RECLAMATION

Managing Water in the West

Recommendations, Best Practices and Guidelines for Linking Documents in SharePoint

Linking Documents and Information Stored in SharePoint Libraries to Geospatial Representations of Reclamation Features

Project 2998
Science & Technology Program

U.S. Department of the Interior
Bureau of Reclamation

Last Updated: 9/23/2010

TABLE OF CONTENTS

1 Introduction

1.1 Purpose of this Document

The purpose of this document is to compile recommendations, best practices and guidelines for linking documents to features in SharePoint document libraries, or file system structures.

1.2 Limitations

The information in this document is necessarily limited to a single capability of SharePoint – the document library. This document focuses on recommendations, best practices and guidelines for structuring content in SharePoint document libraries. It also provides recommendations, best practices and guidelines for creating or modifying geospatial data of Reclamation features that have related documents.

2 SharePoint Document Libraries

2.1 Why Use SharePoint?

The first question that should be asked is "Why use SharePoint". The answer to this question requires an evaluation of not just a few components, but the entire platform. If the answer is limited to an evaluation of only a few components, the benefits of using SharePoint will be limited.

An evaluation of SharePoint should be conducted in the context of evaluating the processes and work flows performed by a program in the accomplishment of Reclamation's mission. In Reclamation, technology is too often fit into existing processes and work flows. Far greater benefits can be realized when processes and work flows are re-engineered to leverage technology. This is especially true with SharePoint.

2.2 Capabilities of SharePoint Document Libraries

A SharePoint document library has some most capabilities that can result in measurable benefits. These capabilities include:

- A central shared area for storing documents as opposed to all over the network, resulting in improved organization and improved storage efficiency.
- Automatic indexing, providing the ability to find documents in less time and thereby improving employee productivity.
- Document check-in/check-out ensures that updates are controlled and users don't overwrite someone else's work.
- Automatic versioning of documents, enabling history to be maintained and providing roll-back capabilities.

Many Reclamation programs have generated substantial collections of documents over time. In most cases, these legacy documents would not benefit from most of the capabilities listed above, except for perhaps a central shared area for storing documents. If current file system based solutions for storing legacy documents are functional, then the benefit of moving them to a SharePoint document library should be carefully considered.

SharePoint will pay its best dividends where a program evaluates and modifies its processes and defines work flows in the context of SharePoint and other technologies.

2.3 Considerations for SharePoint Document Libraries

Windows SharePoint document libraries provide a flexible repository for storing and accessing digital documents. There are some important considerations that a program should address before implementing SharePoint document libraries. Some key considerations are presented below in the form of questions.

- If a set of documents are currently stored and accessed in file system, what are benefit(s) of putting the documents in a SharePoint library?
- Are documents collaboratively created and managed as part of a work flow?
- Are contributions to the set of documents made by multiple offices locations?
- Do documents have unique file names?
- Can documents be organized in a hierarchical structure?
- Who will be responsible for maintaining the contents of the document library?

The answers to these questions provide the information needed to determine whether or not a SharePoint document library is appropriate for a set of documents or a program's processes and workflow.

2.4 Organizing a SharePoint Document Library

A SharePoint document library does not have a built-in framework for organizing documents. Users must create an organizational structure for storing documents. The SharePoint document library web part is a list that contains some basic information to track and identify documents, including: title, username, created date, modified date, and the document (binary format). The filename of a document must be unique within a library.

There are two options for organizing documents in a SharePoint document library: folders or metadata fields (custom fields). Although these options can be used in conjunction, it is recommended that only one or the other be used.

Metadata Fields Custom fields can be added to the internal fields in a document library to carry pertinent information about documents. These fields are presented to the user in a web form when a document is uploaded to the library. Custom fields can be either required or optional. Document filenames must be unique.

The use of metadata fields is the recommended way to organized documents in a library. Metadata fields can be used in the creation of custom Views to display the contents of a document library using Group By. Multiple metadata fields enable multiple Views of the document library contents. Up to two metadata fields can be used together to create a hierarchical View.

Folders Folders can be created in a document library that are similar in function to folders in a file system. Note that folders can limit how a document library can be displayed using Views. It is recommended that folders be used only in cases where documents share filenames in common. In this case, folders must be used. Although folders are familiar to users, their use in SharePoint should be limited where possible.

2.4.1 Lands Transaction Documents

Lands transaction documents typically consist of forms, deeds, contracts, and agreements associated with one or more parcels of land. These documents are commonly in Adobe PDF format, largely because most are legal instruments that must be scanned to capture signatures.

The land parcel represents the map feature to which documents are related. Lands documents are typically organized in one of two structures: 1) project, plat, and index, or 2) project and parcel ID.

In both structures, features (land parcels) need to have a set of attributes (fields) that contain values that correspond to the organizational structure of lands documents. These attributes can them be used in combinations to define queries that can link features to the location of the corresponding document(s).

The limitation to this approach is that it does not handle complex relationships where a document more than one land parcel or interest (feature). This is described further in Section 3.

There are cases where a land parcel may be associated with more than one lands document (e.g., contracts, leases). These complex relationships are difficult to handle in a file-based structure. Typical solutions are to duplicate documents or to place the document higher in the structure. Both solutions can complicate linking documents to features.

2.4.2 Facilities Operations & Maintenance (O&M) Documents

Generally, the relationships of documents to features of interest to Facilities O&M tend to be less complex that lands. However, Facilities O&M documents also tend not to be managed in consistent well-organized structures. A well-

2.5 Organizing Documents in a File System

The approach to linking features to documents can also be implemented when documents are stored in an accessible file system. As with a SharePoint document library, a collection of documents must have a well-organized, hierarchical

structure. In the case of the file system, there is only one choice for structure – folders. The names of folders provide the values that need to be matched in attributes of features.

2.6 Using Views

SharePoint document libraries, as well as other web parts, have a built-in Group By function that can be used to create custom views of a document library. When metadata fields are used with the Group By function, a view can be created that mirrors a folder structure to two levels without effecting the actually structure of documents. This feature can be useful for meeting the sometimes differing needs of users of documents. With metadata fields, multiple views of the same document collection can be created as needed to meet user needs.

3 Mapping of Reclamation Features

3.1 Identifying Feature Attributes for Linking Associated Documents

The link between a feature and related documents requires that features have attributes that correspond to folders or metadata field values used to organize a document collection. Reclamation features are geospatial data that have attributes that describe characteristics of the feature. Existing geospatial data sets representing Reclamation features may require modification if attributes necessary for linking are not already present. Examples are provided later in this section.

Geospatial data for Reclamation features in some locations have not yet been created. In these cases, attributes needed for linking can be added to the schema when the geospatial data are created. Where available, it is highly recommended that a standard schema be used. Standard geospatial data schemas are typically designed to be extended with additional attribute fields or tables.

Linking features to documents depends on matching one or more attributes to the well-organized, hierarchical structure of a document collection. This applies to document collections stored in SharePoint or a file server. The following subsections describe examples for lands transaction documents. An good example for Facilities O&M documents was not readily found.

3.1.1 Example – Lands Transaction Documents

As noted in Section 2, lands transaction documents are typically organized in one of two structures: 1) project, plat, and index, or 2) project and parcel ID. In the prototype the lands transaction documents are organized in folders by project, plat, and index.

The figure below shows the attribute table of the geospatial data set of land parcels for the Klamath Project.

Table

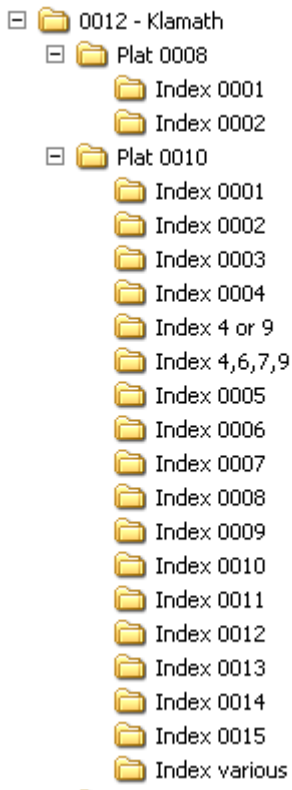
KlamathPlats

OBJECTID_1 *	PROJECT	PLAT	INDEX_	SUFFIX	TRACT	METHOD	WITHDRAWN_	WITHDRAWN1	RESTORED	F
1	0012	0010	0001	00		PLAT	0	0	1	
2	0012	0010	0001	00		PLAT	0	0	0	
3	0012	0010	0001	00		PLAT	1	1	0	
4	0012	0011	0001	00		PLAT	1	1	0	
5	0012	0011	0001	00		PLAT	1	1	0	
6	0012	0011	0001	00		PLAT	1	1	0	
7	0012	0012	0002	00		PLAT	0	1	0	
8	0012	0012	0003	00		PLAT	1	0	0	
9	0012	0012	0008	00		PLAT	0	0	0	
10	0012	0012	0005	00		PLAT	0	0	0	
11	0012	0012	0011	00		PLAT	0	0	0	
12	0012	0012	0005	00		PLAT	0	0	0	
13	0012	0012	0012	00		PLAT	0	0	0	
14	0012	0012	0010	00		PLAT	0	0	0	
15	0012	0012	0003	00		PLAT	1	0	0	
16	0012	0012	0005	00		PLAT	0	0	0	
17	0012	0012	0003	00		PLAT	1	0	0	
18	0012	0012	0005	00		PLAT	0	0	0	

0 (0 out of 139 Selected)

KlamathPlats

The values in the highlighted fields are the "keys" for linking geospatial features to documents stored in the folder structure shown below.



The values in the attribute table of the geospatial data correspond to the numbers in the folder names. Note that names do not need to match exactly as long as clear pattern is followed (e.g., Plat ### and Index ####). Also note the couple of Index folders that do not follow the pattern. These folders are problematic because they are special cases that are not easily handled.

Special cases should be avoided whenever possible. The cost of handling special cases often exceeds the total cost of handling the primary case.