
# Creating and Maintaining a Geoportal—Management Considerations

ESRI 380 New York St., Redlands, CA 92373-8100 USA
TEL 909-793-2853 • FAX 909-793-5953 • E-MAIL info@esri.com • WEB www.esri.com

# Creating and Maintaining a Geoportal—Management Considerations

## An ESRI White Paper

**Contents** **Page**

J-9737

**Contents** **Page**

# Creating and Maintaining a Geoportal—Management Considerations

## Introduction

### *Purpose and Scope of This Document*

The principal purpose of this document is to describe the level and breadth of management commitment required to install and maintain a Web-based geoportal.

### *What Is a Geoportal?*

A *portal* is a Web-accessible catalog that enables the posting, discovery, and exchange of information resources.

A *geoportal* is a portal that specializes in the posting, discovery, and exchange of map-based geographic information resources and is commonly installed as an element of a more comprehensive spatial data infrastructure (SDI).[1]

### *Applicability of This White Paper*

While this document identifies the management considerations and dedication of resources essential to the successful installation and ongoing operation of a geoportal developed with ESRI® ArcGIS® Server Geoportal extension software in particular, findings are also applicable at a generic level to the installation and ongoing operation of *any* geoportal.

A geoportal can be implemented to support the discovery and exchange of geospatial information at a working-group level within an organization, at the organization level, across a designated community of organizations and other stakeholders, or as an element of a broadly based spatial data infrastructure that connects users throughout the world.

The discussion that follows identifies and elaborates on management issues in the context of an organization-level geoportal. The same discussion is scalable and applicable to any level of geoportal operation.

### *Overview of Contents*

Management issues recommended for consideration and action prior to installation of a geoportal are described at the outset of this document. That is followed by descriptions of installation, prelaunch, and operation-phase requirements and tasks. A summary review of principal prerequisites for geoportal success concludes the document.

[1] The term *spatial data infrastructure* denotes a framework of technologies, policies, and institutional arrangements that together facilitate the creation, maintenance, exchange, and use of automated geospatial data and related information resources across an information-sharing community.

## Creating a Geoportal—Considerations for Management

### *Executive Charter or Sponsorship*

***A geoportal needs clear sponsorship.***

Operation of a geoportal by any organization—large or small—can have a profound impact on the way geographic information is produced, managed, used, and shared by that organization. Likewise, maintenance of an operational geoportal can have an impact on the structure and allocation of an organization's technical and personnel resources. For these reasons, it is advisable that a decision to move forward with implementation of a geoportal be informed at the outset by a clear statement of objectives and a clear understanding of the organizational implications of doing so.

The process of establishing a charter or other formal expression of management intent will provide the opportunity for management's full consideration of the business case for geoportal implementation, including objectives, resource requirements, and benefits specific to the organization, prior to making the commitment to install. The formal expression of management intent that results from such a process will itself be essential to the successful establishment and stakeholder participation in a geoportal within an organization.

Whether the communication of executive support is issued in the form of a legal charter, policy statement, or directive or by other means, formally stated backing from management will motivate the acceptance and support that are essential to the successful deployment of an organization's geoportal once the decision to proceed has been made.

### *Base of Operations*

***A geoportal needs a clearly designated base of operations.***

Such a designation requires reinforcement by management-mandated allocation of staff, facilities, and funds to ensure ongoing utility and vitality. Experience shows that where no management mandate exists for establishing a geoportal at a particular point of installation within an organization (or within a broader information-sharing community), political issues and insufficient organizational resources can lead to limited success.

Most often, the base of operations for a successful geoportal within an organization will rest with the IT department or the agency responsible for geographic information system (GIS) technology.

### *Funding*

***A geoportal needs sufficient funding to realize its potential value.***

The creation and healthy growth of a geospatial information portal requires more than a onetime software purchase. The principal costs are related to allocation of the organizational support structures, technologies, and staff time that are necessary to support a geospatial information portal over time. While a geoportal will likely realize cost benefits for an organization by increasing the efficiency of GIS data distribution, reducing redundant data creation, and standardizing the quality of geospatial data used in daily operations, it will also involve ongoing line-item management costs.

Principal cost items will include the following:

- Establishment and maintenance of organizational arrangements and internal workflows that may be necessary to implement an SDI in general and to host and support geoportal operations in particular
- Hardware and underlying software
- Staff time for geoportal installation including programming for any organization-specific customizations
- Staff time to undertake geoportal content management
- Staff time to undertake geoportal operations management
- Staff time to prepare and maintain participating data services and associated metadata
- Technical training on geoportal management and use

Though costs will vary depending on the specific role of the geoportal and its intended scale of operation, each installation will nevertheless require some level of funding related to the cost items listed.

- *Initial Funding*—Organizational arrangements and workflow engineering, hardware, and underlying software (assuming the intended number of users, frequency of use, and size of the metadata database are correctly anticipated at the outset) will all require a onetime capital expenditure. Likewise, technical installation, management training, and inaugural user training will require a onetime expenditure with minimal subsequent training costs as management personnel change (new users will be assisted by online help and intuitive interfaces).
- *Ongoing Funding*—Staff time will be the principal ongoing cost and will change (increase or decrease) depending on how the scale of operations develops.

  The most significant factors for anticipating and scaling staff costs are (1) the number of metadata records (citations to geospatial information services and other items) that are published on the geoportal and the frequency of new metadata submittals, (2) the number of users and frequency of use, and (3) the extent of user-based functionality that is maintained (collaborative tools, special interest group functionality, user security functionality, user tracking tools, etc.).

In general, experience shows that a small internal geoportal that services a known, static number of users and a known, relatively static number of metadata records—after establishment of its inaugural user base and metadata base—will require minimal content management, possibly accomplished on a part-time basis by a single staff member. A geoportal for a globally accessible spatial data infrastructure with tens of thousands of metadata records and thousands of users can require full-time management by a dedicated group of 5 to 10 professionals.

## *User Outreach*

***A geoportal needs a prelaunch user outreach plan.***

The existence of a geoportal within an organization—or within a broader interorganizational user base—can significantly impact the way business is done.

Data production and use workflows may change when the geoportal mechanism for data discovery and exchange is made available, and data creation responsibility itself can be more narrowly assigned because datasets will be discoverable even if they are produced only by a single source (redundant data creation undertaken by each user in the absence of such discoverability will no longer be necessary).

A user outreach plan designed to introduce the value and utility of a geoportal prior to launch will encourage acceptance and positive anticipation of the change the geoportal will engender. Communication of management intentions for the specific use of the geoportal to enhance productivity in the existing workflow context will also advance acceptance. Those same workflow-based intentions can also provide a baseline for tracking usage and measuring success.

Though the ultimate impact of a geoportal will likely be beneficial and exciting for its stakeholder community, the idea of changing workflows and routines can often be initially challenging. For this reason, commencement of a formal outreach effort to promote acceptance and adoption of the geoportal prior to installation is recommended.

## *Required Technology Environment*

***A geoportal needs supporting hardware and software in its underlying operational environment.***

The specification of hardware requirements for support of a geoportal will necessarily be tied to the existing architecture of the hosting organization and the intended level of use. In general, however, common practice for running all geoportal software components is to use a minimum of two dedicated servers with Internet connectivity along with at least one desktop computer with Internet connectivity. In addition, provision of database servers within the hosting organization will be required to serve data maintained by the organization itself. Networking hardware and capacities will be dependent on the intended scale of operations for the geoportal and on the size and location of the stakeholder community.[2]

Underlying software required to support a geoportal built with ESRI's ArcGIS Server Geoportal extension is detailed in the online ESRI Web help page that presents preinstallation requirements for ArcGIS Server Geoportal 9.3.1 (see http://webhelp.esri.com/geoportal_extension/9.3.1/index.htm#preinstallation.htm). Organizations contemplating implementation of a geoportal often already have licenses for much of the needed underlying software. Nevertheless, a review of an organization's existing software and architecture, together with a review of the specific software required to support a geoportal, is recommended to determine the level of effort and expense that will be involved in preparing for implementation of a geoportal.

## *Required Data Environment*

***A geoportal is of no use without data.***

To serve its purpose, a geoportal needs accessible GIS data services and high-quality, complete metadata that describes those services. Data services and other GIS data items must be maintained as described by the associated metadata.

This means that data and data services must be cataloged systematically according to a metadata standard and schema designated by the geoportal host organization or stakeholder community. This data cataloging and maintenance work is ongoing, and the associated costs reflect the amount and type of data that is published using the geoportal.

[2] Hardware requirements specific to the use of ESRI's ArcGIS Server Geoportal extension for geoportal creation and operation are identified at esri.com.

Since a geoportal is really about data, this data inventorying and maintenance element of geoportal support is the single most important investment required. If the metadata describing data is faulty, and if the data described is out-of-date, wrong, or only available sporadically, a perfectly functioning geoportal will be of little use.

Though data can be maintained and associated metadata can be created and published on a geoportal by entities other than the portal's host organization (depending on the designated breadth of the stakeholder community), the host organization will be responsible for reviewing metadata prior to publication to ensure its completeness and conformity to established standards and schemas.

Prior to geoportal installation, it is recommended that a host organization's management conduct an inventory and review of the data it currently maintains (and that its stakeholder community maintains) in order to understand the level of effort that will be involved in installing and maintaining a viable and useful geoportal.

## Required Staffing

***A geoportal needs staff support.***

Significant staff time is required to maintain and use a geoportal. Geoportal management requirements will vary depending on a hosting organization's intentions and the extent to which the COTS functionality of the geoportal is engaged (i.e., uniquely customized geoportal code will require more staffing to support it than a COTS-based geoportal). In all cases, however, people will be needed to perform the following roles:

- Chief information officer
- Geoportal operations manager
- Geoportal content administrator
- Geoportal metadata publishers (external and internal)
- End users

These roles need to be formalized in the context of each hosting organization's staffing arrangements and with a view toward the breadth and frequency of geoportal use. The costs of dedicating time for the geoportal management and user responsibilities can be balanced against the efficiencies realized by a fully functioning mechanism for discovery and exchange of geospatial information and the extent to which that can support the central mission and workflows of the organization itself.

## Technology Transfer and Training

***A geoportal needs a training program.***

A formal training program for geoportal managers and users is essential to success. Such a program will consist of both installation-phase technology transfer and the ongoing training of general users.

Installation training for geoportal managers and operations personnel is normally three to five days. User training is normally one day at the outset, with refresher sessions over time. This basic training program may be supplemented by training in cataloging (metadata creation) or other specialized geoportal-related activities.

Promotion of acceptance for the geoportal at the initial stages—including provision of clear direction on how management intends the geoportal to support the work of stakeholders in the context of their workflows—can be effectively undertaken as part of a formal training program as well.

### *Summary of Recommended Preinstallation Management Actions*

In summary, the following basic management actions are recommended prior to installing a geoportal in an organization:

- Establish an executive charter or sponsorship.
- Designate a base of operations.
- Authorize funding.
- Plan a prelaunch user outreach strategy.
- Review the required technology environment.
- Review the required data environment.
- Provide required staffing.
- Anticipate technology transfer and training.

Each organization contemplating the installation of a geoportal will need to tailor its decision-making and preparation activities to its own policies and practices. This list of recommended actions is intended to introduce such organizations to a scope of generic management issues that may inform their decision making and program for geoportal installation and operation.

## Managing Geoportal Installation

### *Scope of Required Geoportal Installation Activities*

In addition to generic management activities and actions that may be taken prior to installation as recommended above, the following represents the scope of technical activities specific to installation of geoportal software:

- Undertake geoportal software installation training if available (ESRI offers a three-day installation training course for the ArcGIS Server Geoportal extension).
- Identify intended breadth and level of use of the geoportal.
- Designate how the selected geoportal software and its components will fit into existing architecture, including existing firewall architecture.
- Modify existing architecture/firewall policies that may be required to meet geoportal use objectives and requirements.
- Install and/or configure hardware and firewall connections per architecture.
- Install and/or configure underlying software as required.
- Locate or create required data services.
- Install geoportal software and components.
- Undertake prelaunch user outreach program.

An out-of-the-box version of a geoportal—ready for prelaunch detailing—will result from these activities. Likewise, the core technical staff—if trained in the context of geoportal installation—will be prepared to undertake the prelaunch detailing.

### *Staffing Required for Geoportal Installation Tasks*

Generic staff roles that will be engaged in geoportal installation activities are as follows:

- Chief information officer
- Geoportal operations manager
- Geoportal content administrator

The chief information officer (or other technical lead with overall responsibility for the geoportal) will identify the breadth and location of the stakeholder community, determine the projected level of use, and specify system networking and load requirements accordingly. The chief information officer will also refine the existing systems architecture, adjust associated policies necessary to enable the geoportal and its components to fit, arrange for technical staff installation training, and undertake prelaunch user outreach activities.

The geoportal operations manager (or other technical manager with authority to configure organization systems) will install and/or configure hardware and firewall connections according to the architecture provided by the chief information officer, install new underlying software as indicated by the architecture, undertake geoportal installation training, and install the geoportal.

The geoportal content administrator will undertake geoportal installation training, identify basic external data services required to support geoportal functionality, and manage stakeholder access.

### *Options for Geoportal Installation*

ESRI is available to assist with on-site installation of geoportals that are based on ArcGIS Server Geoportal extension software. Under the direction of the chief information officer, geoportal operations manager, and geoportal content administrator, ESRI or ESRI-authorized agents can be contracted to assist with all ArcGIS Server Geoportal extension-based geoportal installation activities.

## Managing Prelaunch Detailing

### *Scope of Geoportal Prelaunch Detailing*

Once the geoportal software is installed and the hosting organization's technical staff is trained, additional steps will be required as follows to prepare for launch:

- Delete portal installation test data files (test accounts, test metadata, test channels, etc.).
- Apply custom interface graphics (organization banner, colors, etc.).
- Apply custom interface content (help text, disclaimer text, About Us text, etc.).
- Configure portal to basic services.
- Engage inaugural content creation/management team.
- Create and load inaugural metadata.
- Conduct prelaunch testing.
- Designate how the geoportal will support existing workflows.
- Design user training and outreach programs.
- Conduct inaugural user training.

At the conclusion of these activities, the portal will be ready for inauguration and the organization will be ready to initiate its geoportal outreach and operations programs.

### *Staffing Required for Prelaunch Detailing Tasks*

Generic staff roles involved in geoportal prelaunch detailing activities are as follows:

- Chief information officer
- Geoportal content administrator
- Geoportal metadata publishers
- Geoportal end users

The chief information officer (or other technical lead with overall responsibility for the geoportal) will provide banner graphics or other organization graphics, designate how the geoportal will support existing workflows, and design user training and outreach programs.

The geoportal content administrator will delete portal installation test data files, apply custom interface graphics, apply custom interface content, and configure the portal to basic services. This person will also nominate and engage an inaugural content creation/management team consisting of key publishers who will perform inaugural tasks: load metadata, conduct prelaunch testing, and coordinate user training.

The inaugural geoportal metadata publishers (internal to the hosting organization or external to the organization as engaged by the geoportal content administrator) will create and load inaugural metadata and synchronize and verify links between metadata and associated data services.

Key end users will attend the inaugural user training.

### *Options for Geoportal Prelaunch Detailing*

Under the direction of the chief information officer or geoportal content administrator, ESRI or ESRI-authorized agents can be contracted to assist with all ArcGIS Server Geoportal extension-based geoportal installation activities.

## Managing Geoportal Operations

### *Scope of Geoportal Operations*

The following activities will be ongoing and require a continuing allocation of sufficient authority, funding, and other organizational resources required to maintain and grow the geoportal:

- Maintain geoportal hardware/software environment.
- Maintain geoportal database environment.
- Review and perform QA/QC on all newly submitted metadata and metadata links.
- Update metadata records as associated data services change.
- Review and perform QA/QC on all newly modified metadata records.
- Manage geoportal administrators.
- Consolidate use statistics.
- Apply for and maintain funding.
- Conduct outreach and user training.

### *Staffing Required for Geoportal Operations Tasks*

Generic staff roles involved in geoportal operations activities include the following:

- Chief information officer
- Geoportal content administrator

- Geoportal operations manager
- Geoportal metadata publishers
- Geoportal end users

The chief information officer will apply for and maintain funding and staff time for the ongoing geoportal operations and manage the geoportal activities of the geoportal content administrator.

The geoportal content administrator will submit funding and staff requests, review and perform QA/QC on new metadata and metadata links as submitted as well as all newly modified metadata records, consolidate and publish geoportal use statistics, and conduct outreach and user training.

The geoportal operations manager will maintain the underlying geoportal hardware/software environment and the geoportal database environment.

The geoportal metadata publishers (internal at cost to the host organization and external with no cost to the host organization) will submit updates to the metadata catalog consisting of new metadata to reflect new data services and metadata modification to reflect changed data services.

The end users will engage the geoportal to discover and download or otherwise access data in the course of their jobs.

## *Options for Geoportal Operations*

Ongoing operations are the responsibility of the host organization unless hosting is outsourced. In the event hosting is outsourced, the geoportal would still require that the geoportal content administrator, geoportal metadata publishers, and end users participate as described above.

## Conclusions for Management

To be successful for a hosting organization, a geoportal requires clear executive sponsorship. Both the dedication of resources required at the outset for geoportal installation and the dedication of resources required for the ongoing vitality and growth of the geoportal will be highly dependent on such sponsorship. Likewise, the ready adoption and use of the geoportal by staff members to support their daily workflows and realize associated efficiencies will be greatly encouraged if management backing is understood.

To provide clear executive sponsorship, the host organization's management must first be convinced of the value of hosting a geoportal by reviewing the breadth of requirements and outcomes that it can expect. This document provides a checklist of issues that have a bearing on the adoption and maintenance of a geoportal by an organization and is intended to provide a starting point for management.

## For More Information

For additional information specific to the ArcGIS Server Geoportal extension and associated installation and hosting requirements, please contact

ESRI Professional Services
380 New York Street
Redlands, California 92373
Attn.: SDI Solutions Team
E-mail: portal@esri.com

Or, go to the ESRI Web site at www.esri.com/gisportal.

## About ESRI

For four decades, ESRI has been helping people make better decisions through management and analysis of geographic information. Our culturally diverse staff work with our business partners and hundreds of thousands of people who use GIS to make a difference in our world.

A full-service GIS company, ESRI offers support for implementing GIS technology from the desktop to enterprise-wide servers, online services, and mobile devices. GIS solutions are flexible and customizable to meet the needs of all our users.

## Our Focus

At ESRI, we focus on promoting the value of GIS and its applications throughout the world and pay close attention to our users' needs. Our software development and services respond to our customers with products that are easy to use, flexible, and integrated. Our technology is multidisciplinary, productive, and valuable to our users.

We have a strong commitment to educating our customers through ESRI's various training programs. ESRI is a socially conscious business and invests heavily in issues regarding education, conservation, sustainable development, and humanitarian affairs.

## Contact ESRI

1-800-GIS-XPRT (1-800-447-9778)
Phone: 909-793-2853
Fax: 909-793-5953
info@esri.com
**www.esri.com**

Offices worldwide
**www.esri.com/locations**

**ESRI**
380 New York Street
Redlands, California
92373-8100 USA