and engage users.**

- Focus on activities to market the portal to potential users and stakeholders. Include creation of a branding strategy, promotional activities to generate awareness, identification of opportunities for co-branding with partners, and development of customer support strategy.
- 

**Measure and Adjust**

**Measure all aspects of operation and functions and adjust processes, as needed.**

- Determine measurement criteria for all aspects of portal functions and processes. Include identification of key performance indicators, evaluation of effectiveness of promotional activities and efforts, create improvement plans, and review results on a regular basis.
- 

**Manage Customer/User Support**

**Create and maintain customer support functions and processes.**

- Focus on all aspects of serving/servicing portal users. Include development of help desk (phone and e-mail), triage and routing of requests, response mechanisms (auto-replies, standard service times, etc.), and creation of user FAQs.
- 

**Manage Portal Technology**

**Create and maintain portal information technology structure and infrastructure.**

- Focus on all aspects of technology related to design and development, maintenance, and upgrades of the portal.
-

## **Manage Financial Functions**

### **Manage any portal-related fiscal matters.**

- Focus on organization and ongoing management of all financial matters related to the portal. Include design, development, payroll, partner contracts that include financial aspects, and eCommerce applications, software/hardware initial layouts, and upgrades.
- 

## **Manage Human Capital**

### **Manage all human resources related to the portal.**

- Focus on organization and management of individuals and groups involved in portal-related activities. Include hiring, training and development, formal and informal feedback processes, and efficient use of resources.
- 

## **Manage Legal Matters**

### **Manage all portal-related legal matters.**

- Focus on partnership agreements, privacy policies, copyright, access agreements, any eCommerce agreements.

## **ADMINISTRATIVE AND USER ROLES**

When developing a portal, it is critical to identify and define the roles that will be needed for successful design, implementation, and operation. The Research Portal community will be composed of portal administrators, content provider administrators, and portal end-users. Research Portal administrators are the Clearinghouse professionals. Content provider administrators are the staff from Sponsored Research, Technology Transfer, and Media Relations Offices from Florida's universities who agree to provide information and data for the Research Portal, as well as other partners. Research Portal end-users are individuals who will come to the Research Portal to find expertise, to collaborate, and to explore.

The roles are listed in the following tables. Inclusion of these roles will provide successful creation, implementation, and ongoing management of the Research Portal. Roles are not necessarily mutually exclusive. Some roles may be combined. Also, some roles may need to be filled by more than one person.

## Portal Administrators (Potential Roles)

| Role              | Position Description  | Responsibilities   |
|-------------------|---|--|
| Portal Director   | Directs, leads, and facilitates the project. Responsible for continued oversight of the project, including strategic and tactical leadership.                           | <ul style="list-style-type: none"> <li>• Creates awareness of and enthusiasm for the portal to the general public and to specific key stakeholders</li> <li>• Initiates partnerships with content providers and portal partners</li> <li>• Maintains ongoing relationships with content providers and partners</li> <li>• Develops and creates success measurement standards</li> <li>• Seeks and creates ways to improve and enhance the portal, based on user feedback and other input</li> <li>• Guides portal development processes, adjusting goals, as needed</li> </ul> |
| Portal Developer  | Oversees all technical matters related to the portal.   | <ul style="list-style-type: none"> <li>• Responsible for configuration and overall operation of the portal</li> <li>• Maintains, troubleshoots, provides disaster recovery functions, etc.</li> <li>• Enhances the portal, as appropriate</li> </ul>   |
| Marketing Manager | Spearheads all marketing and branding related to the portal and is integral in maintaining and improving visual design standards.                                       | <ul style="list-style-type: none"> <li>• Develops the marketing strategy for the portal</li> <li>• Markets the portal to specified audience groups</li> <li>• Coordinates marketing efforts to maximize effectiveness</li> <li>• Creates and ensures branding continuity for portal and related marketing tools</li> <li>• Partners with content providers to ensure continuity in co-branding</li> </ul>  |
| Content Developer | Ensures and maintains up-to-date, high quality content and is responsible for development and related technical and standardization matters of specific portal content. | <ul style="list-style-type: none"> <li>• Reviews content for appropriateness</li> <li>• Searches and procures new and timely content themes and topics for various portal audiences</li> <li>• Mines and selects appropriate topical data, etc.</li> <li>• Revises and reformats data, according to standardization guidelines, as needed</li> </ul>   |
| Support           | Is the initial support contact for content providers and end-users, the “help desk.”  | <ul style="list-style-type: none"> <li>• Responds to end-user and content provider questions</li> <li>• First contact for technical and operational questions; performs triage and routing of questions, as needed</li> </ul>  |

| <b>Role</b>                   | <b>Position Description</b>  | <b>Responsibilities</b>   |
|-------------------------------|--|---|
| Tool Developer                | Responsible for development and related technical matters of a specific tool.                                | <ul style="list-style-type: none"> <li>• Designs and creates the tool</li> <li>• Develops and configures tool to appropriate specifications</li> <li>• Maintains, troubleshoots, provides disaster recovery functions, etc.</li> <li>• Enhances the tool, as appropriate</li> </ul> |
| Content Coordinator           | Ensures content updating procedures are in place. Ensures continuity in content themes for the portal.       | <ul style="list-style-type: none"> <li>• Schedules and verifies content updates</li> <li>• Schedules and verifies content themes</li> </ul>   |
| Quality Assurance Coordinator | Reviews and maintains standardization guidelines of the content. Reviews and maintains system functionality. | <ul style="list-style-type: none"> <li>• Reviews content that will be part of the portal for adherence to standardization guidelines</li> <li>• Reviews functionality of appropriate tools to ensure that data is accessible</li> </ul>   |

### **Partners/Content Providers (Potential Roles)**

| <b>Role</b>               | <b>Description</b>   | <b>Primary Responsibilities</b>   |
|---------------------------|--|---|
| Content Provider Director | Directs, leads, and facilitates. Responsible for continued oversight of the partnership with the Research Portal, including strategic and tactical leadership. | <ul style="list-style-type: none"> <li>• Develops and creates participation agreement with the Portal Director</li> <li>• Develops and creates success measurement standards with the Portal Director</li> <li>• Assesses portal/portal participation success based on predetermined standards</li> <li>• Maintains relationship with the portal</li> <li>• Provides feedback on ways to improve the portal</li> <li>• Ensures that content is being provided in an appropriate and timely manner, by content provider's staff members</li> </ul> |
| Editor                    | Ensures quality content and tools are provided in order to meet the needs of the portal audiences.   | <ul style="list-style-type: none"> <li>• Verifies that data is complete, appropriate, properly formatted, and high quality</li> <li>• Verifies that content is updated in a timely manner</li> </ul>  |
| Author                    | Creates content for the portal.  | <ul style="list-style-type: none"> <li>• Creates content for usage in one or more portal tools</li> <li>• Adheres to content guidelines</li> </ul>  |

| <b>Role</b>       | <b>Description</b>   | <b>Primary Responsibilities</b>   |
|-------------------|--|---|
| Quality Assurance | Reviews and maintains functionality of content tools. Reviews and maintains standardization guidelines of the content. | <ul style="list-style-type: none"> <li>• Reviews content that will be part of the portal for adherence to standardization guidelines</li> <li>• Reviews functionality of appropriate tools to ensure that data is accessible</li> </ul> |

### **Portal End-User Potential Roles**

End-users may have more than one role. For example, a Registered User may also be an Expert, an advisory board member, and a community leader. Different user tools and functions may be available to different roles. Any user who has multiple roles will have access to all of the appropriate functions and tools for all of the applicable roles.

| <b>Role</b>                     | <b>Description</b>   | <b>Responsibilities</b>   |
|---------------------------------|--|---|
| Guest User                      | Any user who visits the public portal page, but who has not registered in order to personalize the portal          | <ul style="list-style-type: none"> <li>• Browses</li> <li>• Searches using publicly available tools</li> </ul>  |
| Registered User                 | Any user who has registered in order to personalize the portal or use the tools available only to registered users | <ul style="list-style-type: none"> <li>• Browses</li> <li>• Searches using publicly and/or customized tools</li> <li>• Has ability to personalize the My ExpertNet page to display subject-specific information of personal/professional interest</li> <li>• Gains access to additional collaboration and information tools</li> </ul>  |
| Expert (PI) (includes Speakers) | Any user who updates and maintains his or her ExpertNet data via the portal  | <ul style="list-style-type: none"> <li>• Is a registered user</li> <li>• Browses</li> <li>• Searches using publicly and/or customized tools</li> <li>• Has ability to personalize the My ExpertNet page to display subject-specific information of personal/professional interest</li> <li>• Gains access to additional collaboration and information tools</li> <li>• Has ability to update his or her Florida ExpertNet PI record and/or Speakers Bureau record and corresponding data</li> </ul> |

| Role                      | Description   | Responsibilities   |
|---------------------------|---|--|
| Center/Institute Director | Any user who updates and maintains his or her Center/Institute data via the portal  | <ul style="list-style-type: none"> <li>• Is a registered user</li> <li>• Browses</li> <li>• Searches using publicly available and/or customized tools</li> <li>• Has ability to personalize the My ExpertNet page to display subject-specific information of personal/professional interest</li> <li>• Gains access to additional collaboration and information tools</li> <li>• Has ability to update his or her Center/Institute record</li> </ul>   |
| Advisory Board Member     | A portal user who represents a specific user group and who participates in generating ideas and providing feedback to enhance content and usability of the portal | <ul style="list-style-type: none"> <li>• Is a registered user</li> <li>• Browses</li> <li>• Searches using publicly and/or customized tools</li> <li>• Has ability to personalize the My ExpertNet page to display subject-specific information of personal/professional interest</li> <li>• Gains access to additional collaboration and information tools</li> <li>• Uses formal and informal systems to provide feedback on ways to improve the portal</li> <li>• Acts as a representative of a specified portal user group</li> <li>• Consults with other users of similar interests to generate ideas on ways to improve/enhance portal features and usability</li> </ul>   |
| Community Leader          | Uses tools from the portal to collaborate and create a portal user community based on a specific area of interest   | <ul style="list-style-type: none"> <li>• Is a registered portal user</li> <li>• Browses</li> <li>• Searches using publicly and/or customized tools</li> <li>• Has ability to personalize the My ExpertNet page to display subject-specific information of personal/professional interest</li> <li>• Gains access to additional collaboration and information tools</li> <li>• Uses portal tools to create a community based on a specific area of interest</li> <li>• Creates mission statement for the community</li> <li>• Generates and elicits ideas and discussions</li> <li>• Responsible for content organization within the community</li> <li>• Actively contributes ideas, content, and responses to the user community</li> </ul> |

| Role             | Description  | Responsibilities  |
|------------------|--|---|
| Community Member | Participates in a portal user community based on a specific area of interest | <ul style="list-style-type: none"> <li>• Is a registered portal user</li> <li>• Browses</li> <li>• Searches using publicly and/or customized tools</li> <li>• Has ability to personalize the My ExpertNet page to display subject-specific information of personal/professional interest</li> <li>• Gains access to additional collaboration and information tools</li> <li>• Uses portal tools to collaborate and participate in a user community, based on a specific area of interest</li> <li>• Actively contributes ideas, content, and responses to the user community</li> </ul> |
| Moderator        | Monitors portal user community interactions                                  | <ul style="list-style-type: none"> <li>• Is a registered portal user</li> <li>• Browses</li> <li>• Searches using publicly and/or customized tools</li> <li>• Ability to personalize the My ExpertNet page to display subject-specific information of personal/professional interest</li> <li>• Gains access to additional collaboration and information tools</li> <li>• Monitors and moderates discussions within a particular community</li> <li>• Sets guidelines for appropriate discussions and behaviors</li> <li>• Ensures that discussions stay on target</li> </ul>           |







## **CONTENT MANAGEMENT**

A portal can only be as good as its content management strategy. This involves the process for acquiring, storing, and classifying content so that it may be retrieved in an efficient and timely manner.

### **Acquisition of Content**

Unlike a business enterprise portal, where the majority of content is provided internally, the core content for the Research Portal will be provided by external key partners. This content will be high quality, structured data as opposed to the mass of unstructured, disparate content typical of a large corporate portal.

### **Storing Content**

Initially, all content will be stored on one server at the Clearinghouse.

### **Classifying Content**

The largest hurdle in developing an effective portal that provides customized data delivery is the classification of the content. Successful development of a portal requires the marriage of information management and information technology. Although librarians have been classifying information for centuries, many in the IT world see customized data-delivery as a revolutionary concept. IT has traditionally approached data management through automated processes alone. Because quality indexing cannot be accomplished without some human mediation, there is no comprehensive automated software solution. There are various approaches to tackling this task with different outcomes. The basic dichotomy is between manual and automatic classification strategies.

Many organizations choose auto-categorizing software to take on this task as an efficient and low-cost means-to-an-end. These tools can screen a large number of items in multiple formats, and then with various approaches automatically sort items into taxonomy-like categories and attach these terms as metatags. This approach is particularly effective with very large sets of unstructured data, such as the Web. What is sacrificed in this strategy is accurate classification, and therefore precise and efficient content filtering and searching.

Automatic classification processes can be augmented by additional strategies to increase both accuracy of classification and the precision and efficiency of filtering. Trippe (2003) describes the following augmentation processes.

- Manual review of items with low-confidence accuracy in classification
- Visualization tools for mapping and navigating classified items
- Text-mining
- Pattern recognition
- Collaborative filtering
- Recommendation engines

An alternative approach is to use a taxonomy to classify items. A taxonomy is a controlled vocabulary for classifying information. Using a taxonomy for indexing generally requires a person to assign terms to describe an item. This strategy provides more accurate results than an automated process. It greatly improves content filtering and search precision and efficiency, but is costly in time and effort. Also, developing and maintaining a taxonomy is arduous and labor intensive. Pack (2002) quotes an estimate of \$100,000 for a typical taxonomy implementation.

Another approach is to merge the manual and automatic strategies for both taxonomy development and content classification. As an example, an auto-categorization tool could help identify categories that could then be reviewed by people for inclusion in the taxonomy as a means to develop and maintain a taxonomy. Then the software could use the revised taxonomy to categorize the documents. Any documents that fail to meet a particular confidence level, or that seem to require a new taxonomy term would then go to a human for review. Currently no out-of-the-box applications that can apply such a multipronged strategy have been identified.

### **Choosing a Classification Scheme**

Currently, Florida ExpertNet is using two types of taxonomies. For classifying experts, the Clearinghouse adopted an existing taxonomy of research descriptors developed by InfoEd International. InfoEd is a system that is similar to Florida ExpertNet that also classifies expertise. The selection of this taxonomy is described in detail by Augustyniak (2001).

A Florida ExpertNet Speaker's Bureau was launched in 2003. Because the research descriptor taxonomy was too detailed for this purpose, it was determined that a taxonomy with broader categories (subject headings) was needed. After reviewing existing taxonomies used for speakers' bureaus and not finding an appropriate match, a taxonomy was developed in-house.

The plan for the Research Portal greatly increases the scope of the content as well as the purpose of classification. A challenge in planning for the portal was deciding how to classify information within the expanded scope. Should very fine-grained research descriptors be used, or broad subject-headings, or both, or something else? The following are the issues that were addressed in developing the content management strategy for the Research Portal:

- Purpose of Classification—has expanded beyond searching to include customized content filtering
- Content to Be Classified—has expanded to include publications, news, awards, patents, events, e-forums, blogs, chats, and links
- End-Users—with the expansion of end-users to include registered users, sophisticated content filtering is needed
- Classification Selection and Implementation—existing taxonomies will not exclusively serve as the classification tool for portal content; some combination of automatic and manual processes will be used for both taxonomy creation and classification implementation

## Classification Planning Matrix

| Issues   | Classification Schemes |                         |                             |
|--|------------------------|-------------------------|-----------------------------|
|  | Subject<br>Heading     | Research<br>Descriptors | Automatic<br>Classification |
| <b>Purpose</b>   |                        |                         |                             |
| To allow registered users to filter content based on interests | X                      | X                       | X                           |
| To allow precise and accurate searching                        |                        | X                       |                             |
| <b>Content to Be Categorized</b>                               |                        |                         |                             |
| News Articles/Publications                                     | X                      |                         |                             |
| Experts/Centers and Institutes                                 |                        | X                       | X                           |
| Speaker Presentations  | X                      |                         | X                           |
| Events   | X                      |                         |                             |
| E-Forums   | X                      |                         |                             |
| Blogs  | X                      |                         |                             |
| Links to External Sites  | X                      |                         | X                           |
| <b>End-User Types</b>  |                        |                         |                             |
| General Public   | X                      |                         | X                           |
| Registered Users   | X                      | X                       | X                           |

## Content Inventory Matrix

The portal Content Inventory Matrix helps define the requirements, applications, and content of the Research Portal. This is a useful tool for decision making in determining what applications will be purchased or developed and the sources of content for each functional category.

| Functional Categories            | Subcategories  | Requirements/<br>Applications | Sources of<br>Content  |
|----------------------------------|--|-------------------------------|--|
| Collaboration/<br>Communications | E-Forums   | WebBoard                      | Community<br>Leaders<br>Registered Users   |
|                                  | Web Meeting  | WebMeeting                    | TBD  |
|                                  | Blogs  | WebBoard                      | Registered Users   |
|                                  | Chat   | WebBoard                      | Registered Users   |
|                                  | Briefcase  | ColdFusion<br>T-SQL           | Registered Users   |
| Research Tools                   | Locate Expertise<br>(Experts, Speakers,<br>Proposals, C/I,<br>Patents)                                 | ColdFusion<br>Verity          | Clearinghouse<br>Sponsored<br>Research<br>Technology<br>Transfer<br>Experts/Speakers<br>C/I Directors                    |
|                                  | Links to External<br>Sites (Patent<br>Offices,<br>Associations,<br>Cities, etc.)                       | ColdFusion<br>T-SQL           | Clearinghouse  |
|                                  | Publications/News<br>(Experts in Print,<br>University<br>Publications, Hot<br>Topics, News,<br>Awards) | ColdFusion<br>T-SQL           | Media Relations<br>Sponsored<br>Research<br>Technology<br>Transfer<br>Clearinghouse<br>Experts/Speakers<br>C/I Directors |
|                                  | Search Portal<br>(Keyword,<br>Advanced)  | ColdFusion<br>Verity          | Clearinghouse  |
|                                  | Saved Portal<br>Searches   | ColdFusion<br>Verity          | Registered Users   |
|                                  | Federated Search<br>Engine for Web   | TBD                           | Registered Users   |

| <b>Functional Categories</b> | <b>Subcategories</b>  | <b>Requirements/ Applications</b> | <b>Sources of Content</b>       |
|------------------------------|---|-----------------------------------|---------------------------------|
|                              | Ask an Expert   | WebBoard<br>ColdFusion<br>T-SQL   | Community Leaders               |
|                              | Ask a Librarian   | ColdFusion<br>T-SQL               | Clearinghouse                   |
|                              | Clipboard   | ColdFusion<br>T-SQL               | Registered Users                |
|                              | My Folders<br>(Publications,<br>Organizations,<br>Contacts) | ColdFusion<br>T-SQL               | Registered Users                |
|                              | Survey<br>Development/<br>Deployment/<br>Results            | ColdFusion<br>T-SQL               | Registered Users                |
| Planning Tools               | Calendar  | ColdFusion<br>T-SQL               | Clearinghouse<br>Advisory Board |
|                              | Tasks   | ColdFusion<br>T-SQL               | Registered Users                |

## **TECHNICAL ADMINISTRATION AND REQUIREMENTS**

Planning the technical administration of a portal is as important as planning for content and creative design. Of particular note is an evaluation of the skill set of existing Clearinghouse IT staff, expected training, and anticipated server planning.

### **Staff**

- Work with Windows-based IIS Web servers (version 5)
- Have familiarity with a variety of other Internet server applications
- Use and know ColdFusion, Javascript
- Have significant network expertise (VPNs, fire walling, wireless policy, etc.)
- Use and know Microsoft T-SQL

### **Training**

Successful adoption of the technology behind a portal requires that the existing IT staff be trained. Recommended training should include, but not be limited to, learning about

- XML, XSL, and XSLT, and portal/educational standards based on XML
- Java Version 2 Enterprise Edition (J2EE) and J2EE packages (EJBs, JNDI, RMI, etc.)
- Emerging Web Services standards (UDDI, WSDL, SOAP, JSR 168, etc.)

## Technical Requirements

The Clearinghouse vision for the Research Portal includes many general requirements that need to be addressed in the implementation of the Research Portal. The following table lists the technical requirements.

| Item                   | Description  |
|------------------------|--|
| Capacity               | <ul style="list-style-type: none"> <li>The portal should support inclusion of up to 60,000 experts, 20,000 registered users, and 500 concurrent users.</li> </ul>  |
| Performance            | <ul style="list-style-type: none"> <li>The portal will use resources efficiently. Specific guidelines should be determined.</li> <li>The portal will include tools to monitor portal performance and access characteristics. Periodic reporting of peak loads, average loads, and number of application and content accesses are required.</li> </ul>  |
| Browsers               | <ul style="list-style-type: none"> <li>Netscape 6.0 and above and IE 5.0 and above are required.</li> </ul>  |
| Operating Systems      | <ul style="list-style-type: none"> <li>Access to the applications software, resources, and data sources through the utilization of a browser interface is required. There must be accessibility from both Windows 98 and above and Apple computers (OS 9, OS 10).</li> </ul>   |
| Section 508 Compliance | <ul style="list-style-type: none"> <li>The portal must adhere to Section 508 of the Rehabilitation Act (29 U.S.C. 794d), as amended by the Workforce Investment Act of 1998 (P.L. 105-220), August 7, 1998.</li> </ul>   |
| Outside Access         | <ul style="list-style-type: none"> <li>Guest access to the portal must be available to anyone.</li> </ul>  |
| Customization          | <ul style="list-style-type: none"> <li>End-users must be able to customize their view into the portal, and their preferences must be retained for future reference.</li> </ul>   |
| User Profiles          | <ul style="list-style-type: none"> <li>Security profiles of each end-user must be maintained by the portal, including all associated links.</li> <li>Users must be able to specify the types of resources in which they are interested.</li> <li>The user profile information is based on the user roles and cannot be modified by the individual. This is the information that is used to determine the verified roles assigned to the individual.</li> </ul> |
| Roles                  | <ul style="list-style-type: none"> <li>Users must be able to be assigned to roles, have more than one role, and be changed from one set of roles to another. Content and applications are presented differentially based on a user's roles.</li> </ul>   |
| Roles and Security     | <ul style="list-style-type: none"> <li>To provide a secure, safe collaboration environment, users should be able to self-identify and, when their identity has been verified, register for the appropriate trusted (or verified) roles.</li> </ul>   |
| Single Sign-On         | <ul style="list-style-type: none"> <li>The secure applications within the portal should not require a separate sign-on.</li> </ul>   |

| Item                | Description  |
|---------------------|--|
| Identity Management | <ul style="list-style-type: none"> <li>Each user must have a unique identity that incorporates his or her role within the portal and a unique identifier. This identity determines what content and applications (or application features) are visible to this individual.</li> </ul>  |
| Content Management  | <ul style="list-style-type: none"> <li>The portal will provide a content management system that the portal administrative staff can use internally. This content management system does not need to be available to all users of the portal.</li> <li>Standards and procedures will be established that enable a widely distributed group of content providers to contribute portal content.</li> <li>The standards and procedures should be based on metadata provided in XML.</li> <li>A content taxonomy, with appropriate controlled vocabularies and best practices, should be provided so that content providers can appropriately classify the content as it is added to the portal.</li> </ul> |
| Content Publication | <ul style="list-style-type: none"> <li>The portal must be able to support creation and integration of content by a variety of trusted users (content providers). Content provided should be integrated seamlessly into the portal without intervention by portal administrative staff. Upon integration into the portal, applicable content should present itself to individuals with particular roles.</li> </ul>   |
| Collaboration Tools | <ul style="list-style-type: none"> <li>The portal must support messaging services between sites, individuals, and applications (forums, blogs, web meetings).</li> <li>The portal must support a calendaring function viewable by category, group, interest, and global.</li> <li>Web space should be provided (clipboard, text only).</li> <li>File space for individual files should be provided (briefcase, storage will be limited per user).</li> <li>Groups should include discussion boards, shared file space, mailing lists, subgroup creation rights, etc.</li> </ul>  |
| Security            | <ul style="list-style-type: none"> <li>The portal must provide security for stored profile and personal information.</li> </ul>  |
| Search Tools        | <ul style="list-style-type: none"> <li>A search tool for portal contents and applications (or the Web) must be provided.</li> </ul>  |

## SECURITY PLAN

As with any portal the security of the data both from a business and technical standpoint is paramount. Creating policies and procedures to create the most secure environment possible is a critical step in the planning process.


The following is a list of key issues and concepts that will be addressed in developing policies and procedures for the security of the portal:



- Data Classification—personalized data needs to be made secure and available to an owner/specific audience
- Encryption—encrypting data (if necessary)
- Access Control—controls how resources are accessed so they can be protected from unauthorized modification or disclosure
- Configuration Management—the process of integrating security policy and the technical security control mechanisms. Antivirus management and testing that secure data is only accessible to authorized users are key aspects of configuration management.
- Physical Security—the most important aspect of a secure environment is the physical security of the servers. The security of the physical location (locked, only authorized access) and environment (climate controlled) are concerns that need to be addressed.
- Disaster Recovery—a recovery plan should be developed that includes the proposed recovery time based on the type of failure (hardware or software).
- Backup Hardware and Software—outlines how often the data is backed up (daily, weekly, monthly) and where the backups are stored (at a minimum weekly backups should be stored off-site). The software and hardware used to perform backups should also be outlined.


## **CREATIVE PROTOTYPE**

The following are two preliminary prototype visual designs (guest and registered users) of the front page of the Research Portal. The guest user page is openly accessible to anyone who visits the URL. This page provides the whole universe (unfiltered) of research information across disciplines. The registered user page will appear once the user has logged in and will display research information and applications that have been filtered based on the specifications of the user. These samples reflect the baseline content and design characteristics and are a starting point for defining the look and feel of the Research Portal as well as its functionalities and content. Based on Web development systems standards, a full prototype will be created before production begins in order to avoid confusion and disappointment in design and functionality. It is much easier and time- and cost-efficient to correct mistakes or request changes before the actual coding begins.



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**Custom Research Portal Login**

Username

Password

[I'm a new user.](#)

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**Search**

Search by Keyword

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General Search by Keyword

My Profile

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Employer: Department of Environmental Protection - optional  
Education: MS  
Available for Contact: Y  
Receive Newsletter: Y  
Contact Information:  
850-555-1212  
darla\_b@cites.fsu.edu  
Profile Viewable by Other Users: Y  
Content/Filters: Marine Biology, Biomedical

Calendar

March

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | 31 |    |    |    |    |    |

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## **Next Steps in the Transition Process**

Planning for the production of a portal begins after completing the process of defining the vision, administrative processes, administrative and user roles, content management, technical administration and requirements, and the creative prototype. The following are the next steps in the transition before development and production begins.

- Finalize key partnerships
- Finalize virtual advisory boards
- Conduct focus groups
- Finalize full prototype
- Assess hardware/software needs
- Assess human resource needs
- Calculate development costs
- Create development plan and schedule
- Create implementation plan

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