Scanning 101

UNIVERSITY OF CALIFORNIA

INFORMATIONAL SERIES

Discussion today

- How imaging works
- Pros and cons of scanning records
- Assessing your scanning needs

How imaging works

+ Scanned Documents
+ Born-digital Records
+ In a System to process and store records
+ Storage

= Electronic Imaging System

Imaging Steps

- Document Preparation
- Recording by Scanner
- Conversion to Digital Format (Image Capture)
- Compression

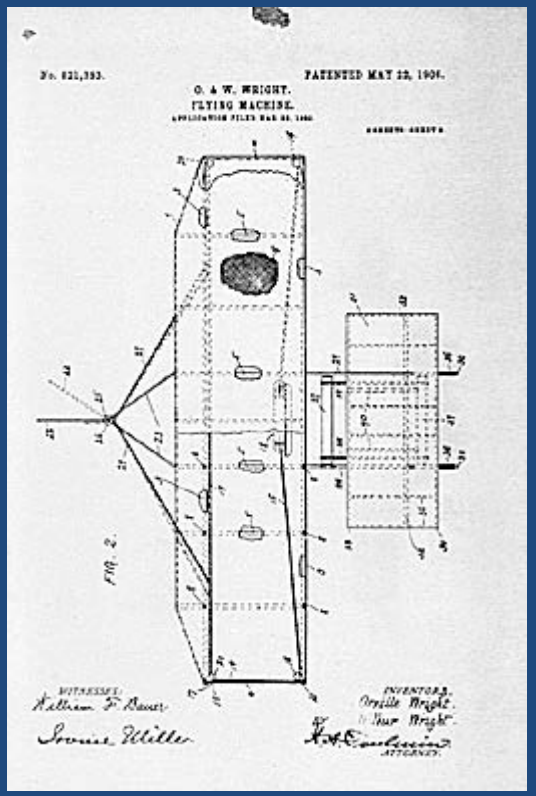
Sources: Information & Records Management and Records Management Handbook

Document Preparation

Documents

- Each page is imaged
- Document can be one image or many
- Each document is indexed, but pages must have some form of linkage
- User must “prep” documents

Patent; Wright Plane



Document Preparation

Most records today are created electronically, should not “image” these.

Good candidates for imaging:

- Clean paper in good condition
- Few shadings or multi-colored inks

Document Preparation

- Making the paper “scanner ready”:
  - Remove staples, paperclips and binder clips
  - Remove Post-it notes, or attach notes if you want to capture the information
  - Mount smaller records or substantive Post-it notes on letter-size paper with transparent tape
  - Photocopy difficult to read pages to get a better contrasting image
  - Repair torn pages
  - Straighten folded corners
- This is the most labor-intensive part of the process

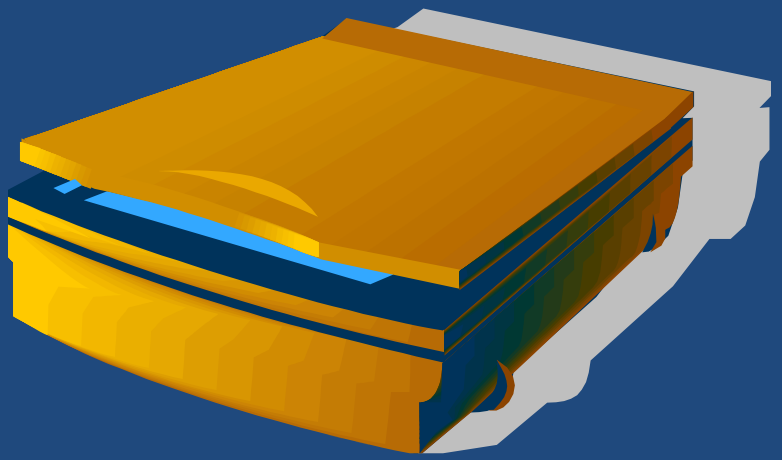
Sources: Information & Records Management and Records Management Handbook

Classify documents

- Before scanning to reduce manual routing and indexing costs
- Separate document types, forms, batches, duplex/simplex, and so on
- Patch codes
  - Standard or customized codes
  - Pasted on the first page of a document or a document batch
- Separator sheets
  - Standard or customized
  - Contain bar codes

Scanning documents

- Scanning or “Imaging” = a process of recording an exact image of a document to a digital image file.
- A digital image consists of pixels = picture elements or tonal values (blacks and whites – Os and 1s) in binary code arranged in columns or rows.
- The number of pixels per inch determines the image's resolution = clarity and definition of the image expressed as height by width in pixels for image files or as dots per square inch (dpi) for prints.



Sources: Information & Records Management and Records Management Handbook

National Archives and Records Administration, Frequently Asked Questions About Imaged Records
http://www.archives.gov/records-mgmt/faqs/imaged.html

Recording by Scanner

A scanner divides the image into pixels

Each pixel is assigned a digital value based on dark/light or color

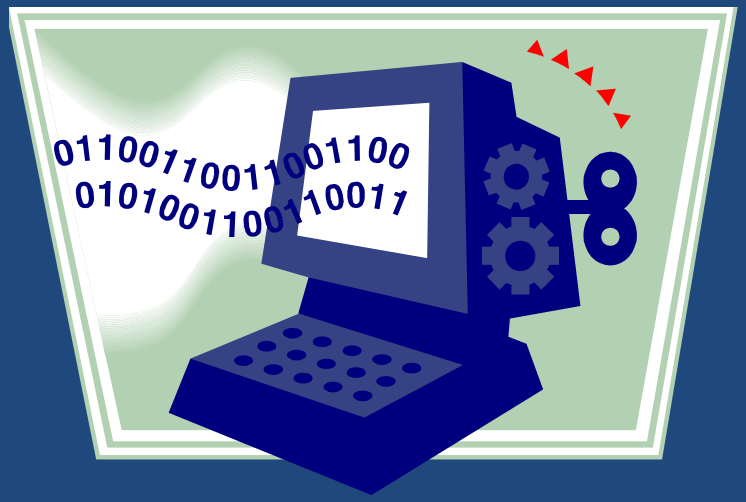
Once scanned

- The documents may be stored as simple raster images, or
- If they are text-based, they may be processed with optical character recognition (OCR) software so they can be manipulated as electronic text with full text search capabilities.

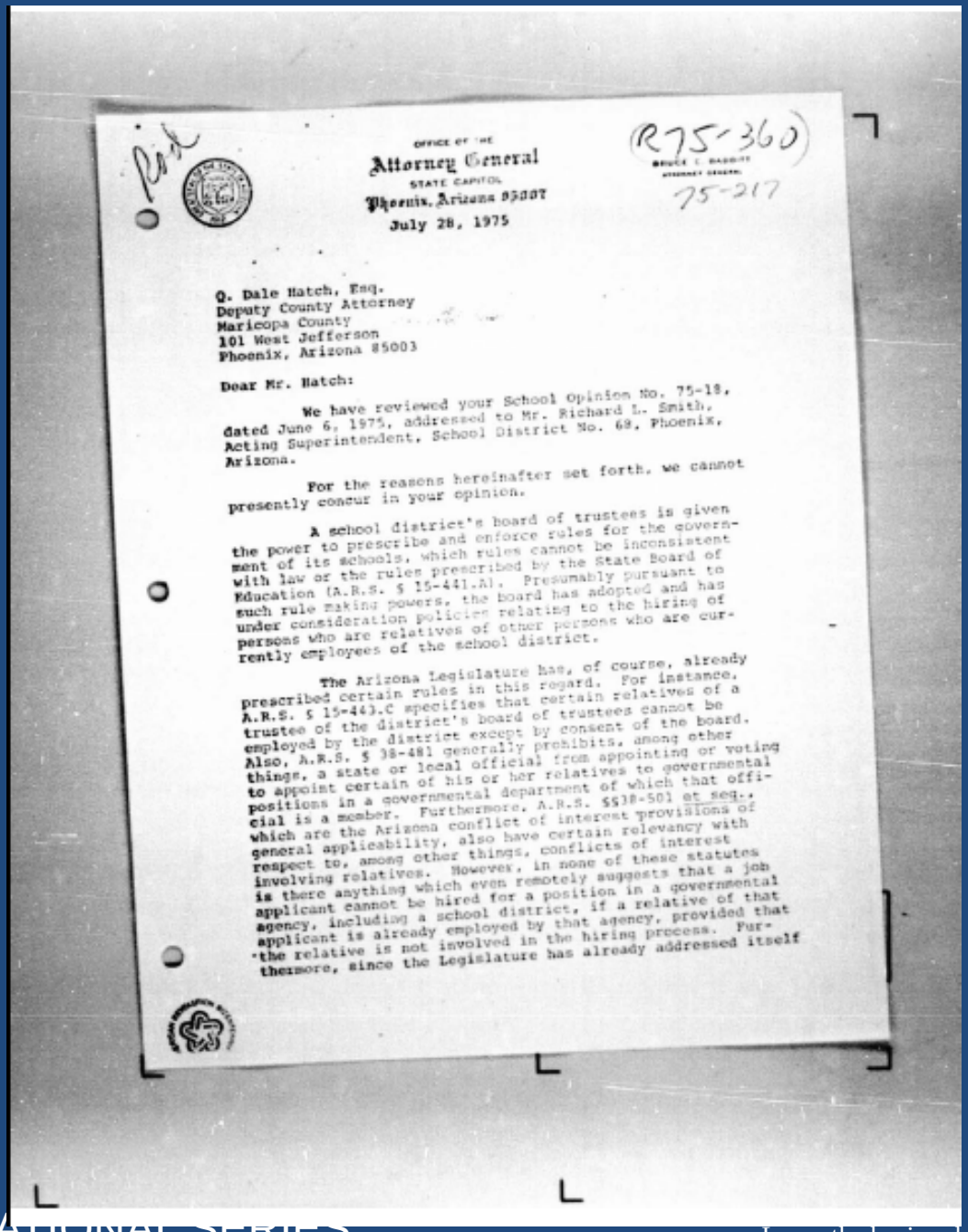
http://www.vendorseek.com/Deciphering-the-Differences-among-Digital-Imaging-Systems.asp

What does this mean?

- Raster - Usually pictures of documents
  - These pictures are stored as 1s and 0s



- OCR processed - Pictures of text can be transformed into letters that can be manipulated



OFFICE OF THE
Attorney General
STATE CAPITOL
Phoenix, Arizona 85007

July 28, 1975

R75-360

75-217

Q. Dale Hatch, Esq.
Deputy County Attorney
Maricopa County
101 West Jefferson
Phoenix, Arizona 85003

Dear Mr. Hatch:

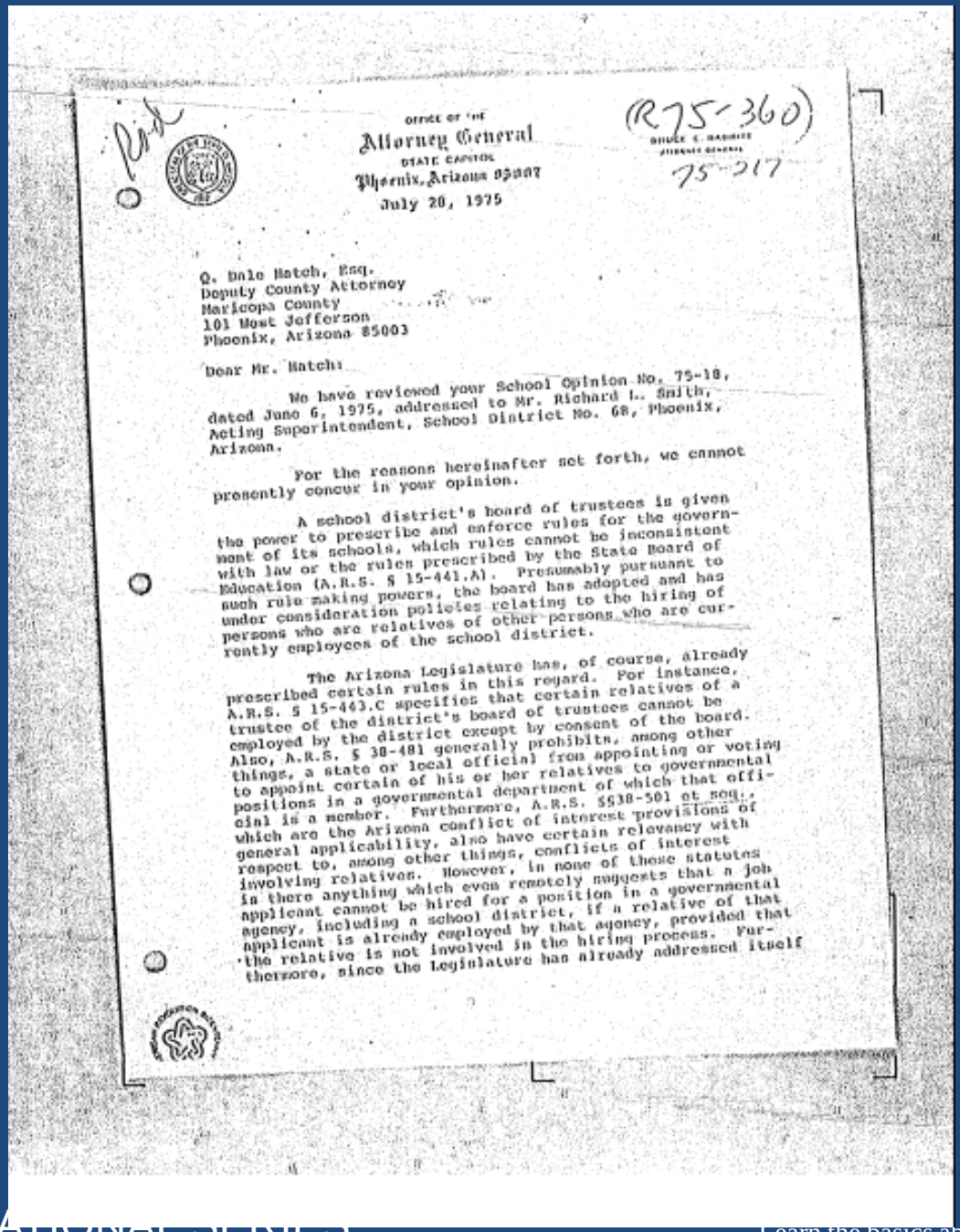
We have reviewed your School Opinion No. 75-18, dated June 6, 1975, addressed to Mr. Richard L. Smith, Acting Superintendent, School District No. 68, Phoenix, Arizona.

For the reasons hereinafter set forth, we cannot presently concur in your opinion.

A school district's board of trustees is given the power to prescribe and enforce rules for the government of its schools, which rules cannot be inconsistent with law or the rules prescribed by the State Board of Education (A.R.S. § 15-441.A). Presumably pursuant to such rule making powers, the board has adopted and has under consideration policies relating to the hiring of persons who are relatives of other persons who are currently employees of the school district.

The Arizona Legislature has, of course, already prescribed certain rules in this regard. For instance, A.R.S. § 15-443.C specifies that certain relatives of a trustee of the district's board of trustees cannot be employed by the district except by consent of the board. Also, A.R.S. § 38-481 generally prohibits, among other things, a state or local official from appointing or voting to appoint certain of his or her relatives to governmental positions in a governmental department of which that official is a member. Furthermore, A.R.S. §§38-501 et seq., which are the Arizona conflict of interest provisions of general applicability, also have certain relevancy with respect to, among other things, conflicts of interest involving relatives. However, in none of these statutes is there anything which even remotely suggests that a job applicant cannot be hired for a position in a governmental agency, including a school district, if a relative of that applicant is already employed by that agency, provided that the relative is not involved in the hiring process. Furthermore, since the Legislature has already addressed itself

Grayscale scan



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Bi-tonal scan

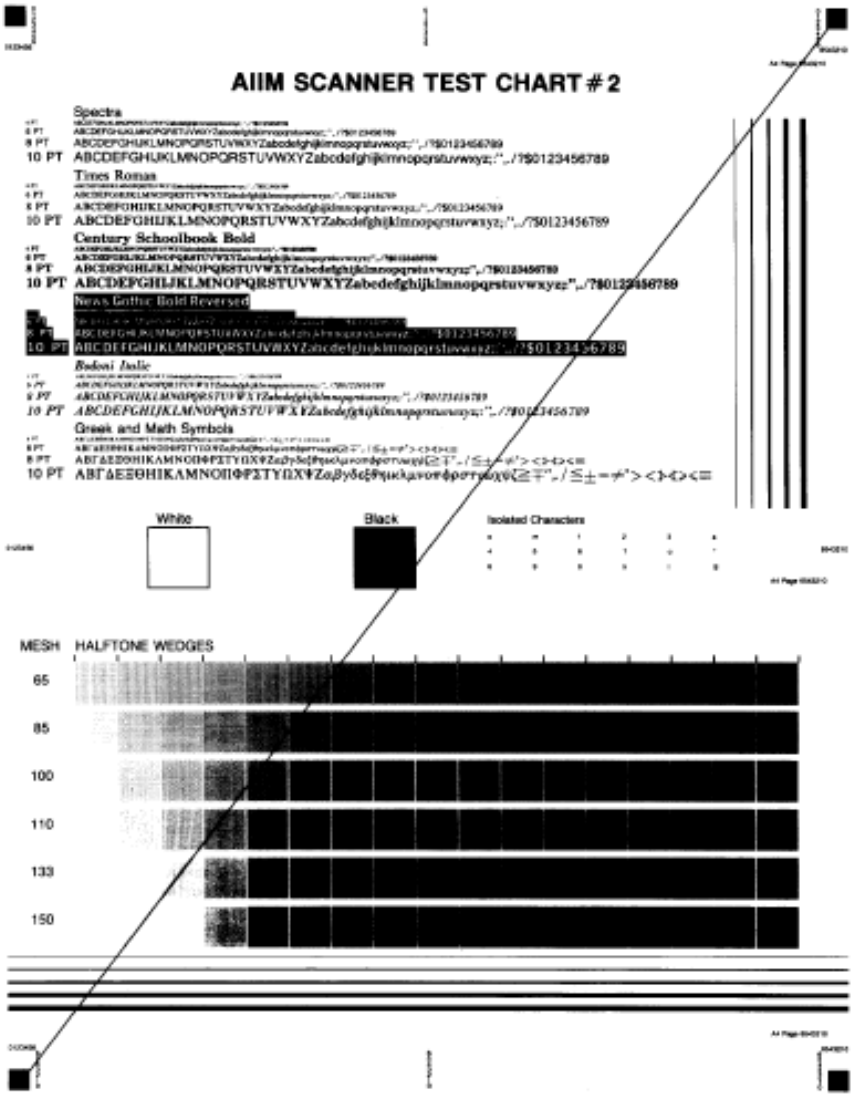
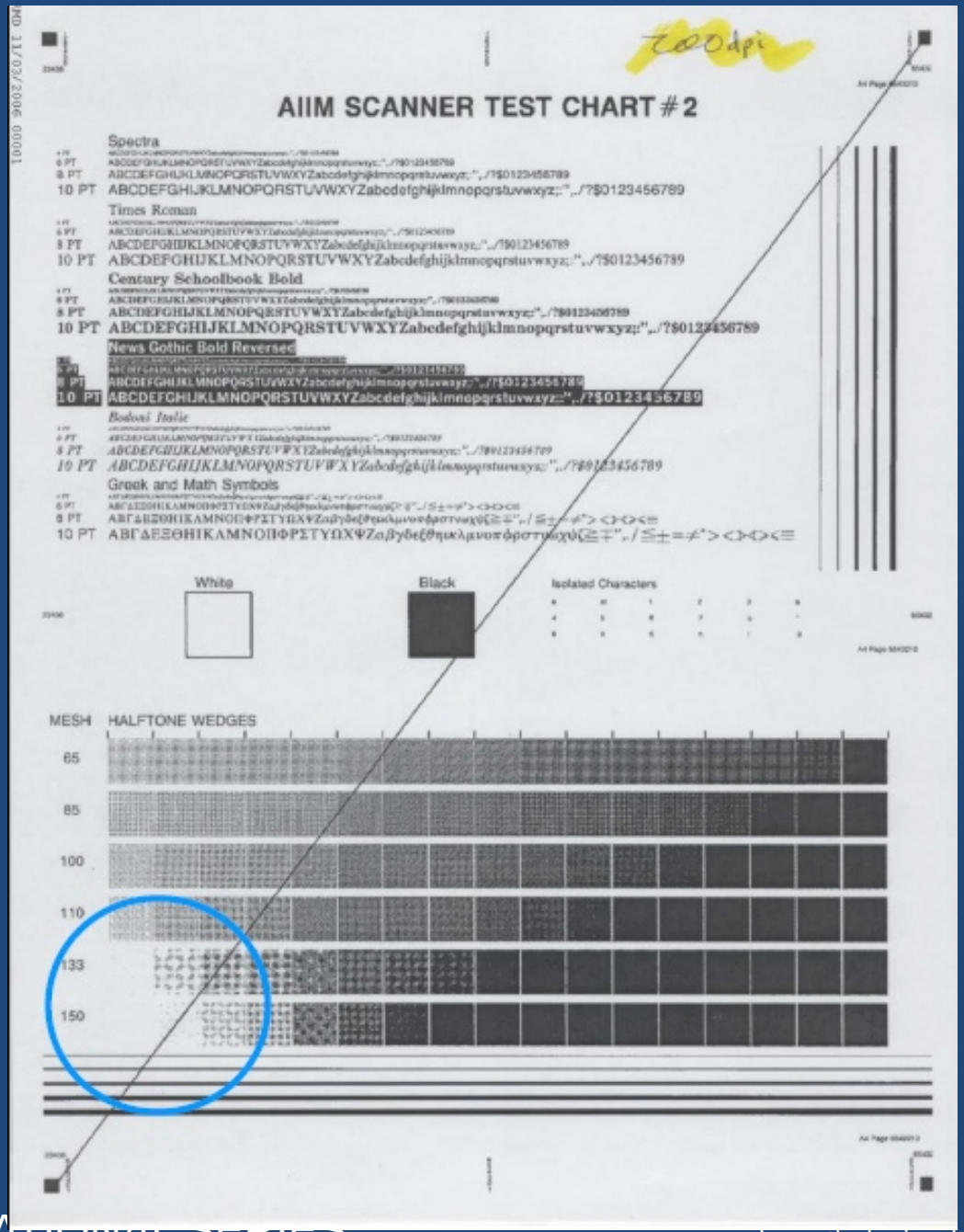


Figure 4. Reduced Copy of AIIM Scanner Target

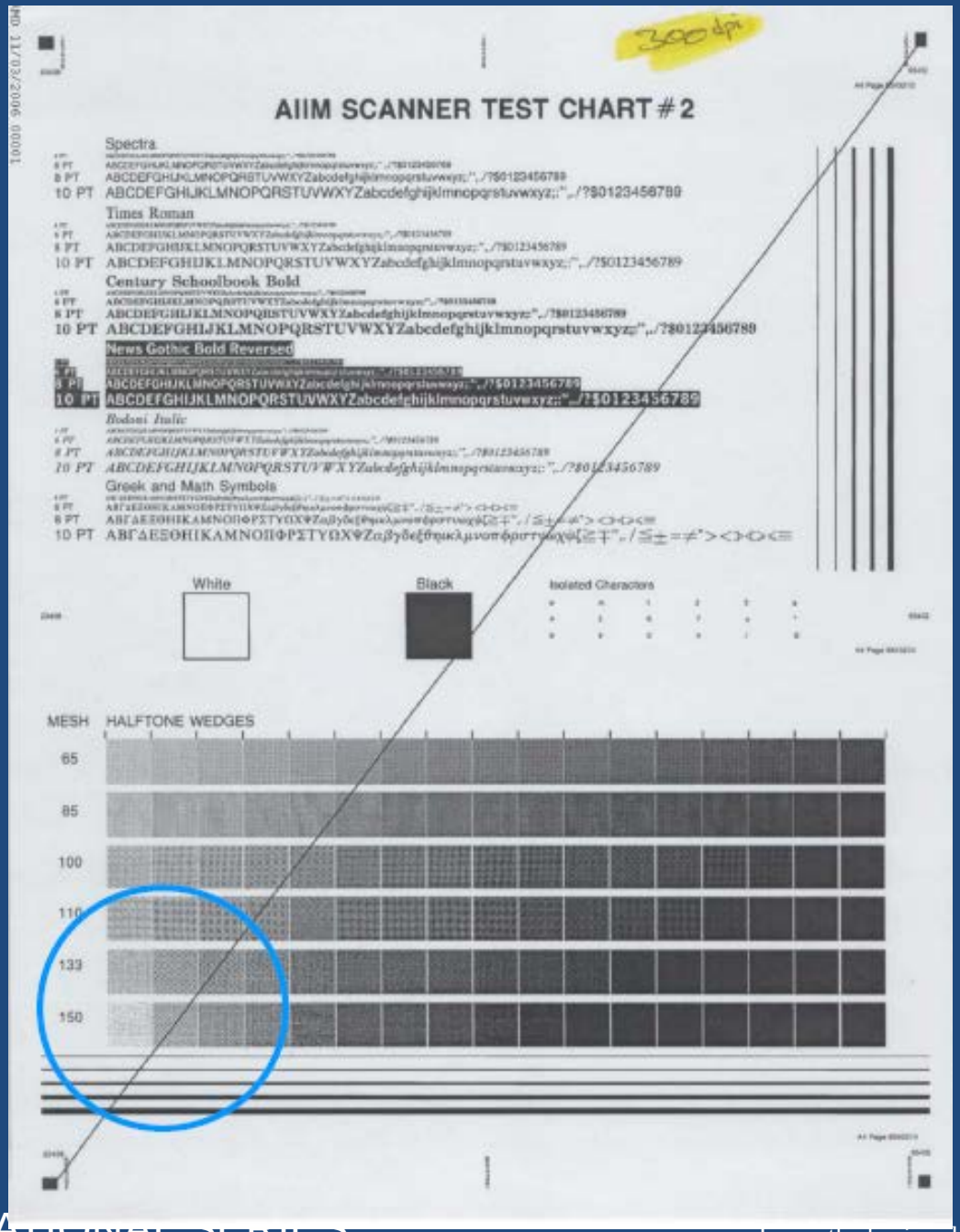
9

Bi-tonal scan



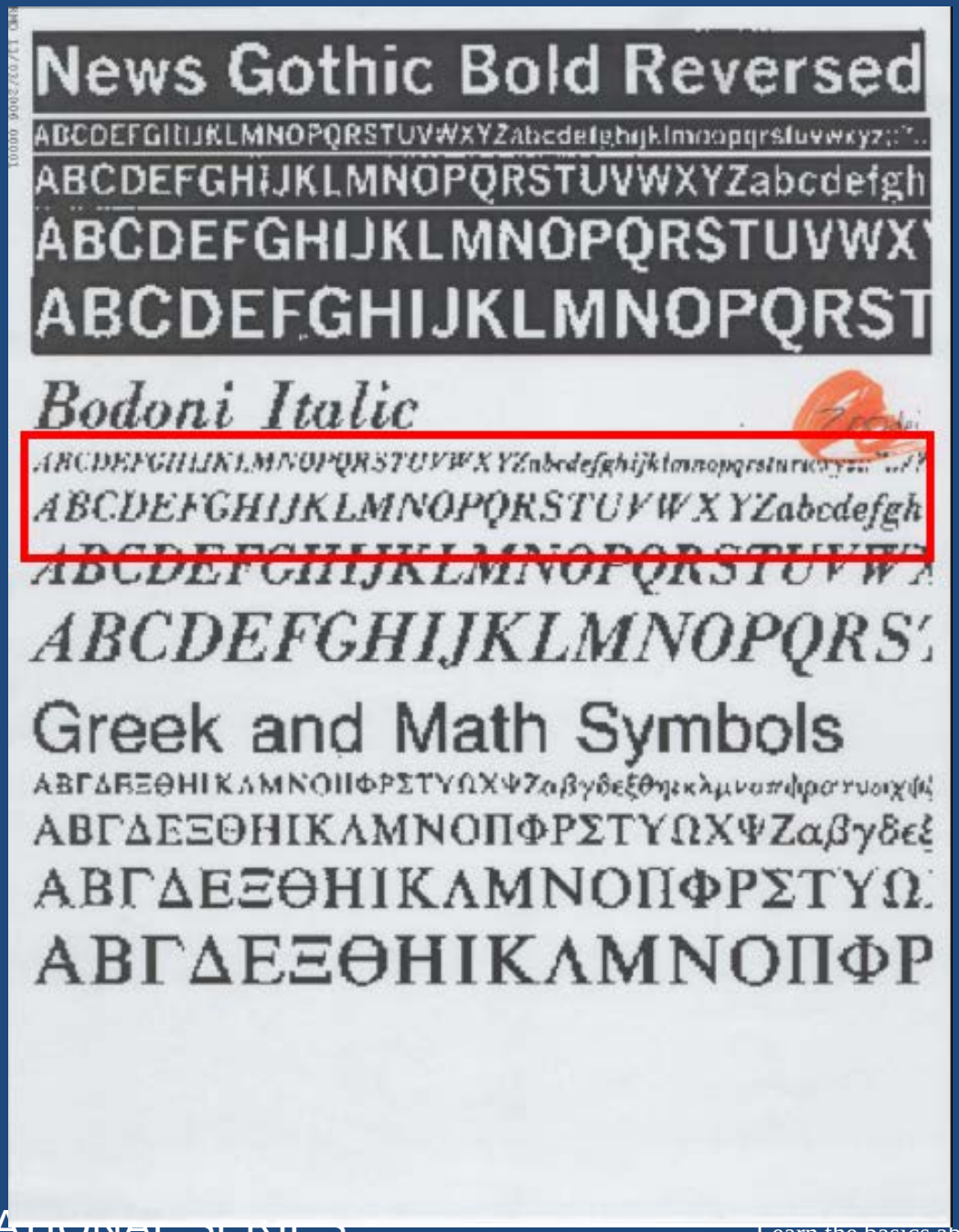
Grayscale scan

200 dpi scan

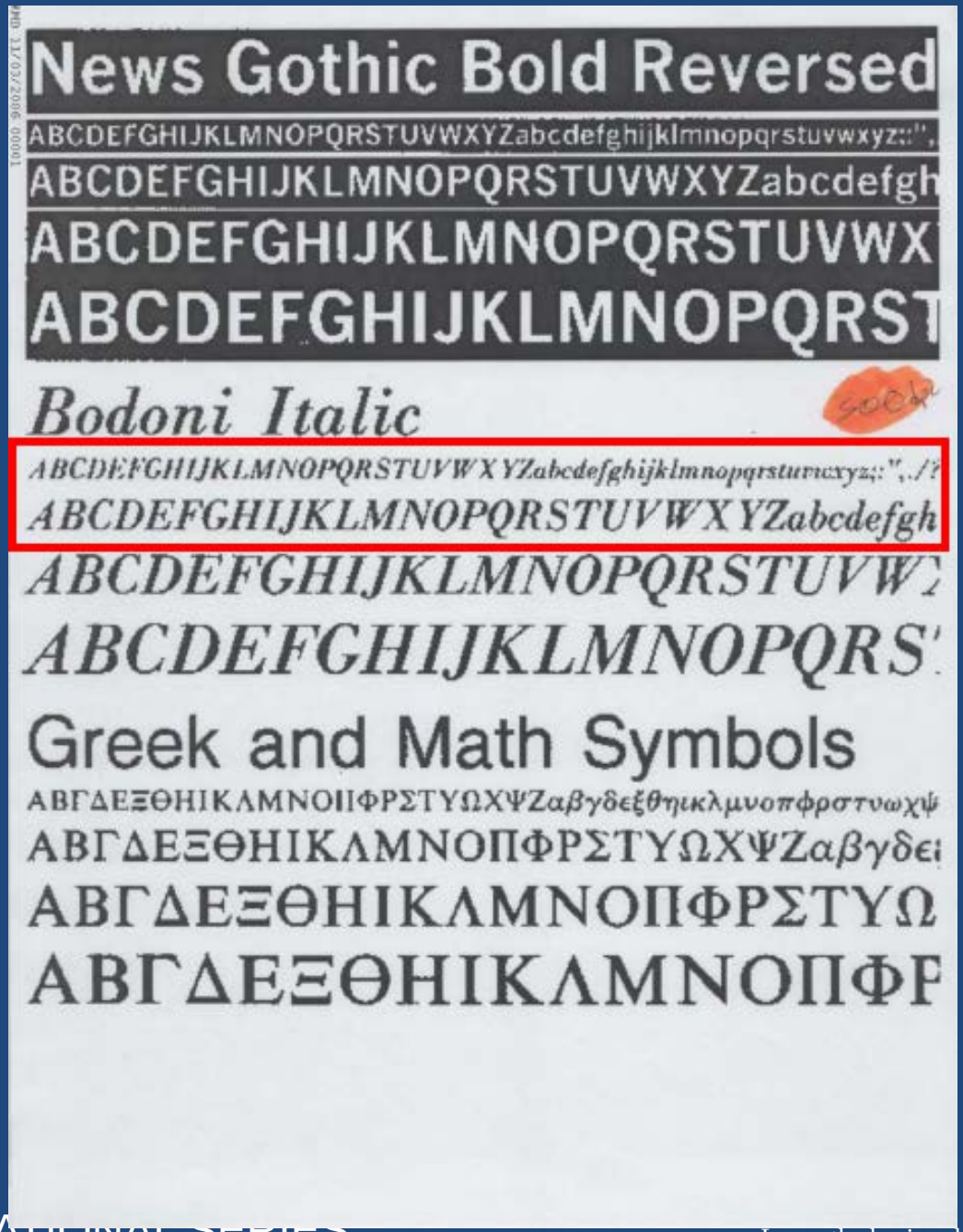


Grayscale scan

300 dpi scan


News Gothic Bold Reversed
Bodoni Italic
Greek and Math Symbols

200 dpi scan


News Gothic Bold Reversed
ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz::",
ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefgh
ABCDEFGHIJKLMNOPQRSTUVWX
ABCDEFGHIJKLMNOPQRST
Bodoni Italic
ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz::",../?
ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefgh
ABCDEFGHIJKLMNOPQRSTUVW
ABCDEFGHIJKLMNOPQRS
Greek and Math Symbols
ΑΒΓΔΕΞΘΗΙΚΛΜΝΟΠΦΡΣΤΥΩΧΨΖαβγδεξθηικλμνοπφρστνωχψ
ΑΒΓΔΕΞΘΗΙΚΛΜΝΟΠΦΡΣΤΥΩΧΨΖαβγδει
ΑΒΓΔΕΞΘΗΙΚΛΜΝΟΠΦΡΣΤΥΩ
ΑΒΓΔΕΞΘΗΙΚΛΜΝΟΠΦΡ

300 dpi scan

Compression

- Image files come in different formats, such as .gif, .jpg, and .tif.
- Most formats are proprietary, so computers need software for viewing them.
- Proprietary file formats may not be supported long term and may vary from each vendor.
- Many formats use compression:
  - less storage space
  - speed transmission
- Compression
  - *Lossless* = less compression but no data loss - .tif
  - *Lossy* = deep compression with subsequent data loss - .jpg
    - Don't necessarily look the same after compression.

National Archives and Records Administration, Frequently Asked Questions About Imaged Records
http://www.archives.gov/records-mgmt/faqs/imaged.html

Scanners

Some scanners are sheet-fed and high volume, others are flat-bed and low volume--different tools for different work

Scanners

Some people use multifunctional machines to scan their documents.

7 August 2013 Last updated at 15:37 ET

Confused Xerox copiers rewrite scanned documents, expert finds

Scans made by some Xerox copiers are changing numbers on documents, a German computer scientist has discovered.

Machines similar to this model were swapping around numbers, David Kriesel discovered

David Kriesel found that scans he made of construction plans had altered room dimensions.

Other users have replicated the problem, which has been blamed on faults with compression software used in a setting offered by the models.

The company has not yet issued a fix for the problem, but it told the BBC it was preparing a statement.

Mr Kriesel said he worried that numbers could be altered on invoices and other important documents.

Shrinking room

He questioned whether incorrect figures could leave a company liable to legal action.

Niri Shan, a partner at London-based law firm Taylor Wessing, told the BBC it could raise interesting legal implications.

"The person who provided the figures would be liable. Then the question would be, could they turn round [to the manufacturer] and say, 'Hold on a minute, this is your fault'?

"Often in commercial contracts, the manufacturer may have limitations of liability on consequential loss."

In his tests, Mr Kriesel found that often the number "6" would be turned into an "8", and vice versa, with other numbers being affected too.

One room on his reproduced plans had its dimensions shrunk from 21.11m to 14.13m.

Substitute figures

He said the anomaly is caused by Jbig2, an image compression standard.

Image compression is typically used to make file sizes smaller.

Jbig2 would substitute figures it thought were the same, meaning similar numbers were being wrongly swapped.

Mr Kriesel said the two models affected were the Xerox Workcentre 7535 and 7556.

However, since posting details of the fault online, several other users have come forward with problems on other machines.

This story was updated on 7 August 2013 to reflect the fact that Xerox said the problem only affects scans made under a certain setting by its machines.

Related Stories

- How the computer changed the office forever
- Mouse inventor 'never made money'
- Fuji Xerox sees big Burma opportunity

http://www.bbc.com/news/technology-23588202

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http://simplifywork.blogs.xerox.com/2013/08/07/update-on-scanning-issue-software-patches-to-come/#.VC7stNTn-Ag

xerox

Go to...

Update on Scanning Issue: Software Patches To Come

By Ken Ericson | Aug 7, 2013 | Printing, Publishing, Workflow | 25 Comments

Share 8+1 12

Posted on Aug. 22, 10:00amET

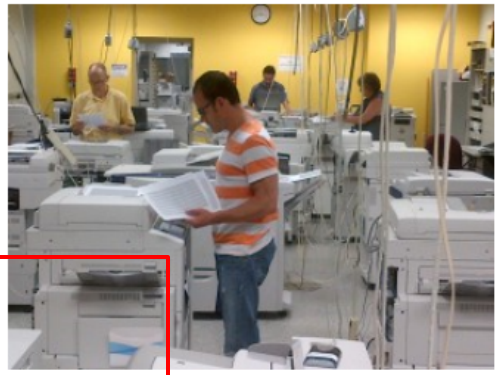
Editor's Note: The first wave of software patches is now available. Please read our latest blog post for more details.

Posted on Aug. 19, 2:50pm ET

Patch for Scanning Issues Available Shortly

By Rick Dastin, corporate vice president and president, Office and Solutions Business Group

Our technology team has been working very hard to make the software patch available that addresses character substitution that can occur when "stress documents" are scanned on some Xerox office devices.



Xerox engineers test software patch

To confirm the patch effectiveness, we reached out to computer scientist David Kriesel, who first brought the issue to our attention. David has provided invaluable insight, and his willingness to collaborate and conduct additional tests has been extremely helpful. We were pleased to hear back from David that the test patch we provided solves the problem and he no longer sees the substitution of characters on the document.

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Imaging Steps, *Continued*

- Indexing
- Quality Control
- Storage
  - Optical Disk (WORM)
  - CD-ROM
  - CD-R
  - Server
  - Tape

Sources: Information & Records Management and Records Management Handbook

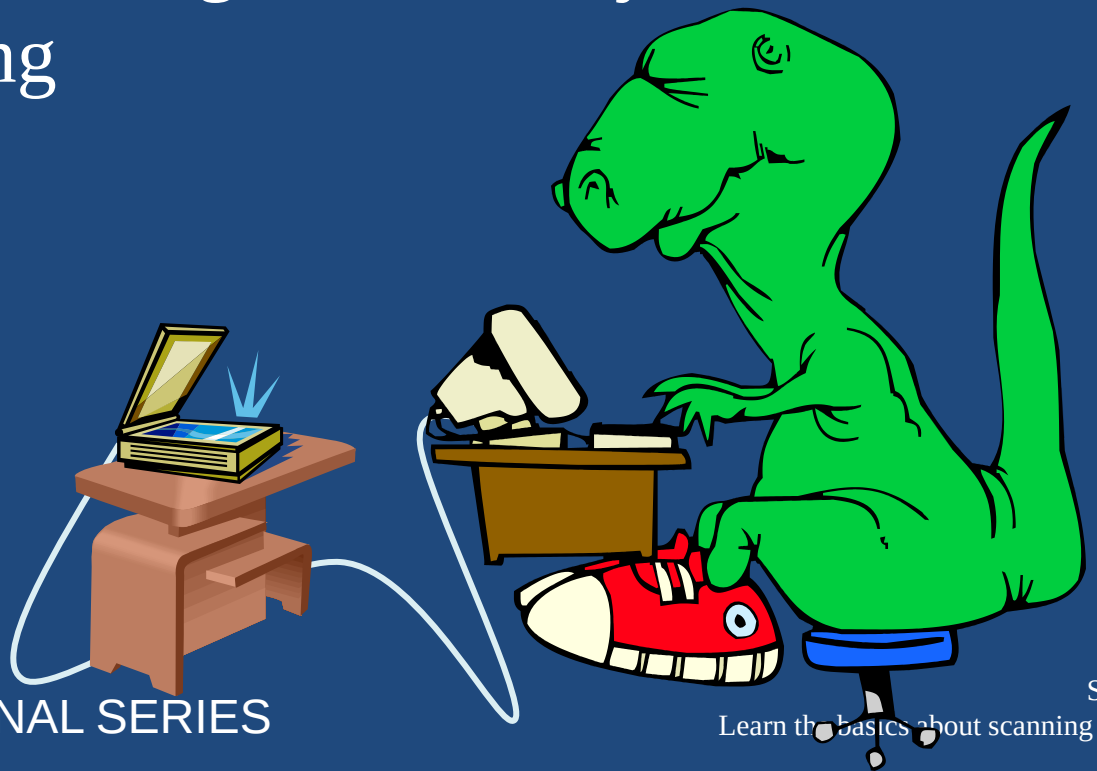
Indexing

- Without an index, you'll never find it!
- Level of indexing - file or document?
- Title, author, creating agency, date, retention period, key words, description, etc.
- Generally, index from the screen image
- Accuracy
- When to index

Sources: Information & Records Management and Records Management Handbook

Indexing

- A good index ensures retrieval
- Each index unique to your records
- Some indexing can be automatic--depends on document consistency
- Most indexing is data-entry at or near time of scanning



Indexing
The Importance of Classifying

- Apple
- Microwave Popcorn
- Coffee Creamers
- Creamed Corn
- Tomato Sauce
- Campbell's Chicken Noodle Soup
- Peaches Fruit Cup
- Canned Chicken
- Small Red Potato
- Smucker's Hot Caramel Sauce
- Fiber One Chewy Bar

Indexing
The Importance of Classifying

1. Apple
2. Microwave Popcorn
3. Coffee Creamers
4. Creamed Corn
5. Tomato Sauce
6. Campbell's Chicken Noodle Soup
7. Peaches Fruit Cup
8. Canned Chicken
9. Small Red Potato
10. Smucker's Hot Caramel Sauce
11. Fiber One Chewy Bar

A. Fruit = items 1 and 7
B. Snack = items 1, 2, 7, 11
C. Refrigerated = item 1
D. Pantry = items 2-11
E. Coffee = item 3
F. Vegetable = items 4, 5, 9
G. Canned Food = items 4, 5, 6, 7
H. Soup = item 6
I. Canned Meat = item 8
J. Dessert = item 10
K. Others – colors, requiring cooking or heating, eat with a utensil or with hands, etc.

Indexing
The Importance of Naming Conventions

- Dates
- UC locations
- Spaces or not
- Hyphens or not
- Underscores or not
- Acceptable abbreviations
- People's names
- Other

- May 3, 2014, 05/03/14, 2014/03/05
- UC-OP, UCOP, Berkeley, DC
- With spaces, Nospaces
- With-hyphens, No hyphens
- With_underscores, No underscores
- Jan., Feb.
- First name Last name, Last name only
- Other????

Scanning and Indexing
Very important parts of the whole process

- Often overlooked and given to those who do not understand the importance of scanning correctly and indexing correctly
- The more decentralized these activities are, the more controls have to be in place to assure good quality
- Document your scanning and indexing procedures
- Be sure to update your procedural manuals to reflect any changes made to your processes

Quality Control (QC)

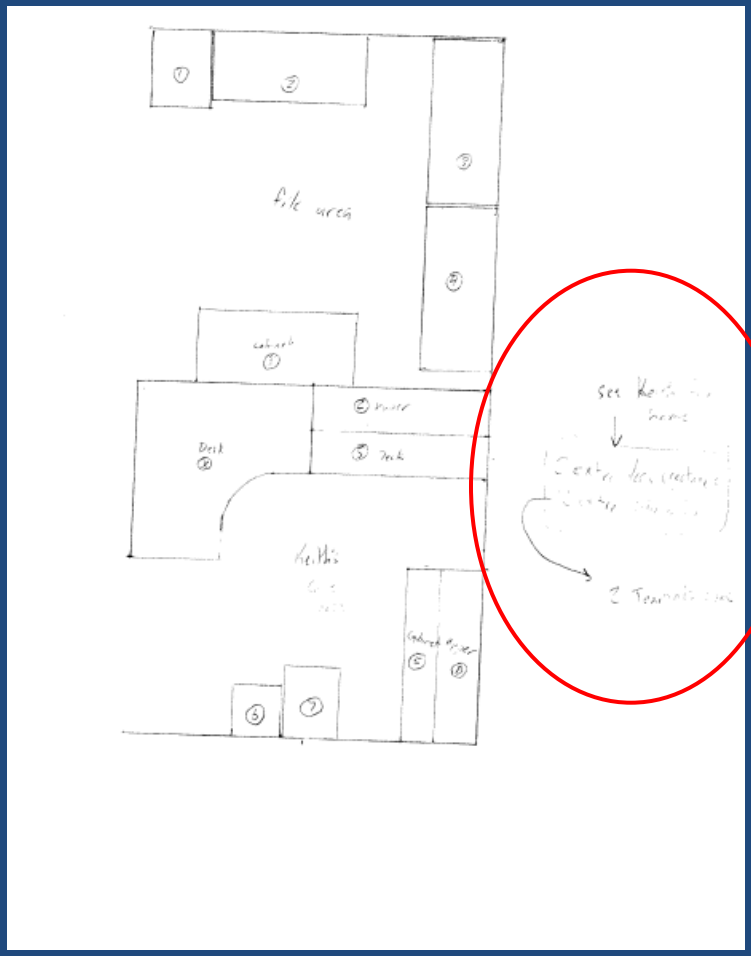
Quality Control--An essential element

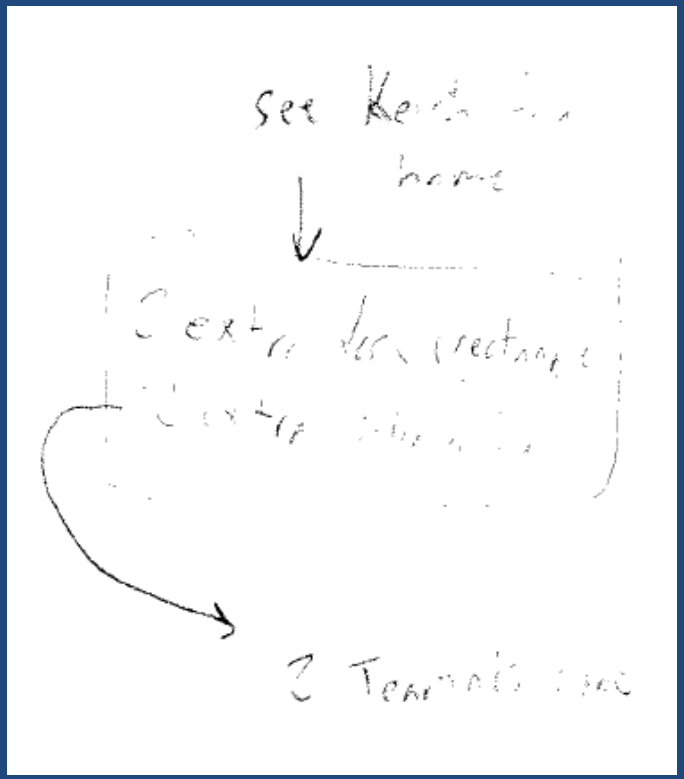
- Control on scanning
  - Page level inspection as scanned
  - Spot checks after
- Control on indexing
  - Error detection and correction
  - Keystroke method--do it twice
  - Proofreading

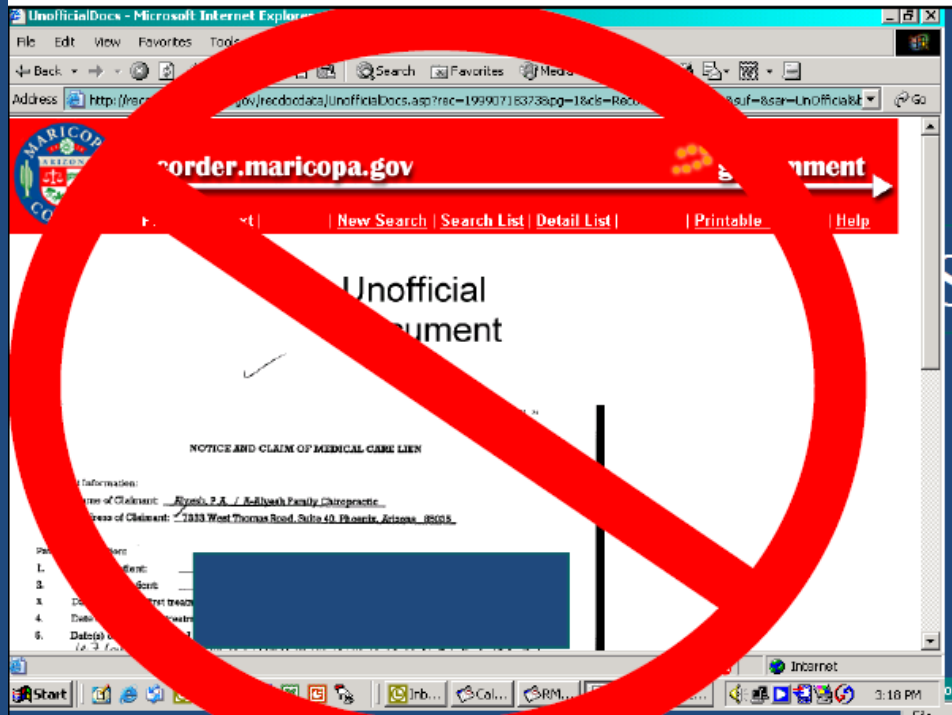
QC

- View every document on screen for clarity, double feeds, misalignments, illegibility, half scanned images, both sides of double-sided documents, all pages, and other quality issues
- If it is a large job, decide on a specific number of images to review (every 10th, specific document types more than others, etc.)
- For smaller scale systems, QC is done at the same time as manual indexing
- If indexing is separate from scanning, then QC must be done for each task
- If no indexing, then QC will be the most time consuming
- Document your QC procedures

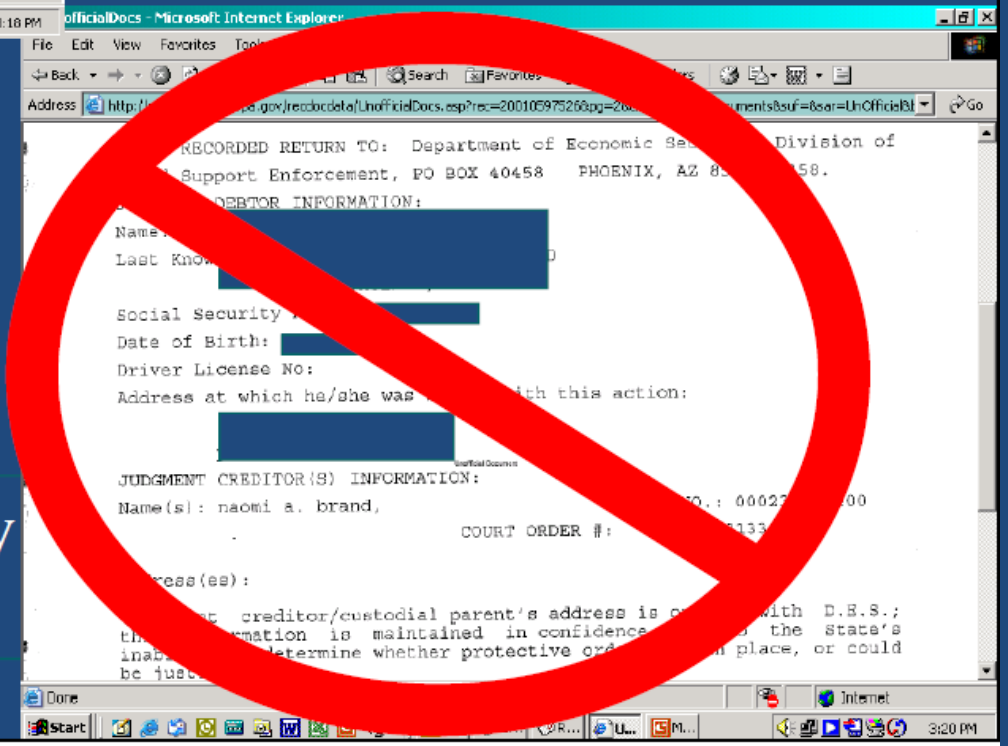
We used to have the records in (paper or microfilm/fiche) but we had them scanned and then we destroyed the other records. Now we are finding out that no one checked the scans to make sure they were legible.







Someone's medical information



Enough information for Identity Theft

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INFORMATIONAL SERIES

Enhancement techniques

- Adaptive thresholding – measures according to contrast
- Cropping – Removes any borders
- Deskewing – Straightens the image
- Despeckling – Removes spots
- Dithering – Used for grayscale photos scanned with a bitonal scanner
- Edge Detection – Removes scanned information past the edge of the page
- Inverting – Switches to black on white
- Rotating – Turns landscape (or portrait) upside down
- Thresholding – Measures for white versus black dots

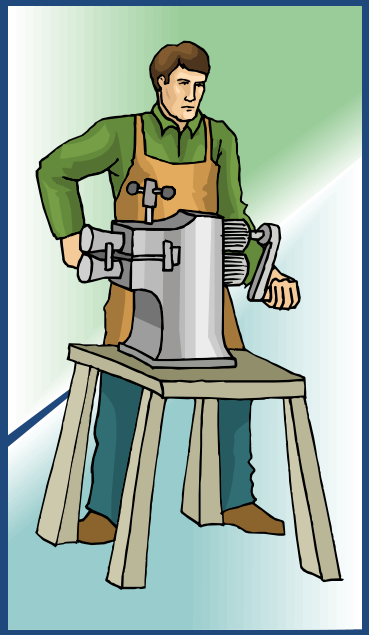
Be sure to document what enhancements are acceptable in your procedures.

QC

- Checking the work processes, the images, and the indexing up-front in the normal course of business is a must!
- Regularly “audit” your processes and update them as needed
- Be sure to update your procedural manuals to reflect any changes made to your processes

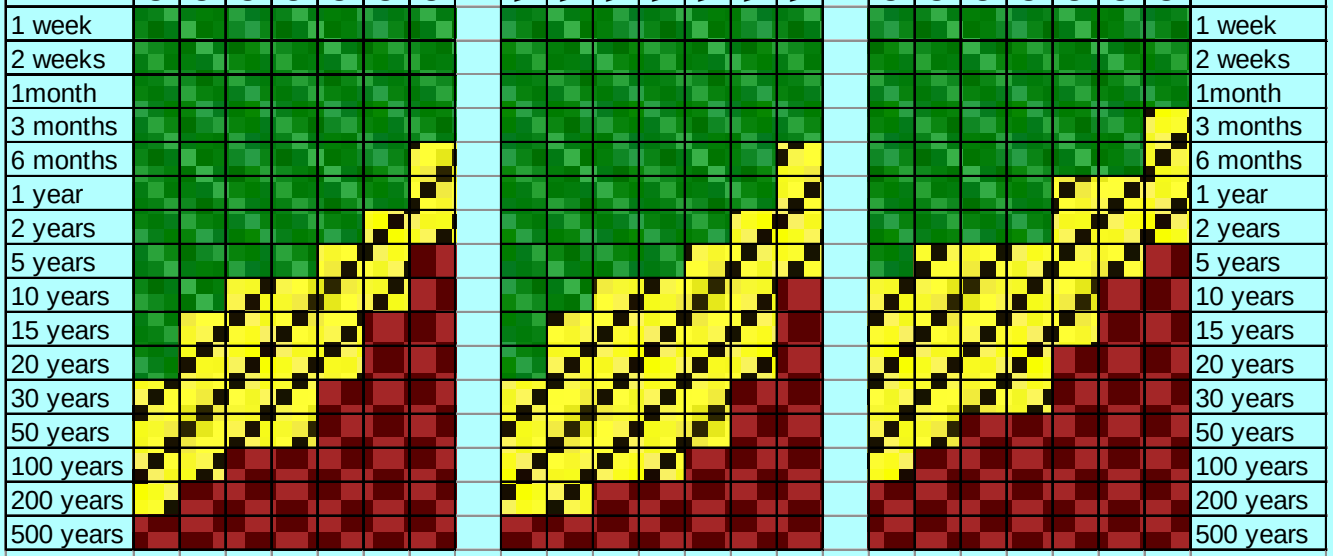
Storage

- Electronic images = store on any electronic media
- Hard Drives
  - Faster retrieval, but must be backed up
  - CD/Tape storage or back up
- Files are compressed



Adapted from Media Stability Disposition Charts
by John VanBogart, National Media Lab, Jan. 1996

Life Expectancy of Optical Media

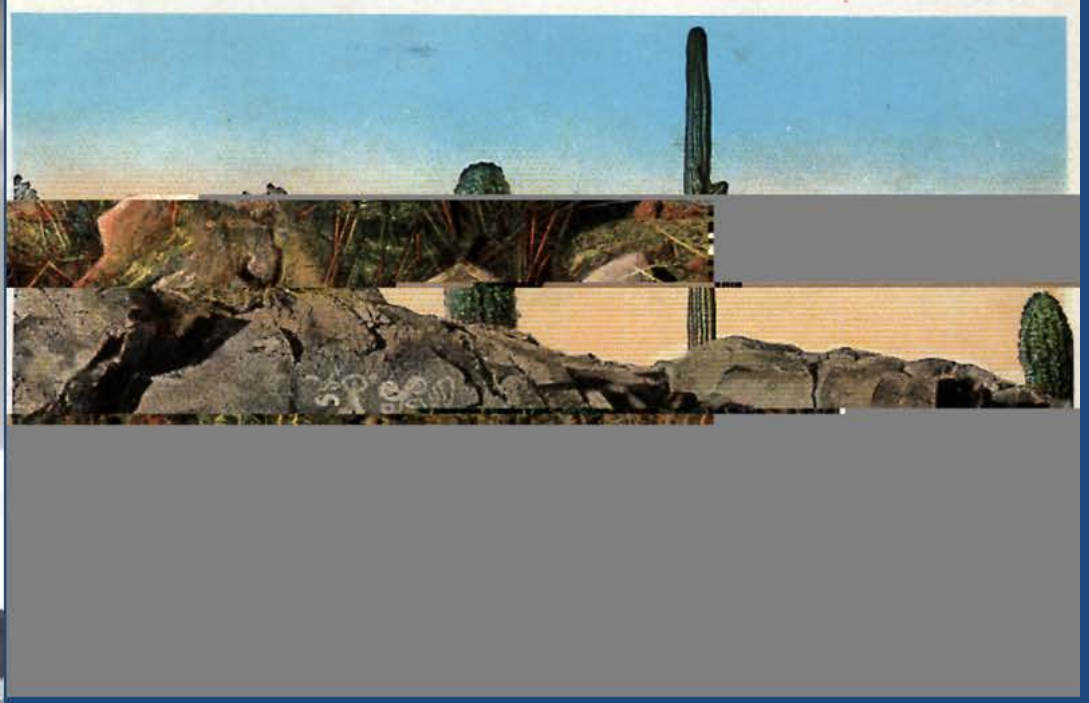


All major vendors are acceptable for reliable data storage under these conditions for these times.

Only the best vendors are acceptable for storage under these conditions and times.

No vendors are considered acceptable for storage under these conditions and times. All may fail.

A = 50 F & 25% RH
B = 59 F & 30% RH
C = 65 F & 30% RH
D = 68 F & 40% RH
E = 77 F & 50% RH
F = 86 F & 60% RH
G = 104 F & 80% RH



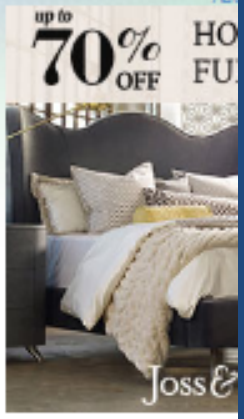
Images with sector swap
from CDs less than 2 years old


RARE SPECIMEN GIANT CACTUS,
NEAR MOHAWK, ARIZONA


Barrel Cactus.

Oops! Techie wipes out $38 billion fund

Keystroke mistake deletes data for Alaska's oil-funded account



Associated Press
updated 3/20/2007 10:04:27 AM ET

Print | Font: A A + –

JUNEAU, Alaska — Perhaps you know that sinking feeling when a single keystroke accidentally destroys hours of work. Now imagine wiping out a disk drive containing an account worth $38 billion.

That's what happened to a computer technician reformatting a disk drive at the Alaska Department of Revenue. While doing routine maintenance work, the technician accidentally deleted applicant information for an oil-funded account — one of Alaska residents' biggest perks — and mistakenly reformatted the backup drive, as well.

There was still hope, until the department discovered its third line of defense, backup tapes, were unreadable.

"Nobody panicked, but we instantly went into planning for the worst-case scenario," said Permanent Fund Dividend Division Director Amy Skow. The computer foul-up last July would end up costing the department more than $200,000.

Over the next few days, as the department, the division and consultants from Microsoft Corp. and Dell Inc. labored to retrieve the data, it became obvious the worst-case scenario was at hand.

Nine months worth of information concerning the yearly payout from the Alaska Permanent Fund was gone: some 800,000 electronic images that had been painstakingly scanned into the system months earlier, the 2006 paper applications that people had either mailed in or filed over the counter, and supporting documentation such as birth certificates and proof of residence.

And the only backup was the paperwork itself — stored in more than 300 cardboard boxes.

"We had to bring that paper back to the scanning room, and send it through again, and quality control it, and then you have to have a way to link that paper to that person's file," Skow said.

Half a dozen seasonal workers came back to assist the regular division staff, and about 70 people working overtime and weekends re-entered all the lost data by the end of August.

"They were just ready, willing and able to chip in and, in fact, we needed all of them to chip in to get all the paperwork rescanned in a timely manner so that we could meet our obligations to the public," Skow said.

Last October and November, the department met its obligation to the public. A majority of the estimated 600,000 payments for last year's $1,106.96 individual dividends went out on schedule, including those for 28,000 applicants who were still under review when the computer disaster struck.

Former Revenue Commissioner Bill Corbus said no one was ever blamed for the incident.

"Everybody felt very bad about it and we all learned a lesson. There was no witch hunt," Corbus said.

According to department staff, they now have a proven and regularly tested backup and restore procedure.

The department is asking lawmakers to approve a supplemental budget request for $220,700 to cover the excess costs incurred during the six-week recovery effort, including about $128,400 in overtime and $71,800 for computer consultants.

The money would come from the permanent fund earnings, the money earmarked for the dividends. That means recipients could find their next check docked by about 37 cents.

Pros and cons of scanning records

- Advantages
- Disadvantages

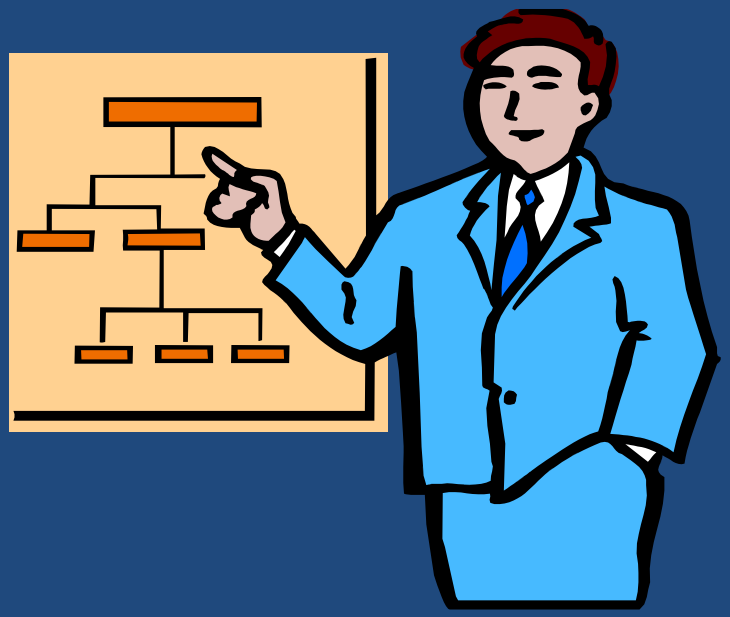
Imaging Advantages

- Instant, simultaneous and remote access
- Transmission of information
- Filing and retrieval
- Increased productivity
- Can integrate with a document management and records management automation systems
- Reduces hard copy storage space needs

Sources: Information & Records Management and Records Management Handbook

Imaging Advantages

- Fewer misfiles
- Workflow
  - Set up work paths
  - Version control
- Small storage space



Imaging Advantages

- Computer sorting
- Audit/Document tracking
- Freeze electronic record
- Can maintain content, context, structure

Imaging strengths and weaknesses

- Strengths
  - Replaces the manual movement and duplication of paper
  - Controls and improves customer service
  - May be admissible in court
  - Facilitates process redesign
- Weaknesses
  - Limited content searching
  - Static documents cannot be edited
  - May be inadmissible in court
  - Large file sizes (storage and bandwidth issues)

Imaging Disadvantages

- Expensive
- Obsolescence
  - Media
  - Software
  - Hardware
- System Independence
- Lost records due to bad indexing

Assessing your scanning needs

- Scan-worthiness of the records
  - Scan worthy
    - Official Records
    - Active Records
  - Not scan worthy:
    - Non-Records, including convenience copies
    - Inactive Records
    - Records with Lapsed Retention Periods
    - Records that are under a “Records Freeze”
- It may be appropriate to have paper records, especially if you purge regularly

Cost/Cubic Foot

In Office

In Records Center

Cost to scan

VS

VS

$62.98/Month

Only cost of sq footage per cubic foot, not cabinets amortized. Cabinet equates to 9.2 cubic feet, 10.73 sq. feet = $579.42/month.

$0.16/Month

Only cost of storage per cubic foot

$100.00-$400.00/ per cubic foot

Only cost of scanning and indexing per cubic foot, one-sided documents – 2,000 pages per cubic foot. $.05-.20/page.

Assessing your scanning needs

- E-SIGN ACT
  - Electronic Signatures in Global and National Commerce
- California UETA
  - http://www.leginfo.ca.gov/cgi-bin/displaycode?section=civ&group=01001-02000&file=1633.1-1633.17
- Wet signature needs
- Laws and regulations that apply to your records
  - IRS requirements
  - Student Loans requirements
  - FAR requirements
  - DHS requirements

IRS requirements

http://www.irs.gov/pub/irs-irbs/irb97-13.pdf

SECTION 4. ELECTRONIC STORAGE SYSTEM REQUIREMENTS

.01 *General Requirements.*

(1) An electronic storage system must ensure an accurate and complete transfer of the hardcopy or computerized books and records to an electronic storage media. The electronic storage system must also index, store, preserve, retrieve, and reproduce the electronically stored books and records.

(2) An electronic storage system must include:

(a) reasonable controls to ensure the integrity, accuracy, and reliability of the electronic storage system;

(b) reasonable controls to prevent and detect the unauthorized creation of, addition to, alteration of, deletion of, or deterioration of electronically stored books and records;

(c) an inspection and quality assurance program evidenced by regular evaluations of the electronic storage system including periodic checks of electronically stored books and records;

(d) a retrieval system that includes an indexing system (within the meaning of section 4.02 of this revenue procedure); and

(e) the ability to reproduce legible and readable hardcopies (within the meaning of section 4.01(3) of this revenue procedure) of electronically stored books and records.

(3) All books and records reproduced by the electronic storage system must exhibit a high degree of legibility and readability when displayed on a video display terminal and when reproduced in hardcopy. The term "legibility" means the observer must be able to identify all letters and numerals positively and quickly to the exclusion of all other letters or numerals. The term "readability" means that the observer must be able to recognize a group of letters or numerals as words or complete numbers. The taxpayer must ensure that the reproduction process maintains the legibility and readability of the electronically stored document.

(4) The information maintained in an electronic storage system must provide support for the taxpayer's books and records (including books and records in an automated data processing system). For example, the information maintained in an electronic storage system and the taxpayer's books and records must be cross-referenced in a manner that provides an audit trail between the general ledger and the source document(s).

(5) For each electronic storage system used, the taxpayer must maintain, and make available to the Service upon request, complete descriptions of:

(a) the electronic storage system, including all procedures relating to its use; and

(b) the indexing system (see section 4.02 of this revenue procedure).

(6) At the time of an examination, or for the tests described in section 5 of this revenue procedure, the taxpayer must:

(a) retrieve and reproduce (including hardcopies if requested) electronically stored books and records; and

(b) provide the Service with the resources (e.g., appropriate hardware and software, personnel, documentation, etc.) necessary to locate, retrieve, read, and reproduce (including hardcopies) any electronically stored books and records.

(7) An electronic storage system must not be subject, in whole or in part, to any agreement (such as a contract or license) that would limit or restrict the Service's access to and use of the electronic storage system on the taxpayer's premises (or any other place where the electronic storage system is maintained), including personnel, hardware, software, files, indexes, and software documentation.

(8) The taxpayer must retain electronically stored books and records so long as their contents may become material in the administration of the Internal Revenue laws under § 1.6001–1(e).

(9) The taxpayer may use more than one electronic storage system. In that event, each electronic storage system must meet the requirements of this revenue procedure. Electronically stored books and records that are contained in an electronic storage system with respect to which the taxpayer ceases to maintain the hardware and the software necessary to satisfy the conditions of this revenue procedure will be deemed destroyed by the taxpayer, unless the electronically stored books and records remain available to the Service in conformity with this revenue procedure.

(10) Taxpayers may use reasonable data compression or formatting technologies as part of their electronic storage system so long as the requirements of this revenue procedure are satisfied.

.02 *Requirements of an Indexing System.*

(1) For purposes of this revenue procedure, an "indexing system" is a system that permits the identification and retrieval for viewing or reproducing of relevant books and records maintained in an electronic storage system. For example, an indexing system might consist of assigning each electronically stored document a unique identification number and maintaining a separate database that contains descriptions of all electronically stored books and records along with their identification numbers. In addition, any system used to maintain, organize, or coordinate multiple electronic storage systems is treated as an indexing system under this revenue procedure. The requirement to maintain an indexing system will be satisfied if the indexing system is functionally comparable to a reasonable hardcopy filing system. The requirement to maintain an indexing system does not require that a separate electronically stored books and records description database be maintained if comparable results can be achieved without a separate description database.

(2) Reasonable controls must be undertaken to protect the indexing system against the unauthorized creation of, addition to, alteration of, deletion of, or deterioration of any entries.

.03 *Recommended Practices.* The implementation of records management practices is a business decision that is solely within the discretion of the taxpayer. Records management practices may include the labeling of electronically stored books and records, providing a secure storage environment, creating back-up copies, selecting an off-site storage location, retaining hardcopies of books or records that are illegible or that cannot be accurately or completely transferred to an electronic storage system, and testing to confirm records integrity.

SECTION 5. DISTRICT DIRECTOR TESTING

.01 The District Director may periodically initiate tests of a taxpayer's electronic storage system. These tests may include an evaluation (by actual use) of a taxpayer's equipment and software, as well as the procedures used by a taxpayer to prepare, record, transfer, index, store, preserve, retrieve, and reproduce electronically stored documents. In some instances, the District

Student loans requirements

34 CFR § 674.19 (e) (4)

(4) *Manner of retention of promissory notes and repayment schedules.* An institution shall keep the original promissory notes and repayment schedules until the loans are satisfied. If required to release original documents in order to enforce the loan, the institution must retain certified true copies of those documents.

(i) An institution shall keep the original paper promissory note or original paper MPN and repayment schedules in a locked, fireproof container.

(ii) If a promissory note was signed electronically, the institution must store it electronically and the promissory note must be retrievable in a coherent format. An original electronically signed MPN must be retained by the institution for 3 years after all the loans made on the MPN are satisfied.

(iii) After the loan obligation is satisfied, the institution shall return the original or a true and exact copy of the note marked “paid in full” to the borrower, or otherwise notify the borrower in writing that the loan is paid in full, and retain a copy for the prescribed period.

(iv) An institution shall maintain separately its records pertaining to cancellations of Defense, NDSL, and Federal Perkins Loans.

(v) Only authorized personnel may have access to the loan documents.

FAR requirements

Federal Acquisition Regulations System
48 CFR § 4.703(c)(3)
(c) Nothing in this section shall be construed to preclude a contractor from duplicating or storing original records in electronic form unless they contain significant information not shown on the record copy. Original records need not be maintained or produced in an audit if the contractor or subcontractor provides photographic or electronic images of the original records and meets the following requirements:
(1) The contractor or subcontractor has established procedures to ensure that the imaging process preserves accurate images of the original records, including signatures and other written or graphic images, and that the imaging process is reliable and secure so as to maintain the integrity of the records.
(2) The contractor or subcontractor maintains an effective indexing system to permit timely and convenient access to the imaged records.
(3) The contractor or subcontractor retains the original records for a minimum of one year after imaging to permit periodic validation of the imaging systems.
(d) If the information described in paragraph (a) of this section is maintained on a computer, contractors shall retain the computer data on a reliable medium for the time periods prescribed. Contractors may transfer computer data in machine readable form from one reliable computer medium to another. Contractors' computer data retention and transfer procedures shall maintain the integrity, reliability, and security of the original computer data. Contractors shall also retain an audit trail describing the data transfer. For the record retention time periods prescribed, contractors shall not destroy, discard, delete, or write over such computer data.

DHS; I-9 requirements

From 8 CFR Part 274a.2(b)(3):

> (3) Copying of documentation. An employer, or a recruiter or referrer for a fee may, but is not required to, copy or make an electronic image of a document presented by an individual solely for the purpose of complying with the verification requirements of this section. If such a copy or electronic image is made, it must either be retained with the Form I-9 or stored with the employee's records and be retrievable consistent with paragraphs (e), (f), (g), (h), and (i) of this section. The copying or electronic imaging of any such document and retention of the copy or electronic image does not relieve the employer from the requirement to fully complete section 2 of the Form I-9. An employer, recruiter or referrer for a fee should not, however, copy or electronically image only the documents of individuals of certain national origins or citizenship statuses. To do so may violate section 274B of the Act.

DHS; I-9 requirements, *continued*

(e) Standards for electronic retention of Form I-9 . (1) Any person or entity who is required by this section to complete and retain Forms I-9 may complete or retain electronically only those pages of the Form I-9 on which employers and employees enter data in an electronic generation or storage system that includes:
(i) Reasonable controls to ensure the integrity, accuracy and reliability of the electronic generation or storage system;
(ii) Reasonable controls designed to prevent and detect the unauthorized or accidental creation of, addition to, alteration of, deletion of, or deterioration of an electronically completed or stored Form I-9, including the electronic signature if used;
(iii) An inspection and quality assurance program evidenced by regular evaluations of the electronic generation or storage system, including periodic checks of the electronically stored Form I-9, including the electronic signature if used;
(iv) In the case of electronically retained Forms I-9, a retrieval system that includes an indexing system that permits searches consistent with the requirements of paragraph (e)(6) of this section; and
(v) The ability to reproduce legible and readable hardcopies.
(2) All documents reproduced by the electronic retention system must exhibit a high degree of legibility and readability when displayed on a video display terminal or when printed on paper, microfilm, or microfiche. The term “legibility” means the observer must be able to identify all letters and numerals positively and quickly, to the exclusion of all other letters or numerals. The term “readability” means that the observer must be able to recognize any group of letters or numerals that form words or numbers as those words or complete numbers. The employer, or recruiter or referrer for a fee, must ensure that the reproduction process maintains the legibility and readability of the electronically stored document.
(3) An electronic generation or storage system must not be subject, in whole or in part, to any agreement (such as a contract or license) that would limit or restrict access to and use of the electronic generation or storage system by an agency of the United States, on the premises of the employer, recruiter or referrer for a fee (or at any other place where the electronic generation or storage system is maintained), including personnel, hardware, software, files, indexes, and software documentation.
(4) A person or entity who chooses to complete or retain Forms I-9 electronically may use one or more electronic generation or storage systems. Each electronic generation or storage system must meet the requirements of this paragraph, and remain available as long as required by the Act and these regulations. Employers may implement new electronic storage systems provided:
(i) All systems meet the requirements of paragraphs (e), (f), (g), (h) and (i) of this section; and
(ii) Existing Forms I-9 are retained in a system that remains fully accessible.

DHS; I-9 requirements, *continued*

(5) For each electronic generation or storage system used, the person or entity retaining the Form I-9 must maintain, and make available upon request, complete descriptions of:
(i) The electronic generation and storage system, including all procedures relating to its use; and
(ii) The indexing system.
(6) An "indexing system" for the purposes of paragraphs (e)(1)(iv) and (e)(5) of this section is a system that permits the identification and retrieval for viewing or reproducing of relevant documents and records maintained in an electronic storage system. For example, an indexing system might consist of assigning each electronically stored document a unique identification number and maintaining a separate database that contains descriptions of all electronically stored books and records along with their identification numbers. In addition, any system used to maintain, organize, or coordinate multiple electronic storage systems is treated as an indexing system. The requirement to maintain an indexing system will be satisfied if the indexing system is functionally comparable to a reasonable hardcopy filing system. The requirement to maintain an indexing system does not require that a separate electronically stored documents and records description database be maintained if comparable results can be achieved without a separate description database.
(7) Any person or entity choosing to retain completed Forms I-9 electronically may use reasonable data compression or formatting technologies as part of the electronic storage system as long as the requirements of 8 CFR 274a.2 are satisfied.
(8) At the time of an inspection, the person or entity required to retain completed Forms I-9 must:
(i) Retrieve and reproduce (including printing copies on paper, if requested) only the Forms I-9 electronically retained in the electronic storage system and supporting documentation specifically requested by an agency of the United States, along with associated audit trails. Generally, an audit trail is a record showing who has accessed a computer system and the actions performed within or on the computer system during a given period of time;
(ii) Provide a requesting agency of the United States with the resources (e.g., appropriate hardware and software, personnel and documentation) necessary to locate, retrieve, read, and reproduce (including paper copies) any electronically stored Forms I-9, any supporting documents, and their associated audit trails, reports, and other data used to maintain the authenticity, integrity, and reliability of the records; and
(iii) Provide, if requested, any reasonably available or obtainable electronic summary file(s), such as a spreadsheet, containing all of the information fields on all of the electronically stored Forms I-9 requested by a requesting agency of the United States.
(f) Documentation. (1) A person or entity who chooses to complete and/or retain Forms I-9 electronically must maintain and make available to an agency of the United States upon request documentation of the business processes that:
(i) Create the retained Forms I-9;
(ii) Modify and maintain the retained Forms I-9; and
(iii) Establish the authenticity and integrity of the Forms I-9, such as audit trails.
(2) Insufficient or incomplete documentation is a violation of section 274A(a)(1)(B) of the Act.
(3) Any officer listed in 8 CFR 287.4 may issue a subpoena to compel production of any documentation required by 8 CFR 274a.2. Nothing in this section is intended to limit the subpoena power of an agency of the United States under section 235(d)(4) of the Act.

DHS; I-9 requirements, *continued*

(g) Security. (1) Any person or entity who elects to complete or retain Forms I-9 electronically must implement an effective records security program that:
(i) Ensures that only authorized personnel have access to electronic records;
(ii) Provides for backup and recovery of records to protect against information loss, such as power interruptions;
(iii) Ensures that employees are trained to minimize the risk of unauthorized or accidental alteration or erasure of electronic records; and
(iv) Ensure that whenever the electronic record is created, completed, updated, modified, altered, or corrected, a secure and permanent record is created that establishes the date of access, the identity of the individual who accessed the electronic record, and the particular action taken.
(2) An action or inaction resulting in the unauthorized alteration, loss, or erasure of electronic records, if it is known, or reasonably should be known, to be likely to have that effect, is a violation of section 274A(b)(3) of the Act.
(h) Electronic signatures for employee. (1) If a Form I-9 is completed electronically, the attestations in Form I-9 must be completed using a system for capturing an electronic signature that meets the standards set forth in this paragraph. The system used to capture the electronic signature must include a method to acknowledge that the attestation to be signed has been read by the signatory. The electronic signature must be attached to, or logically associated with, an electronically completed Form I-9. In addition, the system must:
(i) Affix the electronic signature at the time of the transaction;
(ii) Create and preserve a record verifying the identity of the person producing the signature; and
(iii) Upon request of the employee, provide a printed confirmation of the transaction to the person providing the signature.
(2) Any person or entity who is required to ensure proper completion of a Form I-9 and who chooses electronic signature for a required attestation, but who has failed to comply with the standards set forth in this paragraph, is deemed to have not properly completed the Form I-9, in violation of section 274A(a)(1)(B) of the Act and 8 CFR 274a.2(b)(2).
(i) Electronic signatures for employer, recruiter or referrer, or representative. If a Form I-9 is completed electronically, the employer, the recruiter or referrer for a fee, or the representative of the employer or the recruiter or referrer, must attest to the required information in Form I-9. The system used to capture the electronic signature should include a method to acknowledge that the attestation to be signed has been read by the signatory. Any person or entity who has failed to comply with the criteria established by this regulation for electronic signatures, if used, and at the time of inspection does not present a properly completed Form I-9 for the employee, is in violation of section 274A(a)(1)(B) of the Act and 8 CFR 274a.2(b)(2).

12 Planning Steps

- Identify records
- Apply record schedule
- Improve current system
- Reevaluate files operation
- Learn about imaging
- Review laws that apply

- Analyze User Needs
- Analyze the documents to be imaged
- Determine indexing
- Design the proposed imaging system
- Cost-benefit analysis
- Implement imaging

Things to Consider

- Planning
  - Backfile Conversion
  - Condition of paper/prep time
  - Volume
- Indexing
  - Standard files or subject files
- Records Retention
- Quality Control
- Legal Issues

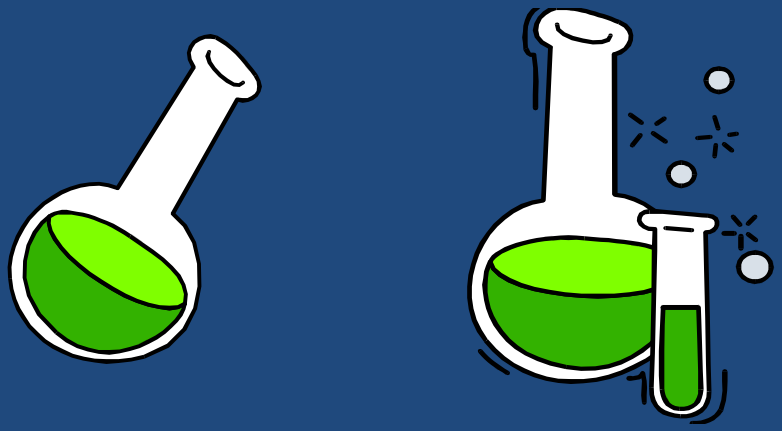
Planning

- Do *Systems Analysis* before considering Imaging
  - Organizational Viewpoint
  - User Viewpoint
  - Cost Justification
  - System Requirements

Sources: Information & Records Management and Records Management Handbook

Planning (Continued)

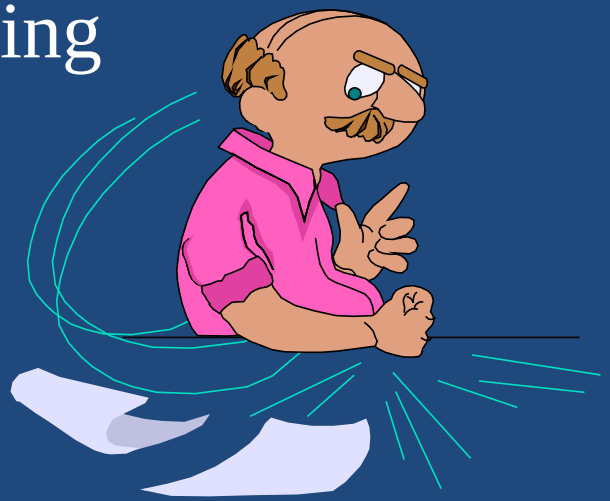
- Sampling & Testing
  - Size of the job
  - Random sampling for quality & quantity
  - Live test samples in a scanning system
  - Determine the size of the project



Sources: Information & Records Management and Records Management Handbook

Backfile Conversion

- Converting paper records created before the scanning system
- “Day forward”
- Old records with “high activity”
- “On demand” only
- Same sequence of steps in imaging



Sources: Information & Records Management and Records Management Handbook

Records Retention

- Long-term preservation is questionable
- Short-term not a problem (less than ten years)
- Need to migrate to new media
  - **This can be EXPENSIVE**
- Must ensure documents can be deleted or destroyed when retention is met

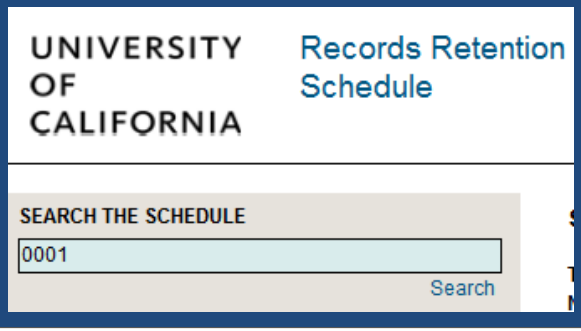
Legal Issues

- Images are PROBABLY admissible in court
  - Except some laws require retention of original
- Images must be made in normal course of business
- System must be documented for trustworthiness

Summary

- Automation will bring benefits if properly implemented
- Time, effort, careful research is needed
- Automation will fail if problems with the current paper recordkeeping system are not addressed *before* conversion
- Failure to plan will negate any benefits

Sources: Information & Records Management and Records Management Handbook



http://recordsretention.ucop.edu/

Search Results:

The items from the existing schedule that have not been superseded are in this database.
New items have a * after the number.

1 records found for "0001"

Records Code	Function	Function Description	Category	Category Description	Sub-Category Title	Keywords	Retention Period	Retention Rule	Comments
0001*	01. General Routine Office Transitory Records	Transitory records document routine general office activities. In this context the word "routine" more...	1. General Routine Office Transitory Records	Transitory records document routine general office activities. In this context the word "routine" more...		routine internal reports, routine internal reviews, routine internal plans, letters, more...	Official Record: Retain records for no longer than one year after their administrative use more...	Delete or destroy after the retention period has lapsed	View

Records Code	Function	Function Description	Category	Category Description	Sub-Category Title	Keywords	Retention Period
0001*	1. General Routine Office Transitory Records	Transitory records document routine genera office activities. In this context the wo "routin" more...	1. General Routine Office Transitory Records	Transitory records document routine general office activities. In this co the wo "routin" more...		routine internal reports, routine internal reviews, routine internal plans letters, more...	Official Reco Retain recor for no longer than one yea after their adm activ use more...
0002A*	2. Program Administration Records	Program administration records document the activities involved in managing and/or running the more...	A. Program administration records of enduring historical value	A. Program administration records of enduring historical value are those significant records that more...		academic plans, long range development plans, policy, policies, letters, acknowledge...	Official Reco Permanent, subject to University Archives revi Coordinate t transfer of more...
0002B*	2. Program Administration Records	Program administration records	B. Operational program administration	Operational program administration		letters, acknowledge... memos, notes,	Official Reco Retain recor years after th

Function:
1. General Routine Office Transitory Records

Function Description:
Transitory records document routine general office activities. In this context the word "routine" means activities related to the typical internal operation of an office, including: staffing, administrative procedures, systems, and communications. They do not serve as documentation of the establishment of unique programs, functions, units, or a campus, nor record fiscal obligations to demonstrate accountability or document important historical decisions of the University.

Category:
1. General Routine Office Transitory Records

Category Description:
Transitory records document routine general office activities. In this context the word "routine" means activities related to the typical internal operation of an office, including: staffing, administrative procedures, systems, and communications. They do not serve as documentation of the establishment of

• source documents that have been scanned, after the record created from the scan has been verified as accurate and stored in a proper recordkeeping system. The scanning process must meet authentication standards to assure the records' integrity, reliability and trustworthiness. Some source documents may need to be retained, even after scanning if required by law or agency regulations, for example wet-signature promissory notes, oaths, patents, etc. The documentation of the scanning process is not a transitory record and must be retained for as long as the converted record is retained. See the comments section for more information on scanning and recordkeeping systems.

• source documents that have been scanned, after the record created from the scan has been verified as accurate and stored in a proper recordkeeping system. The scanning process must meet authentication standards to assure the records' integrity, reliability and trustworthiness. Some source documents may need to be retained, even after scanning if required by law or agency regulations, for example wet-signature promissory notes, oaths, patents, etc. The documentation of the scanning process is not a transitory record and must be retained for as long as the converted record is retained. See the comments section for more information on scanning and recordkeeping systems.

The value (usefulness) of these routine facilitative records is short-lived and therefore their retention period is minimal.

Sub-Category Title:

Keywords:
routine internal reports, routine internal reviews, routine internal plans, letters, acknowledgements, e- mail messages, routine messages, office support records, logs, internal requests, administrative committees members records, unsolicited job

Record Code:
0001*

Functional Category:
1. General Routine Office Transitory Records

Keywords	Retention Period	Retention Rule	Comments
routine internal reports, routine	Official Record: Retain records	Delete or destroy after the	View

Comments:

Records created from sca
accurate following the im
destroyed unless prohibit
must be retained in a pro
The documentation of the
retained for as long as th

Some agencies have ver
for how imaging must be
IRS, FDA, and DHS. If re
must be kept, even after
promissory notes, oaths,
scanned, agency require

A proper recordkeeping s
standards for assuring th
integrity, availability, and
recordkeeping includes t
records to facilitate their
allowing records to be:
• grouped with related re
operational needs,
• retrieved easily and in
• retained in a usable for
an approved records rete
• accessed by individuals
system,
• secured from inappropr
identifiable information, r
• protected from inappro
and
• disposed of in accordan

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Retaining transitory reco
properly manage re

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Some of these records m
restricted information (re
access, disclosure and di
California and Federal la
Information" as defined i
Policy IS-2: (name plus S
identification card numbe

Records created from scanned source documents must be verified and documented as accurate following the imaging process. Thereafter, the source records may be destroyed unless prohibited by law or agency regulations. The created records must be retained in a proper recordkeeping system for their retention period. The documentation of the scanning process is not a transitory record and must be retained for as long as the converted record is retained.

Some agencies have very specific requirements for retaining source documents and for how imaging must be done. These agencies include but are not limited to FAR, IRS, FDA, and DHS. If required by law or agency regulations, source documents must be kept, even after having been scanned, for example wet-signature promissory notes, oaths, patents, etc. If records governed by an agency are scanned, agency requirements for imaging processes must be met.

A proper recordkeeping system is one that meets University of California standards for assuring the records are authentic and will retain their integrity, availability, and confidentiality for their lifecycle. Proper recordkeeping includes the collection, organization, and categorization of records to facilitate their preservation, retrieval, use, and disposition, allowing records to be:

- grouped with related records into classifications according to operational needs,
- retrieved easily and in a timely manner,
- retained in a usable format for the required retention period found in an approved records retention schedule, on-going investigation or legal action,
- accessed by individuals who have a need for the records found within the system,
- secured from inappropriate access when the records contain personally identifiable information, restricted or confidential information,
- protected from inappropriate dissemination, modification or destruction, and
- disposed of in accordance with approved retention schedules.

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Important Websites

- UC Records Retention Schedule (http://recordsretention.ucop.edu/)
- UC-Office of the President Records Retention Management (http://www.ucop.edu/information-technology-services/initiatives/records-retention-management/index.html)
- UCOP Central Records Collection Guidelines for Submission of Materials (http://www.ucop.edu/information-technology-services/services/ucop-it-services/records-management/ucop-central-records-collection-guidelines-for-submission-of-materials-.html)
- Shredding Records (http://www.ucop.edu/building-administrative-services/services/records-shredding.html)
- Storing Records Off-Site at a Commercial Records Center (http://www.ucop.edu/building-administrative-services/services/records-storage.html)
- UC-Wide Records Management (http://www.ucop.edu/information-technology-services/initiatives/records-management/index.html)

What we have discussed today

- How imaging works
- Pros and cons of scanning records
- Assessing your scanning needs

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Phone: (510) 987-9411