NGA
Digital Imaging
Program

NARA 2007
Alan Newman, Chief, DIVS (Digital Imaging & Visual Services)
National Gallery of Art

The Division of Imaging and Visual Services (DIVS) assists all NGA offices with official needs for digital image files and prints.

The Digital Imaging Program

DIVS has provided the infrastructure and technical leadership for the NGA to convert photographic systems from film-based, chemical processes to digital image capture, storage, retrieval and preservation. DIVS has adopted basic practices and guidelines for digital imaging production, management and archiving derived from

- RLG (Research Libraries Group)
- UPDIG (Universal Photographic Digital Imaging Guidelines)
- NISO (National Information Standards Organization)
- NARA (National Archives and Records Service)
- ICC (International Color Consortium)

DIVS uses industry standard color management systems to insure quality control over display devices, scanners, cameras and printers. The production environment enables a closed-loop RGB color work flow wherein "use-neutral" high-resolution master files spawn a variety of derivative files directed to specific output systems including local printers (e.g., ink-jet and laser printers), analytic and general-purpose computer monitors, and pre-press lithographic systems.

Digital Imaging Program Documentation

- DIVS Work Order Vision Prototype 2006 (pdf)
- Digital Media Strategies Task Force Report 2002 (pdf)
- NARA Guidelines for Digitizing Archival Materials 2004 (pdf)
- Understanding Digital Raw Capture 2005--B. Fraser (pdf)
- ITSC Presentation 2006 (pdf)
- DIVS Data Dictionary for Collection Images (xls)
- Multi-spectral Imaging Report (pdf)
- Digital Archiving Conference--May 2007 (pdf)
- Best Practices Digital Image Workflows UK (pdf)
- UPDIG Universal Photographic Digital Imaging Guidelines v2.0 (pdf)
- Digital Image Asset Management at the National Gallery of Art (US) (pdf)

The need for this program has been validated by the NGA Information Technology Steering Committee (ITSC) and by the Gallery Executive Officers.

The assumptions made regarding the pursuit of this digital imaging program are as follows:

- DIVS plays the central role in the production and access to authoritative, publication-quality digital images of the Gallery's collection and Gallery events.
- The Gallery continues to develop image acquisition resources in every department where there is a business need for quick digital capture.
- DIVS acts as a technical overseer and advisor to develop Gallery-wide standards and best practices for departments that have the need to do their own specialized image acquisition.
- The Digital Imaging Program will be adequately funded to ensure an appropriate technical approach and adequate technology infrastructure.
- Gallery processes surrounding the acquisition, management and use of images will be reengineered to become more efficient.

NGA
Digital Imaging
Program

- A suite of image management applications, resources and production capabilities

- Gallery-wide best practices for imaging

- Education and training for producers and requesters of digital images

DIVS
Digital Imaging & Visual Services
National Gallery of Art

2004-05

- Full direct digital capture of works of art. Ceased shooting film.
- Digital printing lab replaced b/w & E-6 darkrooms
- Full color-managed workflow
- Adopted pre-press publishing in-house
- DAM software deployed (Portfolio SQL)
- Presented need for comprehensive digital preservation policies for NGA
- Realignment of products and services
- Photoshop training for museum professionals

2005-06

- Collected requirements for Image Work Order software for deployment in 2007
- Established need for Enterprise Digital Asset Management (EDAM) system to eliminate redundant storage of images and streamline access and delivery of image derivatives
- Conducted comprehensive study of rights and permissions needed, granted and requested leading to IP & DRM requirements definitions

Equipment

- Sinarback 54H
  - Sensor resolution: 5440 x 4080 pixels
  - Used for primary objects
- Broncolor electronic flash
- Canon 5D and Canon 1Ds Mark II
  - Small objects and high volume

Methodology

- Use-neutral image archive
- Archive Raw, Layered & Flat Tiff
- Quality assurance
  - False color corrected locally
  - Screen/print match to original
  - Measure CIE Lab values + appearance acceptance by stakeholder

Digital Camera

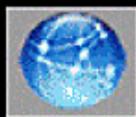Original Painting

Slide from film recorder

1. RGB_parent_file.tif
2. Raw Hi-bit File

Laserprint

http://www

file.jpg

Server

InkJet Prepress Color Proof

NATIONAL GALLERY OF ART
Collection Management System

Collection Management

JPEG 2000 file

InkJet Archival Print

Network pan/zoom

Animation and Video

Photorealistic Dye Print

Use-neutral Workflow

Use ~~Neutral~~ Specific

- Conservation documentation and scientific analysis (new Mellon Imaging Scientist)
    - Radiography, UV Fluorescence, IRR
    - Multi-spectral imaging under development

- Fast capture projects for asset discovery
    - Web use and good to modest print quality
    - Global color editing
    - High-volume, low-cost
    - Egalitarian

IMAGE CAPTURE THROUGHOUT NGA

- There are more than 200 scanners and digital cameras used outside DIVS for NGA imaging. Examples:

  -Curators shoot art for lectures and research on trips and in storerooms.

  -Education shoots images to for web

- No standardization of file types and sizes, color management, labeling or storage.

Goals
image capture outside DIVS

- Embrace decentralized image capture
- Provide comprehensive education to achieve
  - economies of scale
  - preservation
  - best practices for capture, image metadata and color management
- Build EDAM to manage these images
- Use UPDIG guidelines as starting place for image production and preservation practices

www.updig.org

Universal Photographic Digital Imaging Guidelines

These 12 guidelines aim to clarify the issues affecting accurate reproduction and management of digital image files. The guidelines have three primary goals:

* Digital images should look the same as they transfer between devices, platforms and vendors.
* Digital images should be prepared in the correct resolution, at the correct size, for the device(s) on which they will be viewed or printed.
* Digital images should have metadata embedded that conforms to the IPTC standards, thereby making the images searchable, providing usage and contact information, and stating their creators or copyright owners.

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1. Color Management
   Using and embedding ICC color profiles
2. Monitor Calibration
   Hardware calibration and profiling; monitor soft-proofing
3. Color Spaces
   Camera settings; image editing; offset printing; CMYK
conversions; photo lab prints
4. File Formats
   Camera RAW; DNG; formats for the web; formats for
print
5. Naming Files
   Cross platform compatibility; avoiding duplicate file
names
6. Resolution
   How to describe; optimizing for the screen; for inkjet
prints; for continuous-tone printing; for offset printing

7. Sharpening
    Capture sharpening; process sharpening; sharpening tools; dealing with noise; output sharpening
8. Metadata
    IPTC Creator and Copyright; keywords; the importance of metadata
9. File Delivery
    Media; methods; file info; ReadMe files
10. Guide Prints and Proofs
    Print and proof viewing
11. Archiving
    Who; what; where
12. Workflow
    Matching to needs; what it should do; choosing the right tools

UPDIG Members

Photographers*	American Society of Media Professionals
Museums*	Museum Computer Network
Image Agencies*	American Society of Picture Professionals
Photojournalism*	National Press Photographers Association
Software Vendors†	Microsoft, Adobe
Camera Vendors†	Sinar, Canon
Publishers*	Time Warner

*Board Members   †Advisory Council

AOP
Association of
Photographers (UK)

APA | ADVERTISING
PHOTOGRAPHERS
OF AMERICA
Advertising Photographers
of America

asmp
AMERICAN SOCIETY OF
MEDIA PHOTOGRAPHERS
American Society of
Media Photographers

aspp
American Society
of Picture
Professionals

blf
Professional
Photo
Companies
and Photo
Agencies
Association
(Sweden)

CAPIC
Canadian Association of
Photographers and
Illustrators in Communication

ep
Editorial
Photographers

hkipp
Hong Kong Institute of Professional Photographers
Hong Kong Institute of Professional
Photographers

IDEAlliance®
International Digital Enterprise Alliance
International Digital
Enterprise Alliance

Museum
Computer
Network

www • fotografi • org
**associazione
nazionale
fotografi
professionisti**
National Association of
Professional Photographers
of Italy (TAU Visual)

NPPA
NATIONAL PRESS PHOTOGRAPHERS ASSN.
National Press
Photographers
Association

PACA
Picture Archive
Council of America

PLUS
Picture Licensing
Universal System

PPA
Professional Photographers of
America

SAA
Stock Artists Alliance
Stock Artists Alliance

ImageMuse

ImageMuse is a discussion group of museum imaging and publishing professionals dedicated to defining common language and specifications concerning the use of digital files for reproduction.

Art Institute of Chicago	Boston MFA
Dallas Museum of Art	Guggenheim Museum
J. Paul Getty Museum	LACMA
Metropolitan Museum of Art	MOMA
National Gallery of Art (US)	National Gallery of Canada
UC Berkeley	Victoria and Albert Museum (UK)
Wesleyan U.	

Premise: catalog reproduction is problematic using digital files received from unfamiliar sources without embedded profiles and/or guide prints.

ImageMuse participants will work together to arrive at a common format that can be widely adopted by museum publishers and printers. ImageMuse hopes to reduce the level of effort for publication proofs and elevate image quality.

EDAM Requirements

- Mass ingestion digital files
- Robust relationship between images and image metadata
- Explicating relationships between files (i.e., derivative of or part of larger whole)
- Managing Intellectual Property rights to the file
- Managing permission levels of access to files
- Integrating with other systems (e.g. CMS)
- Exporting assets and descriptive metadata in XML

EDAM REQUIREMENTS

- Boolean searching for digital files
- User-defined reporting capabilities
- Workgroups across divisions can access image-based reports for exhibitions, publications and other projects
- Users make color managed prints with customized captions using any combination of data fields
- Slide show capability--multi-image comparisons
- Pan-zoom images to inspect detail
- Document the provenance of digital file
- Convert and export digital files into different formats, color spaces and sizes