Electronic Work Flow and Digital Asset Management

Part 1

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This paper, the first of two parts, is concerned primarily with the procedures established for the movement of digital assets within the department of Biomedical Communications, Wake Forest University School of Medicine. A more thorough discussion of digital asset management as it relates to electronic work flow will be the subject of Part II.

Introduction

Storing and retrieving images has always been a frustrating and time-consuming endeavor. In the past, slides, negatives, and prints had to be stored in a fashion that would ensure no change to their physical characteristics over time. Today, most images are created electronically and stored as files on a computer system. While the risk of physical changes and damage is near nonexistent with electronic assets, storing and retrieving image files, in general, is not much easier than it was with their film-based counterparts. A standardized system of strictly-adhered-to procedures is the only way to make certain that the image files stored today may be easily retrieved tomorrow.

System Overview

The system used at Wake Forest School of Medicine can be broken into four interrelated tasks:

1. Collecting images
2. Naming images using standard nomenclature
3. Categorizing image files into three standardized groups
4. Captioning each image using standard terminology

This system currently has about 50,000 records spread over nine databases, representing 34 GB of online, and 111 GB of offline stored image files. We define asset management as those tasks required to label and classify images so that they and any associated information are easily retrievable. We use Cumulus 5.5 (www.canto.com) and Rename 1.4a (www.1-4a.com) for this purpose. The end product is a series of catalogs, each of which contains a thumbnail of the original photograph, image annotation information, and user-applied categories that relate to image content.

Electronic work flow is defined as movement of files from initial capture to final archive. We use Cumulus 5.5 and Adobe Photoshop® (www.adobe.com) for these tasks. Our department is server centric. All images are saved on a server. Only programs reside on local machines. Substituting "folder" for "volume"

would allow a nonserver-based department to implement a similar scheme.

A brief overview of file movement and server structure follows:

Raw Volume

All camera files except portraits and medical images* are saved on this server volume. A single Cumulus catalog is made from these images.

Immediately after a portrait sitting, the client reviews and chooses his or her portrait. The final image is saved in the portrait folder. There is a corresponding Cumulus catalog of portraits. The card is wiped clean after the image is chosen. All medical images are processed in Photoshop and delivered to the requesting physician. No copies are kept within the department.

Working Volume

Edited subsets of raw files, which are typically layered Photoshop files, are saved in one of the following folders on the working volume:
• *Digital Images to be Cataloged* (brochure and other publication photos)
• *Digital Infinity to be Cataloged* (grip and grins)
• *Group Photos to be Cataloged*

Cumulus and Photoshop are used in concert to edit the raw file images and save them to their appropriate folders.

Archive Volume

All the files from working folders are flattened and saved as JPEG in one of the following folders on the archive volume:
• *Image Archive*
• *Infinity Archive*
• *Group Photo Archive*

Each of these folders has a unique Cumulus catalog. (Part II will deal more completely with the subjects of these catalogs and the role they play in digital asset management.)

Raw Volume Files

After a photographer returns from an assignment, images are renamed, copied to the server, cataloged, and captioned. An assignment is not considered complete until all these tasks are performed. A detailed description follows.

Renaming

Files are renamed using Rename 1.4a according to the following scheme:

Alpha Alpha, Date, Sequential Number (AAmmddyy##)

The two-letter alpha represents a broad categorization of the

image's subject. All of our categories are listed in Table I. This naming scheme ensures that all file names are unique. Also, and just as important, the file name provides some information about the image. For example, an image named PE100202107 is an environmental portrait shot on October 2, 2002.

The specific categories one uses are not important. What is important, however, is having enough categories to ensure some separation of images, but not so many that deciding the correct category becomes difficult.

AD	Administration	PC	Patient Care
AE	Aegis	PS	Portrait Studio
AS	Auxiliary Health Services	QC	Qualchoice
BI	Building Interiors	RD	Radiology
BL	Buildings	RE	Religion
BP	Background/Patterns	RS	Research
CS	Community Service	SD	Studio
DN	Dentistry	SE	Special Events
ED	Emergency Department	SP	Special Procedures
LS	Life Styles	ST	Student
NC	North Carolina	TE	Teaching
NR	Nursing	WF	Wake Forest
OC	Off Campus	WS	Winston Salem
OR	Operating Room		

Table 1 *Image Categories.*

Copying to, and Retrieving, from the Server

All camera files, except portraits and medical images, are saved on the *Raw Files 2004* server volume. (There were also volumes labeled *Raw Files 2003, Raw Files 2002,* etc.) Absolutely everything is saved. We do not allow any "in camera" editing. If an image is on a card, it will be copied to the server.

The raw file volume is subdivided into a series of folders, named *Raw##-mm-yy*. (e.g. *Raw01-01-04, Raw02-01-04,*

Raw03-02-04). This sequence ensures uniqueness of the folder name. We reset the folder number *(##)* to *01* on January 1. Each folder is limited to 650 MB. If the images on a card force the folder size above 650 MB, a new folder is started *(Raw ##+1-mm-yy)*. We try not to split an assignment between folders.

The images in the raw file folders are written monthly to CD, and the images on the server are deleted. The CDs are labeled with the corresponding folder name *(e.g., Raw##-mm-yy)*. This is usually done two months after the images are taken; May's images, for instance, are written to CD in July. This is probably one of the most important image database management tasks we perform. Regardless of the amount of hard drive storage you have, eventually that space will be filled. A plan for the removal online images is vital.

Cataloging (the First Cumulus Catalog)

All camera files from the server volume *Raw Files 2004* are cataloged in a single Cumulus catalog named *Raw Files 2004* (We also have catalogs *Raw Files 2003* & *Raw Files 2002*.) We have forced Cumulus to make larger than normal, 512x512 pixel, thumbnails (Catalog - Properties - General - Thumbnail Size 512). It is easy to do a first-image edit with thumbnails of this size (Figure 1).

Captioning

After cataloging, file annotation information is added to the Cumulus caption field (Figure 2). Cumulus 5.5 writes the captioning information back to the file's IPTC (International Press Telecommunications Council) header. The captioning information actually becomes a part of the file, travels with the file, and is accessible through Photoshop (File - File Info) (Figure 3). Consequently, images sent electronically to editors or designers will have captioning information available. This is a major advantage of Cumulus. Since the captioning information travels with the image file, the possibility of incorrectly labeling
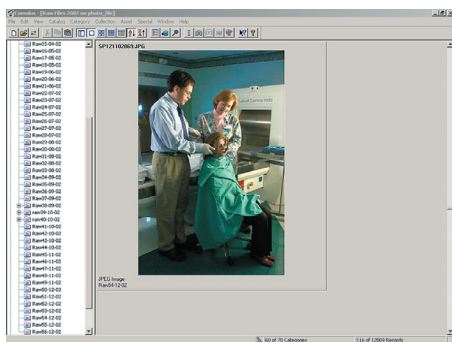

Figure 1 *The large 512x521 pixel thumbnail is large enough (in most cases) to allow for an image edit. The image is labeled SP121102069; a special procedure photograph made December 11, 2002.*
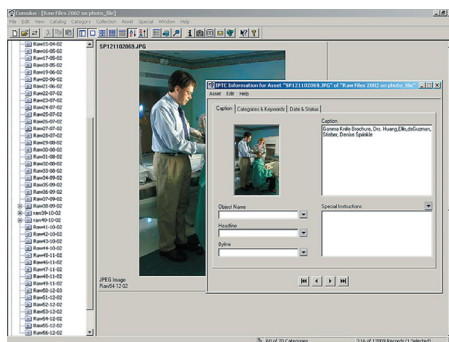

Figure 2 *Cumulus Caption field is shown with caption added. Cumulus writes this information back to the file's IPTC header. In addition to caption information, it is also possible to save information related to credits, bylines, caption writer, copyright, date/time, and location in the IPTC header. We use only the caption field.*
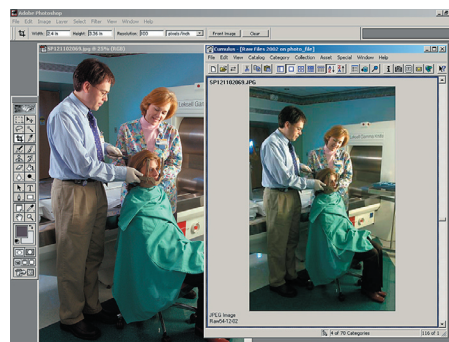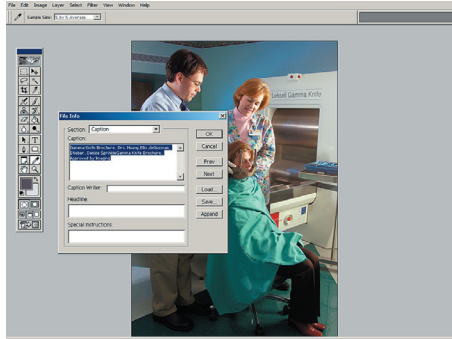

Figure 3 *Cumulus is opened over Photoshop. Dragging the thumbnail from Cumulus to Photoshop opens the file in that application. The Cumulus thumbnails are large enough to perform a rough edit. Final edit decisions are made from the files opened in Photoshop.*

image content is significantly reduced.

The caption is a searchable Cumulus field. This information, combined with the categories contained in the file name, allows for an easily searched database.

Working Volume Files

Figure 4 Photoshop is able to read the IPTC header. File - File Info displays this information.

The raw file catalog is opened over Photoshop (Figure 4). The Cumulus thumbnails are large enough to allow for a rough image edit. Dragging a thumbnail from Cumulus to Photoshop opens the original file ("asset" in Cumulus parlance). Final image selections are made from those files opened in Photoshop.

As soon as the edit is complete, selected images are saved as .psd files to the working volume of the server into one of the following folders:
• *Digital Images to be Cataloged* (brochure and other publication photos)
• *Digital Infinity to be Cataloged* (grip and grins)
• *Group Photos to be Cataloged*

Standard image correction routines are applied to the saved photographs. These images reside here until they have been used for their primary purpose. Usually, the images are used within a month.

Archive Volume Files

The "to be cataloged" folders are swept monthly. All the images that have been used for their primary purposes are opened in Photoshop, flattened, and saved as JPEGs in a corresponding set of folders *(Image Archive, Infinity Archive, Group Photo Archive)* on the archive volume of the server. Each of these folders has a matching Cumulus catalog, which is also updated monthly. These catalogs are set to capture the caption information in the image's IPTC header. Only the image archive catalog requires any additional work. These photographs receive a more complete categorization (Figure 5). Table 2 provides a list of our categories.

As department archivist, I am the only one with write rights to the archive volume. All others within the department have read-only rights. This limitation prevents accidental overwriting of archived images.

Summary

Since a relatively high percentage of photographs taken today are electronic, a different strategy must be used for storage and retrieval of these images than that which was used for their silver-based counterparts. Archiving software, such as Cumulus, allows for the creation of databases to help facilitate the management of these digital assets.
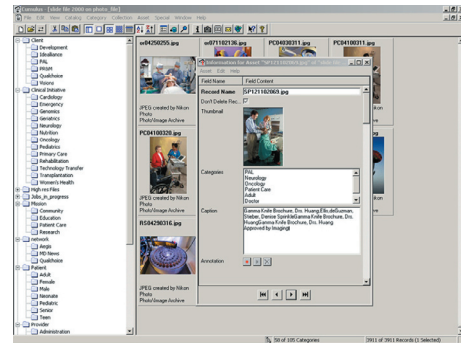
Figure 5 This screen grab is of the image archive database. The right portion shows the Cumulus asset information screen. Notice that the database is set to capture IPTC captioning information. The asset information screen also displays those categories that are unique to this image. These categories are chosen from the complete category list shown on the left (see also in Table 2).

Client	Mission	Provider
Development	Community	Administration
PAL	Education	Allied Health
PR&M	Patient Care	Chaplin
Qualchoice	Research	Clerical
Visions	**Network**	Dentist
Clinical Initiative	Aegis	Doctor
Cardiology	Qualchoice	Nurse
Emergency	**Patient**	P.A.
Geriatrics	Adult	Ph.D.
Neurology	Female	Technician
Nutrition	Male	Volunteer
Oncology	Neonate	**Student**
Pediatrics	Pediatric	Graduate
Primary Care	Senior	Medical
Rehabilitation	Teen	Resident
Technology Transfer		Undergraduate
Transplantation		
Women's Health		

Table 2 Cumulus Categories.

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