Abstract

This paper is an overview of dental digital asset management, discussing the processes of downloading, browsing, organizing, categorizing, rating, keyword usage, exporting, and backing up digital assets, all utilizing Adobe’s Photoshop Lightroom software. Future articles will discuss the technical “how-to” aspects of the software.

INTRODUCTION

Photography in dentistry has increased dramatically over the past ten years, especially since digital cameras have become a standard tool used in many dental offices today. Dental photography is used for documenting clinical cases, patient education, dental education, laboratory communications, and marketing. Many books and papers have been written about camera selection, clinical techniques, and implementing dental photography into the daily dental workflow. This paper will describe the digital asset management (DAM) required after the images are captured utilizing Adobe’s Photoshop Lightroom (Lightroom) software, a product built specifically for photographers.
DIGITAL ASSET MANAGEMENT

Digital Asset Management (DAM) refers to the organization and workflow of digital images (called assets). DAM involves importing images into a computer, organizing them so they are easily found, and outputting selected images to various mediums in order to share them with a particular audience. A doctor may want to email images of anterior veneer restorations captured during a try-in to their dental laboratory, enabling the technician to see how the case appears in the patient’s mouth. Or, a doctor may want to output images of selected finished cases to an iPad or other electronic device to show new patients examples of their work. Other images may be used for marketing on a website or on Facebook. Dental educators may want to gather and organize hundreds of images to present a particular case or technique to an audience at a dental meeting.

THE DILEMMA

There is a lot of confusion for many dental practitioners regarding how to manage digital images. Since digital photography is a relatively new field, (digital SLR cameras really took off in 2002 with Nikon’s introduction of the D100) most dentists are not trained as professional photographers nor do they keep up with the most current advances in this area. Hence many doctors are using dated software technology with limited workflow capabilities. As the demand for dental images increases daily, it is imperative for dental practitioners to be able to perform this task easily and efficiently.

Software bundled with many digital cameras is limited in features offered, and most do not allow for precise image organization and editing. Most are considered “browsers” which allow the user to browse the captured images and have limited output potential as well.
Even worse is trying to use proprietary dental management software (Dentrix, Softdent, Dental Mac, etc) with images captured from a digital camera. Dental management software packages do not function as browsers or image editors. They are not designed to store high quality digital images in various file formats (such as TIFF and RAW), nor will they allow the doctor to find images easily. In addition, adding thousands of images into dental management software will significantly slow down the server. Imagine trying to find completed single tooth implant supported restorations; the doctor would have to recall the names of every patient treated with a single tooth implant! This would be a task not worth performing.

Software packages such as Adobe Photoshop and Adobe Elements, are specifically designed for image editing and were not designed for browsing, sorting, and sharing images. They are great for creating unique layered images with complete, pixel-level control. They are fairly expensive and have a steep learning curve, which is too time consuming for most dental practitioners to undertake; plus the doctor would still require a browser to view the images.

Enter Lightroom (released February 19, 2007) and Apple’s Aperture (released in 2005). Both programs are similar in the fact they are both browsers and image editing software in a single package. The reason I personally chose Lightroom over Apple’s Aperture, is that Lightroom works on both Apple and PC platforms, whereas Apple’s Aperture only works with Apple computers. Since I teach digital photography workshops to dentists I must use software that applies to both Apple and PC platforms.

Adobe® Photoshop® Lightroom®

Lightroom is a professional photography software package with features appealing to the most discerning professional photographer.

LIGHTROOM IS THIS AUTHOR’S SOFTWARE OF CHOICE FOR THE FOLLOWING REASONS:
- Cross platform capabilities
- Designed by photographers for photographers
- Non-destructive editing
- Powerful cataloging and image editing abilities
- Works with RAW, Jpeg, Tiff, and PSD, file types
- Output to e-mail, web, slideshow, and print
- Can use on multiple machines
- Complete digital asset management package; nothing else to buy
- Relatively inexpensive
- Moderate learning curve

A key point to understand about Lightroom is that it is cataloging software. It does not physically import (move) images into the software. Images are downloaded from the compact flash card onto the user’s hard drive to a predetermined location (a folder named dental images for example). Lightroom recognizes where the images are and builds a data catalog. The software never moves or alters the original images. The user can store them physically anywhere (internal or external hard drive.) However, if the images are moved from their original location, Lightroom will not be able to find them until the user tells Lightroom the new location. This is a wonderful feature since the images are protected and preserved in their original state.

LIGHTROOM INTERFACE

The interface is divided into three main panels; The left panel shows the hard drive (where all the images are stored) and contains all the patient folders. The center panel is the main viewing window. When a particular patient folder in the left panel is selected, the main panel displays all of the images in that folder as thumbnails. The right panel contains data pertaining to an individual image (called metadata). Additional information (such as key-wording, ratings, copyright info, etc.) can also be added to the image(s).
**LIGHTROOM MODULE PICKER**

The Lightroom modules are setup to follow a photographer’s typical workflow:

- **Library**: Images are organized, sorted, key-worded
- **Develop**: Non-destructive image manipulation
- **Map**: Add GPS coordinates to images
- **Book**: OUTPUT
- **Slideshow**: OUTPUT
- **Print**: OUTPUT
- **Web**: OUTPUT

**DENTAL DIGITAL WORKFLOW**

1. **Importing Images**

   Images are transferred from the CF card and sorted into specific patient folders. Images can be stored on the main hard drive or an external drive. Clicking on a folder brings up all the images for that patient. The images can now be browsed and evaluated.

2. **Selecting the “best” images**

   While browsing the images can be enlarged or compared side by side or in a group. Images can also be “flagged” which tags them as “selected” images to be used at a later date. They can also be arranged in any order the user chooses. Once all the best images are selected and flagged, Lightroom allows the user to view only the flagged images, showing only the best images for this particular patient.
3. Keywording

A huge challenge in managing numerous dental images is finding the exact one you’re looking for right when you need it. The solution to this is keywording. Adding user-defined keywords to images makes finding them later on extremely simple. One or more keywords can be assigned to an image, and keywords can be added, removed, or changed in the future. For example, an image depicting a single tooth implant may have the following keywords: implant_single tooth, custom abutment_zirconia, Biomet 3i. Searching the keyword “implant_single tooth” will bring up every image tagged with that keyword. Multiple attributes can also be applied to a search: such as “custom abutment” and “flagged.” This search would show the best custom abutment images, filtering out the undesired ones.

4. Metadata

Metadata means “data about data.” It provides information about an image’s content. For example, an image’s EXIF metadata (exchangeable image file format) contains the file name, file dimensions, date and time information, camera settings, camera make and model, shutter speed, aperture, lens information, ISO settings, and many other parameters. Every digital image taken from every digital camera contains metadata. Lightroom allows the user to edit some of the metadata as well as search for particular items. For example a doctor may want to view all the images taken on a certain day. Or he may want to view every image taken with a particular camera. All of the metadata fields are searchable.

Additionally, the user can add metadata to an image. This may include the user’s name, contact information, copyright status, labels, captions, etc. This is useful especially if images are to be given to a third party; they are now tagged with the owner’s detailed contact information.

DEVELOP

The develop module allows the user to modify the image non-destructively, meaning that any changes made to the image are reversible. With respect to the field of dentistry, the only changes that should be made to an image are global corrections (overall exposure, contrast, etc., and cropping. Specific pixel based modifications are not acceptable for images that are to be used for publication or lecturing.

OUTPUT

Now that the best images are organized, selected, keyworded, and cropped, Lightroom allows the user to output the images to a multitude of ways. Collections can be made for a particular case or for a patient presentation or lecture. Think of a collection as a virtual digital scrapbook, containing just the best images you want to show. You may want a collection for a particular patient showing detailed images of the case from start to finish. Or you may want a collection for anterior implant cases. The possibilities are limitless. The collections can be shown as a slide show, exported for e-mail, printed, or even uploaded to a website, a Facebook page, or an iPad. The ability to output images to design and print a book is also possible. All of the above is possible regardless of the file type (RAW, TIFF, jpeg, etc) due to Lightroom’s ability to handle any current file type with ease.
Below is a collection of laboratory items made from selected images.

CATALOG BACKUP

Lightroom automatically backs up its catalog and its preview images of your actual images as you exit the program. It does not backup your original images (stored wherever you decide to store them) which should be automated daily using specific software for that purpose. I use an external drive which is stored off-site from my dental office.

SUMMARY

This paper was written to show doctors the current state-of-the-art in dental digital asset management using a single software package, Adobe Photoshop Lightroom 4. The software will make digital asset management simple and fun, as well as allowing the dental practitioner to easily use the images in a multitude of ways.

BREAKING NEWS

In March 2012, Adobe released the newest version of Lightroom, Adobe Photoshop Lightroom 4. I had been using the beta version of this software for weeks and can report it’s a much improved product over version 3. Key new features include the ability to produce photo books, emailing within Lightroom (finally!) additional editing brushes, extended video support, video publishing, soft-proofing, enhanced online sharing integration, and many other features. Future papers will describe in detail how to use this software in a dental digital workflow.

Please note the below advice before using any photo software:

- If your workflow is working for you DO NOT CHANGE IT
- Never experiment with your original data
- Backup all data BEFORE upgrading or using new software
- If you want to try a new workflow do it with sample files and test folders
- Download the trial version of a particular software and evaluate it before purchasing
- Research online user comments and opinions

Dental Digital Photography Workshops

DR. GOLDSTEIN IS AVAILABLE FOR DENTAL DIGITAL PHOTOGRAPHY WORKSHOPS.

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