Introduction

Digital Imaging for Records

Digital Imaging Defined...

- The conversion, storage, and distribution of information displayed but not directly modified by a computer...
GUIDELINES & ADVICE...

- Advisory *not* requirements
- Based on:
  - national technical standards
  - established practices
  - research
- Critical issues to consider...
- Especially important for systems used for mission critical records...

- Public officials are responsible by law for ensuring that their records are protected and accessible *regardless of the media involved.*

PART OF A LARGER RIM PROGRAM...

- A records imaging project should be a component of a broader, comprehensive records and information management program...
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PROJECT PLANNING

THE “BASICS”

- Part of your more, all encompassing RIM program...
- Multi-disciplinary Imaging Team...
- Conduct business analysis & cost justification...
- Set realistic goals & timelines...
- Develop RFI/RFQ/RFP...

Just the basics, please.
Prior to selecting a digital imaging system, conduct a workflow and records analysis:
- Opportunity to reengineer business process for operational efficiency...
- ID & document existing and planned agency information needs...
- Determines which records are best suited for imaging...

Conduct a cost benefit analysis to justify system purchase / outsourced services...
Compare the costs of your current operation with the costs of the new system...

http://www.machsoftware.com
COST JUSTIFICATION

- Consider
  - File creation, maintenance, disposition
  - Potential changes/improvements
  - Proposed system architecture
  - Equipment pricing
  - Financial measures (ROI)
  - Analysis tools available at ERC’s Web site

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TECHNICAL SPECIFICATIONS & SELECTION
OPEN ARCHITECTURE

- Require open system or require developers to provide a bridge
  - Flexible upgrades without
    - Additional costs
    - Minimal function loss
    - Major risk of losing records
  - Bridge to non-proprietary standards
    - Allow access from and transfer to other systems

NON-PROPRIETARY FORMAT

- Use a non-proprietary digital image file format or provide a bridge
- No single industry-wide image format standard
  - Tagged Image File Format (TIFF)
  - PDF/Archive (PDF/A)
  - JPEG2K
  - PNG
**COMPRESSION**

- Lossless - a bit for bit recreation of original image...
- Lossy - a sampling of the image that “tosses” out actual bits leaving a distorted recreation of original image...

**NON-PROPRIETARY LOSSLESS COMPRESSION**

- Black & White
  - TIFF w/Group IV (Group III for fax machines)
  - JPEG2K
  - PDF/A
  - PNG

- Grayscale & Color
  - TIFF w/LZW
  - JPEG2K
  - PDF/A
  - PNG
**SCANNING RESOLUTION**

- Storage requirements
- Throughput Rate
- Accurate reproduction
  - Textual Documents - B&W 300dpi for good quality images
  - Photos, maps, illustrations may need >300dpi and in grayscale or color

**ERROR DETECTION**

- Equipment conforms to standard error detection and correction methodology...
- System should provide techniques to verify records on digital media...
- System administrator should actively monitor the status...
**Verification**

- Verified at the point of writing to storage media...
  - ...via “Write and Verify” at the hardware level...
  - ...or at the software level
- If not feasible, your quality assurance procedures must be specified (e.g. viewing of documents downstream or spot checks of records as required)

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**Digital Image Metadata**

- ...is information about an individual datum or sets of data that is used to facilitate its understanding, use and management...

- Description = Ohio Statehouse
- File Name = ohio_statehouse_-_credit_rod_berry_capitol_square_review_and_advisory_board.jpg
- Creator = Unknown
- Dimensions = 3600pxx2400px
INDEXING DATABASE

- Should provide efficient retrieval, ease of use, and up-to-date information about the images stored
- Indexing methods include
  - Manual key entry
  - Match and merge
  - Targeted OCR
  - Barcode
- Should be selected after an analysis of agency operations and user needs

AUDITED PROCESSES

- Based on legal POV...
  - “Best available copy”
  - Audit trail to ensure that record has not been changed
  - Annotations as a separate “layer”
  - Records cannot be deleted once entered
  - Records cannot be directly accessed by the user--application is an abstraction layer
  - Optional use of non-rewritable media
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SYSTEM IMPLEMENTATION

TEAM ROLES...

- **Organization**
  - Project Manager
  - Decision Makers
  - Systems administrator
  - Train the Trainer
  - Users

- **Vendor**
  - Project Manager
  - Implementation Staff
    - Hardware
    - Software
  - Training
  - System Support
OPERATIONAL PROCEDURES

- Provide technical & administrative documentation to ensure...
  - Future usability of the system...
  - Continued access to long-term records...
  - Sound foundation for assuring the system's legal integrity...

OPERATIONAL PROCEDURES

- Written record of:
  - Procedures
  - Operating systems
  - Decisions & Changes
  - Updated on a regular basis
- Consistent with requirements for the admission of records under the rules of evidence laws
**IMAGE INTEGRITY**

- Institute procedures to ensure quality, integrity of scanned images
  - Visual verification at start of day
  - Inspection of images and system components to insure accessibility
  - Regular audits based on sample images

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**ARCHIVING & LONG-TERM MAINTENANCE**
**RECORD RETENTION REDUX**

- Retention and disposal of digital images and corresponding records should be incorporated into retention schedule
  - Store images so that they can be identified by that schedule
  - More than normal file delete may be required

**LONG-TERM DOCUMENTS**

- Specific plans for creating and sustaining digital images that will be retained more than 10 years
- Master image capture
- System information and maintenance
- Sustainability

Domesday Book
commissioned by William the Conqueror
completed 1086 and still accessible.
Original Digitization in 1986
inaccessible w/in 15 years
**DISASTER RECOVERY PLAN**

- Comprehensive records and information disaster recovery plan...
  - Identification of vital records
  - Off-site facilities (hot, warm, cold)
  - Periodic tests
  - Redundant recovery site

**BACKUPS**

- Design procedures to create secure copies of images and related index records
  - Regular audits to determine validity and completeness...
  - Ongoing testing to verify restore capabilities...
- Backups should allow for disaster recovery...
Technology is constantly changing—electronic records may not be stable, reliable, authentic and accessible over the long term, therefore...

- If retention > 10 years, you may need to plan for eye-readable backup (paper or microfilm)

Essential to avoid degradation and to facilitate long-term storage
- Copy data onto identical media
- Reformat data from obsolete storage device

Periodically
- w/in time specified by supplier
- as new storage devices are installed
- if audit discloses significant read errors
MIGRATION

- New software, platforms, file formats
  - Reformatting existing file formats to new ones
  - Migrating one component (e.g. database) to new hardware and/or software platform
  - Migrating the whole system from one hardware and/or software platform to another

MIGRATION

- Document the changes made to the hardware, software, and file formats
- Include changes that could affect data viability
**SUSTAINABILITY**

- System (hardware & software) could be operational 10+ years
- However, technology often superseded in 2-3 years

**ONGOING COSTS**

- Budget annually between 20-25% of original system acquisition cost for upgrades, training, maintenance
- If *not* factored into continuing support:
  - system can become obsolete
  - Would require costly outlay to restore effectiveness, if at all possible
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CONCLUSION