Glossary

A

Accelerator
A device or software designed to speed up operations, such as refreshing a screen image. Many PC SVGA graphics boards come furnished with accelerator chips. There are also auxiliary boards (commonly called pass-through boards) that will boost the speed of regular VGA boards.

Access
a) The availability of records to agency staff or to the public.

b) Permission to create, change, or consult electronic records. There can be several degrees of access privilege in a networked computer system or enterprise database.

c) Permission to use and reproduce records; may be limited or qualified (restricted) by the agency that has legal custody of the records.

Access Time
The time required for a data storage device to locate and retrieve data.

Accession
To transfer physical and legal custody of documentary material to an archival institution.

Additive Colors
Red, Green, Blue; the 3 colors used to create all other colors when direct, or transmitted, light is used (as in a video monitor). They are called additive primaries, because when these three colors are superimposed they produce white.

AIIM
The Association for Information and Image Management, a standards setting body affiliated with the American Standards Institute (ANSI), which is the principal developer of standards for microforms and information storage technologies involving images, such as optical disks and scanners.

Algorithm
The specific process in a computer program used to solve a particular problem

Aliasing
An effect caused by sampling an image (or signal) at too low a rate. It makes rapid change (high texture) areas of an image appear as a slow change in the sample image. Once aliasing occurs, there is no way to accurately reproduce the original image from the sampled image.

American Standard Code for Information Interchange (ASCII)
A widely utilized coding scheme which specifies bit patterns for computer-processible information. The ASCII coding scheme utilized in virtually all minicomputers and microcomputers and in many non-IBM mainframe computer systems.

Analog
Analog transmitted data can be represented electronically by a continuous wave form signal. Examples of analog items are traditional photographed images and phonograph albums.

Analog Image
A non-electronic image; non-digitized.

Analog to Digital Converter (A/D Converter)
A device that converts analog information (a photograph or video frame) into a series of numbers that a computer can store and manipulate.

ANSI
The American Standards Institute, a private national standards organization in the United States, which coordinates the development and maintenance of various industry standards.

Anti-aliasing
The process of reducing stair-stepping by smoothing edges where individual pixels are visible.

A method of filling in data which has been missed due to under-sampling. In imaging this usually takes on the process of removing jagged edges by interpolating values in-between pixels of contrast. These methods are most often used to remove or reduce the stair-stepping artifact found in digital high contrast images.

Application (software)
Software designed to perform a particular task: word processing or spreadsheet, for example.

Archival
A set of standards applied to storage media. Microfilm is considered an "archival" storage medium because it will last many years. Diskettes, magnetic tape, and optical disks, which are reliable for only a short time, are not considered archival storage media.

Archival Image
An image meant to have lasting utility. Archival images are usually kept off-line on a cheaper storage medium such as CD-ROM or magnetic tape, in a secure environment. Archival images are of a higher resolution and quality than the digital image delivered to the user on-screen. The file format most often associated with archival images is TIFF, or Tagged Image File Format, as compared to on-screen viewing file formats, which are usually JPEGs and GIFs.

Archival Scans
Digital images serve as surrogates of the original. At this point in time, there is no such thing as an Archival or Preservation scan that acts as an exact replica or replacement of the original, as it is not yet possible to record every piece of information found in the original with today's scanner technology.

Archive
In Information Technology terms, "to archive" an electronic file is to create a backup copy of it for noncurrent, but not permanent, storage.

In Archival terms, "to archive" an electronic record is to capture it for permanent retention. In these documents, we are using the archival definition.

Archiver
A file compression utility, such as PKZIP, which allows files to be compressed for faster uploading and downloading or to save disk space.

Archiving
Removing information from on-line to off-line storage, often using a hierarchy of storage devices (i.e., electronic imaging disk, magnetic disk, disk caches, etc.).

Artifacts
Visual digital effects introduced into an image during scanning that do not correspond to the original image being scanned. Artifacts might include pixellation, dotted or straight lines, regularly repeated patterns, moire, etc.

Aspect Ratio
The proportion of an image's size given in terms of the horizontal length verses the vertical height. An aspect ratio of 4:3 indicates that the image is 4/3 times as wide as it is high.

Audit Trail
A record of transactions in an information system that provides verification of the past activity of the system and makes it possible to "roll back" the system to a previous historical state.

B

Backfile Conversion
A process of scanning, indexing and inspecting a large existing collection of documents.

Backup
The process of making duplicate copies of electronic records, typically for security reasons. Not the same as the process of archiving a record. Backups of electronic information are made in case of equipment failure, etc. to ensure the availability of active records for ongoing administrative purposes.

Bandwidth
The range of frequencies, expressed in hertz (Hz), that can pass over a given transmission channel. The bandwidth determines the rate at which information can be transmitted through the circuit. The greater the bandwidth, the more information that can be sent through the circuit in a given amount of time.

Binary
A coding or counting system with only two symbols or conditions (off/on, zero/one, mark/space. High/low). The binary system is the basis for storing data in computers.

Binary scanner
A scanner that records each pixel as only black or white.

Bit
Abbreviation for binary digit; the smallest unit of information recognized by a computer. A fundamental digital quantity representing either 1 or 0 (on or off).

Bit Mapping
A process of scanning a document to convert it to binary codes, representing either black or white pixels, which are recorded on an optical disk or magnetic media for electronic display of the document image. Also called raster scanning, digitizing, or simply scanning.

Bits Per Inch (BPI)
A measure of the density of data on magnetic tape.

Bit Plane
A hypothetical 2-D plane containing a single bit of memory for each pixel in a image. If each 8-bit pixel is thought of as a stack of 8 coins, and an image as many rows and columns of these stacked coins then the 3rd bit plane would be the plane consisting of the 3rd coin from each stack.

BMP
File format extension for bitmap images. Format originator: Microsoft Corporation 16011 NE 36th Way, Box 97917/Redmond, WA 98073

Bounding Rectangle
The smallest rectangle that fits around a given object. In imaging the rectangle is usually rotationally restricted to be parallel to both image axes.

Brightness
The value of a pixel in an electronic image, representing its lightness value from black to white. Usually as brightness levels ranging in value 0 (black) to 255 (white).

Byte
A sequence of adjacent binary digits that are operated upon as a unit and constitute the smallest addressable unit of data in a computer.

C

Calibration
The act of adjusting the color of one device relative to another, such as a monitor to a printer, or a scanner to a film recorder. Or, it may be the process of adjusting the color of one device to some established standard.

CCD Array (Charge-Coupled Device array)
Light sensitive diodes used in scanners and digital cameras that sweep across an image during capture and, when exposed to light, generate a series of digital signals that are converted into pixel values.

CCITT
International Telegraph and Telephone Consultative Committee (predecessor of UTI).

CD
The abbreviation for compact disc, a laser-encoded plastic medium designed to store a large amount of data. A variety of CD formats are available for use by computers.

CD drive
A drive mechanism for recording or playing CD's. The most common types are CD-ROM, MO (magneto-optical), and WORM (Write Once, Read Many).

CD-E
CD-Erasable, is an electronic imaging platter that can be erased and rewritten. Synonymous with rewritable disk, but not to be confused with CD-R disk, which is recordable once only.

CD-R
An electronic imaging platter that can be recorded by the user with relatively low-cost equipment. Like WORM disks, once recorded, CD-R may not be erased or rewritten.

CD-ROM (Compact Disc, Read-Only Memory)
A non-rewritable CD used by a computer as a storage medium for data.

CERN
A European high-energy physics research center where the World Wide Web was originally implemented. Stands for Conseil Europeen Pour le Recherche Nucleaire

Channel
One piece of information stored with an image. True color images, for instance, have three channels-red, green, and blue.

Chroma
The color of an image element (pixel). Chroma is made up of satuation + hue values, but separate from the luminance value.

Chroma-key
An image blending function which replaces pixels of a specified hue range with pixels from a second image. This is often referred to the weatherman effect because most weather forecasters use a solid blue or green background to make it look as if they are

standing in front of a huge weather map. It is important to remember that it is the hue that is used in the blending function and not the intensity or saturation.

Client/Server
A form of distributed computing in which tasks and computing power are divided between an intelligent workstation or PC (client) and networked host computers (servers).

Clip Art
Graphic files that can be inserted into documents, presentations, and projects.

COLD (Computer Output to Laser Disk)
The storage on optical disk of coded data generated by a host computer. COLD replaces COM (Computer Output to Microfilm) as a mainframe storage medium.

Compressed file
An image file that has been electronically reduced in size for storage purposes. Smaller file sizes are generally preferred to maximize storage media use and to facilitate faster data access.

Compression
The method by which redundant digital image data streams are reduced to much smaller sizes, resulting in lowered digital storage and data transmission requirements.

The reduction of data to reduce file size for storage. Compression can be “lossy” (such as JPEG) or “lossless” (such as TIFF LZW). Greater reduction is possible with lossy compression than with lossless schemes.

Compression/Decompression
The reduction of image file size for processing, storage, and transmission. The quality of the image may be affected by the compression techniques used and the level of compression applied. Decompression is the process of retrieving compressed data and reassembling it so that it resembles its original form before compression. There are two types of compression:

- **Lossless** compression is a process that reduces the storage space needed for an image file without loss of data. If an image has undergone lossless compression, it will be identical to the image before it was compressed. Primarily used with bitonal images.
- **Lossy** compression is another process that reduces the storage space needed for an image file, but it discards information (information that is "redundant" and not perceptible to the human eye). If an image that has undergone lossy compression is decompressed, it will differ form the image before it was compressed, even though the difference may be difficult for the human eye to detect.

There are both standard and non-standard compression techniques available. In general, it is better to employ a compression technique that is supported by standards, non-proprietary, and maintained over time. In selecting a compression technique, it is necessary to consider the attributes of the original. Some compression techniques are designed to compress text, others are designed to compress pictures.

Computer Output Microfilm (COM)

Process of recording computer digital output directly onto microfilm or fiche.

Compression Ratio
The ratio of a file's uncompressed size over its compressed size.

Continuous-tone
An image containing various gray shades, requiring half-toning and gray-scaling techniques for best image reproduction. Photographs are continuous-tone, as opposed to a written page, which tends to be two-tone (only black and white).

Contrast
A measure of rate of change of brightness in an image.
-High contrast implies dark black and bright white content;
-Medium contrast implies a good spread from black to white;
-Low contrast implies a small spread of values from black to white.

Conversion
To change backlog documents (through the use of scanning) into some form of electronic imaging media.

Convolution
An image processing operation which can be used to spatially filter an image. A convolution is defined by a kernel which is a matrix of fixed numbers. The size of the kernel, the numbers within it, and a single normalizer value define the operation that will be applied to the image. The kernel is applied to the image by placing the kernel over the image to be convolved and sliding it around so that it is centered over every pixel in the original image. At each placement the numbers (pixel values)from the original image are multiplied by the kernel number which is currently aligned above it. The sum of all these products is tabulated and divided by the kernel's normalizer. This result is placed into the new image at the position of the kernels center. The kernel is then translated to the next pixel position and the process repeats until all image pixels have been processed. As an example a 3x3 kernel holding all '1's with a normalizer of 9 performs a neighborhood averaging operation. Each pixel in the new image is the average of its 9 neighbors from the original coordinates. A pair of numbers which represent a specific location in a two-dimensional plane such as an image or on a map. See also absolute, device, Cartesian, polar, relative, screen, and world, coordinates.

COTS (Commercial Off-The-Shelf software)
Ready-made, shrink-wrapped software that is not customized for use except through the use of built-in settings.

Crop
An image processing method of removing the region near the edge of the image, but keeping a central area.

D

DASD
Direct Access Storage Device, which is a basic type of storage medium that allows data to be accessed by positioning the medium or accessing mechanism directly at the storage location. The time required for such access is independent of the location of the data most recently accessed. Synonym for random access. File organizations can be sequential, direct, or indexed sequentially.

DDB (Device Dependent Bitmap)
A Window image specification which depends on the capabilities of a specific graphics display controller. Since a DDB is matched to the current graphics controller, it is fast and easy to display since large blocks of its memory need only be copied to the controller. See also DIB.

DBMS (Database Management System)
a) Software that controls the organization, storage, retrieval, security, and integrity of data in a database and then integrates with application programs and computer hardware.

DTD (Document Type Definition) Archival quality
A medium that can be expected to permanently retain its original characteristics and can be expected to resist deterioration. Durability refers to certain lasting qualities with respect to folding, tear resistance, etc. Archival quality is controlled by national standards.

A type of file associated with SGML and XML documents that defines how the markup tags should be interpreted by the application presenting the document. The HTML specification that defines how Web pages should be displayed by Web browsers is one example of a DTD.

Data
Any form of information, whether in paper or electronic form. In electronic form, data refers to files containing such material as database tables, text documents, images, and digitally-encoded voice and video.

Database
A collection of digitally stored data records; more formally, a collection of data elements arranged as "records" within "tables" that have specifically defined relationships with other records within other tables.

Data Compression
A group of hardware-based and/or software-based techniques that are designed to reduce the amount of storage space required for a given quantity of information.

Data Dictionary
List of all the data elements stored in a database, with descriptions, definitions, relationships, and information about which reports or other application programs use the data.

Data Migration
The preservation of access to electronic data over time by copying it from one medium or format to another, preserving its content and relationships.

Data Processing Software
The programs and routines used to employ and control the capabilities of data processing hardware, including, but not limited to, operating systems, compilers, assemblers, utilities, library routines, maintenance routines, applications and computer networking programs.

Data Set
A data file or collection of interrelated data.

Decompression
When an image or other digital data set is compressed and stored, it is not usable until it is decompressed into it original form.

Densitometer
A tool used to measure the amount of light that is reflected or transmitted by an object.

Derived Image (Derivative Image)
An image that has been created from another image through some kind of automated process, usually involving a loss of information. Techniques used to create derived images include sampling to a lower resolution, using lossy compression techniques, or altering an image using image processing techniques.

Device Coordinates
The coordinates of the coordinate system that describe the physical units by which the computer screen is defined.

Device Dependent (software)
Software that was written to work on a specific set of hardware platforms. Since these routines make use of physical device attributes, that may not exist or that may behave differently on other devices, they will most often not work on other devices. See device independent and DIB.

Device Driver
A set of low-level software routines which work with and control a specific hardware device. The names and functions are often standardized across many similar devices. This allows higher level software to use the hardware as a generic device. This frees the higher level software from dealing with the particulars of the specific devices and allows device to be interchanged easily.

Device Independent
Software or data structures that have been designed specifically to work with or on a wide set of hardware platforms. See device dependent and DIB.

DIB (Device Independent Bitmap)
Windows defined image format specification. It is called device independent because of its straightforward, common-denominator, format. It has all the information that a

basic digital image needs and is laid out in a simple specification that is easy to get at. Its simplicity makes it an ideal format for holding images that need to be shared by several programs. See also DDB, and the book *Programming Windows* by Charles Petzold.

Digital
A system or device in which information is stored or manipulated by on/off impulses, so that each piece of information has an exact or repeatable value (code).

Digital Camera
Copystand scanners that resemble microfilming stands. The digital camera directly captures an image without the use of film. Source material is placed on the stand and the camera is moved up or down in order to fit the material into its field of view, which allows for the scanning of a range of differently-sized materials. Resolution of digital cameras is usually fixed and is expressed as a pixel ratio.

Digital Image
An electronic photograph scanned from an original document, made up of a set of picture elements ("pixels"). Each pixel is assigned a tonal value (black, white, a shade of gray, or color) and is represented digitally in binary code (zeros and ones). The term "image" does not imply solely visual materials as source material; rather, a digital image is simply a representation of whatever is being scanned, whether it be manuscripts, text, photographs, maps, drawings, blueprints, halftones, musical scores, 3-D objects, etc.

Digital Projector
A device that connects to a computer via cabling to enable the computer monitor display to be enlarged and projected onto a screen.

Digitization
The process of converting analog information into digital format for use by a computer.

Digitize
The process of electronically converting an analog image or document to a bitmap image by electronic scanning.

Digitizer
An alternate name for an electronic image scanner which “digitizes” or “raster scans” a document image.

Diodes
Light-sensitive electronic components used by the scanner during image capture. Diodes sense the presence or absence of light and create a digital signal that the computer then converts into pixel values.

Directory
An organizational view of the files or electronic documents present on a computer, generally implemented as a hierarchical structure to make them easier to find.

Directory, Current
The directory the system is currently using.

Directory, Root
The top directory in a hierarchical file system, from which all other directories branch out.

Directory, Shared
A directory to which two or more specified employees have both read and write access.

Disc
Term used to describe optical storage media (video, disc, laser, disc, compact disc), as opposed to magnetic storage systems.

Disk
Term used to describe magnetic storage media (floppy disk, diskette, hard disk), as opposed to optical storage systems.

Dithering
The method of using neighborhoods of actual display pixels to represent one image intensity or color. This method allows low intensity resolution display devices to simulate higher resolution images. For example, a binary laser printer can use block patterns to display gray-scale images. See also Half-tone.

Document
a) A material object upon which information is written, transcribed, or recorded.

b) The information created by one or more applications and stored on a PC. Used interchangeably in IT contexts with "record" or "file."

Documentation
The act or process of substantiating by recording actions and/or decisions.

a) Records required to plan, develop, operate, maintain, and use electronic records and software, including, but not limited to, systems specifications, file specifications, codebooks, record layouts, user guides, and output specifications.

b) The act or process of substantiating actions and/or decisions. To IT it means providing complete annotation for a computer system.

Dots per inch (dpi)
A measurement of the scanning resolution of an image or the quality of an output device. DPI expresses the number of dots a printer can print per inch, or that a monitor can display, both horizontally and vertically. DPI is linked to pixel sizes, with smaller pixels yielding higher dpi and increased image definition

In scanning, a measurement of resolution – the number of pixels a scanner can physically distinguish in each vertical and horizontal inch of an original image

Download
The transfer of files or other information from one piece of computer equipment to another.

Drive
An electromechanical device that spins disks and tapes at a specified speed. Also refers to the entire peripheral unit such as disk drive or tape drive.

Driver
A software utility designed to tell a computer how to operate an external device. For instance, to operate a printer or a scanner, a computer will need a specific driver.

DTD
Document Type Definition. Documents are regarded as having types, just as other objects processed by computers do. The type of a document is defined by its constituent parts and structure. A DTD defines the structure of an SGML (Standard Generalized Markup Language) document and ensures that all the documentation is formatted the same way.

Dublin Core
International metadata standard consisting of a 15-element set for describing a wide range of resources pertaining to the creation of a document.

Dynamic Range (Bit-depth)
The number of colors or shades of grey that can be represented by a pixel. The smallest unit of data stored in a computer is called a bit. Dynamic range is a measurement of the number of bits used to represent each pixel in a digital image. **1-bit or bitonal** means that a pixel can either be black or white. Bitonal imaging is good for black and white images, such as line drawings and text. However, scanning in grayscale rather than bitonal may produce a better looking image. **8-bit color** or **8-bit grayscale** means that each pixel can be one of 256 shades of color or one of 256 shades of gray. **24-bit color** means that each pixel can be one of 16.8 million colors.

E

Edge
In an image an edge is a region of contrast or color change. Edges are often useful in machine vision since optical edges often mark the boundary of physical objects.

Edge Detection
A method of isolating and locating an optical edge in a given digital image.

Edge Map
The output of an image processing filter that transforms an image into one where intensity represents a change in the contrast (optical edge) of the original.

Eight (8)-bit Image
An image where each pixel has 8 bits of information in it. An 8-bit pixel can take on one of 256 possible values. There are two common types of 8-bit images: gray scale and indexed color. In gray-scale images each pixel takes on one of 256 shades of gray and the shades are linearly distributed from 0 (black) to 256 (white). An 8-bit gray-scale image doesn't require a palette but may have one anyway. An indexed color

image is always a palette image. Each pixel is used as an index into the palette. Thus these images can have up to 256 different colors in them at one time. This includes hues as well as shades. Indexed 8-bit images are good for low color resolution images that will not need to be processed later on. They are 3x's smaller than full-color RGB images, but because the pixel values are not linear many image processing algorithms cannot work with them. They must be promoted to 24 bit first.

Electronic imaging disk or **electronic imaging platter**
A noncontact, random-access disk tracked by optical laser beams and used for mass storage and retrieval of digitized text and graphics.

Note to Reviewers: If this is still something that is in theory, should we include it in these guidelines?

Software that manages electronic documents for some business purpose (EDMS). Such software may also include records management functions (EDMS/RM).

Electronic Record
Record containing machine readable, as opposed, to human-readable information and consisting of character-coded electronic signals that can be processed and read by means of computers

Email (Electronic Mail)
The process of sending and receiving messages in electronic form from one electronic device to another via communications network.

Encoding
The manner in which data is stored when uncompressed (binary, ASCII, etc.), how it's packed (e.g. 4-bit pixels may be packed at a rate of two pixels per byte), and the unique set of symbols used to represent the range of data items.

Encryption
Encoding data for security purposes.

Enhancement
Refers to the use of mathematical algorithms to improve the quality of digitally scanned images. The term also includes techniques that may be used to modify the scanned image for structural reasons, such as bordering to remove any unwanted scanned areas surrounding the actual document page, de-skewing to rectify the scanned image to correct for any skew in the placement of the document on the scanner, or margin adjustment to ensure that pages are properly aligned with each other.

Enterprise Data
Centralized data that is shared by many users throughout the organization.

Ethernet
A local area data network that is a contention based protocol. An individual station "listens" for an all clear signal in order to gain access to the network. Once access to

the network has been granted then the station broadcasts its message and releases the network when the transmission is finished.

Export
The process of transporting data from one computer, program, type of file format, or device to another.

F

Fiber Optics
An optical system that uses glass or transparent plastic fibers as light transmitting media.

Field
A category of information that contains data itmes ina database. Also, referred to as an attribute**.**

File Format
A type of program or data file. Some common image file formats include TIFF, PICT, and EPS. The format dictates what information is present in the file and how it is organized within it.

Filename
In PC-based electronic record keeping systems, the name assigned to an individual document filed within the system, which serves as the means of retrieving it. May be combined with a “filename extension” to provide a more descriptive document identifier.

File Server
A computer that serves as the storage component of a local area network and permits users to share its hard disks, storage space, files, etc.

File Size
The file size of an image is proportional to its resolution. The higher the resolution, the bigger the file size. File size is different from image size.

Filter
An image processing filter is a transform which removes a specified quantity from an image. For instance a spatial filter removes either high, medium or low spatial frequencies from an image.

FTP (File Transfer Protocol)
The most frequently-used protocol on the Internet for transferring files between servers.

Flatbed Scanner
Scanner design in which the document is placed on a glass surface similar to placing an item on the glass of a photocopier. This allows for the scanning of materials that cannot be fed through an automatic document feeder.

Floppy Disk
Typically, a removable computer storage medium consisting of a thin flexible plastic disk, coated with a magnetic material on both sides. The most common type, a 3.5-inch, is protected by a plastic case.

Four (4)-bit Image
An image file format which allows for 4-bits per pixel. Such an image can contain up to 16 (24)different colors or levels of gray within it at one time.

G

Gain & Level
Gain and level are image processing terms which roughly correspond to the brightness and contrast control on a television. The gain is the "contrast", and the level is the " brightness" . By changing the level the entire range of pixel values are linearly shifted brighter or darker. Gain on the other hand linearly stretches or shrinks the intensity range, thus altering the contrast.

GIF File Format
Stands for Graphic Interchange Format, a raster oriented graphic file format developed by CompuServe to allow exchange of image files across multiple platforms.

Gigabyte (GB)
A measure of computer memory or disk space consisting of about one thousand million bytes (a thousand megabytes). The actual value is 1,073,741,824 bytes (1024 megabytes).

Gray Level
The brightness of a pixel. The value associated with a pixel representing it's lightness from black to white. Usually defined as a value from 0 to 255, with 0 being black and 255 being white.

Gray Scale
A range of shades of gray in an image. Gray scales of scanners are determined by the number of grays, or values between black and white, that they can recognize and reproduce. Usually requires increased storage in digital systems to capture more shades of gray.

H

Half-tone
A way of representing gray-scale or color graphic objects as a series of dots. Half-toning can create the illusion of gray-scale.

Hard Disk Crash
The failure of a microcomputer's internal storage device, resulting in the instant destruction of all documents and data residing on the disk.

Hardware
The physical computer equipment, including computers, printers, and networking equipment.

Histogram
A bar graph analysis tool that can be used to identify contrast and dynamic range image problems. Histograms are found in most software programs that are used to manipulate digital images.

Histogram
A tabulation of pixel value populations usually displayed as a bar chart where the x-axis represents all the possible pixel values and the y-axis is the total image count of each given pixel value. That is, a histogram counts how many pixels in the image have a given intensity value or range of values. Each histogram intensity value or range of values is called a bin. Each bin contains a positive number which represents the number of pixels in the image that fall within the bin's range. A typical 8-bit gray-scale histogram contains256 bins. Each bin has a range of a single intensity values. Thus, bin 0 contains the number of pixels in the image that have a gray-scalevalue of 0 or black. Likewise, bin 255 contains the number of white (255) pixels. When the collection of bins are sorted (0-255) and charted, the graph displays the intensity distributions of all the images pixels.

HSL (Hue Saturation, and Lightness)
A method of describing any color as a triplet of real values. The hue represents the color or wavelength of the color. It is sometimes called tone and is what most people think of as color. The hue is taken from the standard color wheel and is thus calibrated in degrees about the wheel. Saturation is the depth of the color. It states how gray the color is. It is areal valued parameter from 0.0 to 1.0 with 0.0 indicating full gray and 1.0 representing pure hue. The lightness is how black or white a color is. It also ranges from 0.0 to 1.0 but with 0.0 representing black and 1.0 white. A lightness of 0.5 is pure hue.

HTML (Hypertext Markup Language)
The markup language used to prepare documents for delivery on the World Wide Web. HTML is the name of the Document Type Definition in SGML, and all web servers and browser clients are programmed to recognize it.

Human-readable Storage Medium
Material on which data can be stored that doesn not require a computer to access/read the data including but not limited to paper, photograph, photocopy, or microform, computer output microfilm, and aperture cards.

Hypermedia
An extension of hypertext that supports linking graphics, sound, and video elements in addition to text elements. The World Wide Web is a partial hypermedia system since it supports graphical hyperlinks and links to sound and video files. New hypermedia systems under development will allow objects in computer videos to be hyperlinked.

Hypertext
An idea first described by Ted Nelson in the 1960s, in which objects (text, pictures, music, programs, and so on) can be creatively linked to each other. Since that time this idea has been implemented as the World Wide Web, which remains its most familiar example. When you look at a given object, you can see all the links to other objects that are linked to it. You can move from one object to another via the links, even though they may be stored on far distant computers or have very different forms. For example, a webpage with links to images or music stored on another web server in another country.

I

ICR (Intelligent Character Recognition)
The ability of software to recognize and translate bit mapped scans or faxes of hand printed or machine printed or machine printed alphanumeric characters into machine-readable text.

Image
An electronic data file consisting of digital data that, when reconstructed either on a display screen or hard-copy print, appears as the original document.

Image Capture
Using a scanner or other device to create a digital representation or electronic photograph of an image. The scanning process is often labor-intensive and costly, requiring a substantial investment in handling and processing original materials and their surrogate images. The current strategy is to capture an image at the highest resolution appropriate to the original, and store it off-line as an archival image on CD-ROM or magnetic tape. Techniques such as lossy compression and subsampling can then be used to create derivative images for use online. In the future, as the ability to deliver high-quality archival scans develops, it will be possible to place the archival scan online without cost of recapture. Scanning can be done in-house or contracted out to a vendor. Whether scanning is done in-house or outsourced, quality of the images can vary widely. Image specifications should be stated clearly in the contract with the vendor and sample images (at varying resolutions) of the materials to be scanned should be requested of the vendor prior to the start of the project.

Image File
Electronic file that contain computer-processible images of documents for storage on magnetic or optical media.

Image folder
Multiple images, often scanned at different times, electronically linked so as to be either accessible as a unit or individually. An image folder is analogous to a file folder in a manual system.

Image Format
Refers to the specification under which an image has been saved to disk or in which it resides in computer memory. There are many commonly used digital image formats in use. Some of the most used are TIFF, DIB, GIF, and JPEG. The image format specification dictates what image information is present and how it is organized in memory. Many formats support various sub-formats or 'flavors'.

Image Processing
The general term "image processing" refers to a computer discipline wherein digital images are the main data object. This type of processing can be broken down into several sub-categories, including: compression, image enhancement, image filtering, image distortion, image display and coloring, and image editing.

Image Manipulation or Alteration
Making changes (such as tonal adjustments, cropping, moire reduction, etc.) to an image using image processing software.

Image Processing
Capturing and manipulating images in order to enhance or extract information.

Image Resolution
The number of pixels per unit length of image. For example, pixels per inch, pixels per millimeter, or pixel wide.

Image size
Describes the actual physical dimensions of an image, not the size it appears on a given display device.

Imaging
The capability to capture, store, retrieve, display, process, manipulate, and distribute a digital representation of a document, person, or thing.

A term used to describe the process of recording an image of a document on either microfilm or optical disk.

Imaging Document
The process of creating an exact image of a document utilizing either electronic or photographic technology.

Imaging system
a) Hardware and software for computers which record complete images by the integration of digital scanning technology, high-density storage on an electronic imaging recording medium, indexed rapid retrieval, and the ability to reproduce the entire original image.

b) A computer based digital system used to store documents and records electronically by recording a digital reproduction of a scanned document or record and a suitable method of indexing and retrieving the stored images.

Import
The process of bringing data into a document from another computer, program, type of file format, or device.

Indexed Color Image
An image where each pixel value is used as an index to a palette for interpretation before it can be displayed. Such images must, therefore, contain a palette which has been initialized specifically for a given image. The pixel values are usually 8-bit and the palette 24-bit (8-red, 8-green, and 8-blue). See also eight-bit image.

Indexing
Assignment of physical location and document identification information (e.g., date, creator, contents) to search for and retrieve desired images.

Integration
Combining various pieces of hardware and software, often acquired from different vendors, into a unified system; (b) combining computer programs into a unified software package so that all programs can share common data.

ISO
The International Organization for Standardization, which coordinates national standards worldwide.

J

JPEG (Joint Photographic Experts Group)
A compression algorithm for condensing the size of image files. JPEGs are helpful in allowing access to full screen image files on-line because they require less storage and are therefore quicker to download into a web page. JPEG is usually a lossy compression.

Jukebox
An electronic imaging disk storage system that utilizes robotic devices containing shelves and automated picking mechanisms to store multiple disks and provide automatic digital image delivery.

K

Kilobyte
An amount of computer memory, disk space, or document size consisting of approximately on thousand bytes. Actual value 1024 bytes.

L

LAN (Local Area Network)
The interconnection of computing devices within a defined and relativaley limited geographical area, thus permitting the sharing of electronic records and other computing resou

Legal value
In records appraisal, the usefulness of a record in complying with statutes and regulations, as evidence in legal proceedings, or as legal proof of business transactions.

Long-term value or **long-term record**
A document which must be retained for 10 years or more.

Lossless Compression
Reduces the size of files by creating an internal shorthand that rebuilds the data as it originally were before the compression. Thus, it is said to be non-destructive to image data when used.

A method of image compression where there is no loss in quality when the image is uncompressed. The uncompressed image is mathematically identical to its original. Lossless compression is usually lower in compression ratio than lossy compression.

Lossy (image compression)
A method of image compression where some image quality is sacrificed in exchange for higher compression ratios. The amount of quality degradation depends on the compression algorithm used and a user selected quality variable.

A method of reducing image file size by throwing away unneeded data, causing a slight degradation of image quality. JPEG is a lossy compression method.

LPI (Lines Per Inch)
The frequency of horizontal and vertical lines in a halftone screen.

M

Magnetic Disk
A platter-shaped device used for storage of electronic records in computer systems; generally used in high performance computing environments requiring very rapid, on-line access to electronic records. A direct access storage device

Magnetic Media
A general term which refers to a variety of devices on which computer-based records are stored. These media are un? With a ferromagnetic recording material on which the electronic records reside. The most common electronic media magnetic disks, diskettes and magenetic taper.

Magnetic Tape
A strip of plastic film coated with a magnetic recording material and wound onto reels of various sizes; used for the off-line storage of electronic records in computer systems.

Medium
The physical form of recorded information: paper, film, disk, magnetic tape, and other materials on which information can be stored and recorded.

Megabyte (MB)
An amount of computer memory consisting of about one million bytes. The actual value is 1,048,576 bytes.

Metadata
a) Data that describe other data. The term may also refer to any file or database that holds information about another database's structure, attributes, processing, or changes. Usually includes information about the intellectual content of the image, digital representation data, and security or rights management information.

b) Documentation of information and data about the imaging system hardware, software and storage file systems.

Micrographics
The techniques associated with the production and handling of microfilm, microfiche, and related storage technologies based on retaining a photographic representation on film.

Microform
The generic term covering all forms of micrographics, such as film, fiche, aperture cards, etc.

Migration
Preserving the integrity of digital images by transferring them across hardware and software configurations and across subsequent generations of computer technology. Migration includes refreshment (copying digital files from one media to another) as a means of preservation and access. However, migration differs from refreshment in the sense that it is not always possible to make an exact copy of a database or even an image file as changes in hardware and software occur and still maintain compatibility with the new generation of technology.

Modem (MODulator/DEModulator)
A device that converts digital computer data into signals for transmission over telephone or lines.

Morphing
An imaging process where one image is gradually transformed into a second image, where both images previously exist. The result is a sequence of in-between images which when played sequentially, as in a film loop show, give the appearance of the starting image being transformed to the second image. Morphing is made up of a

collection of image processing algorithms. The two major groups are: warps and blends. Not to be confused with morphology.

Morphology
A neighborhood image processing algorithm similar to image convolution except that Boolean logic is applied instead of arithmetic. There are two types of morphology, binary and gray-scale. Both have similar operation but are carried out differently because of the data width. The four major operations are; erosion, dilation, opening, and closing. Erode - a filter which tends to make bright objects smaller. Dilation - a filter which tends to make bright objects larger. Opening - an erosion followed by a dilation. Closing - a dilation followed by an erosion. Not to be confused with morphing.

MPEG (image compression)
Motion Pictures Experts Group. An ISO specification of the compression of digital-broadcast quality full-motion video with its sound track.

N

Network

a) The interconnection of several computers to each other or to a single host computer system.

b) A group of computers connected to communicate with each other, share resources and peripherals.

Near Line Storage
The storage of optical disks or other computer media in a jukebox or other retrieval device which provides rapid, unattended access to the electronic records resident on the media.

Noise
Data or unidentifiable marks picked up in the course of scanning or data transfer that do not correspond to the original.

O

OCR (Optical Character Recognition)
A technology that can analyze a bit-map of printed or written characters, determine what the characters are, provide them as direct input to a computer system. This permits capturing input data at the entry source, bypassing additional processing operations.

A method of entering data into a computer by using an optical scanning device to read the contents of the document.

Off-site Location
A location, either physical or virtual, that is separate and apart from the premises, building, or structure that houses and agency's primary imaging system.

One (1) bit image
The lowest number of colors per pixel in which a graphic file can be stored. An image comprised of pixels that contain only a single bit of information. Each pixel is either on or off. Normally, "on" is white and "off" is black.

Open System
A system with characteristics that comply with specified, publicly maintained, readily available standards and that therefore can be connected to other systems that comply with those same standards.

Operating System
The set of programs that control the functioning of application programs in a computer. It is the software that runs the computer system and performs functions needed to control system operations. Such functions include input/output, storage assignment tasks, and compiling. Operating systems at all scales include UNIX, IBM's OS/2, Solaris, Windows NT, Windows 98, etc.

Optical Disk
A platter-shaped device for the storage of very large quantities of electronic documents and data in computer systems. Optical media utilize high concentrations of laser light as the method of recording the information on the disk platters. In records management applications, optical disks are typically utilized for the storage of high volumes of electronic documents and data requiring very rapid on-line or near-line retrieval. Optical disks are available in erasable and non-erasable formats. Initially called an Optical Digital Disk, but most frequently referred to simply as an Optical Disk.

OSI
Open Systems Interconnection, a framework for network standardization developed by the International Standards Organization (ISO). The basic model consists of seven layers:

1. Physical Layer: provides the mechanical and electrical interface.
2. Data Link Layer: transmits packets of bits between two points, with error detection.
3. Network Layer: addresses and routes message packets.
4. Transport Layer: ensures error-free transmission of message packets.
5. Session Layer: controls the sequencing of message packets that constitute a networking session.
6. Presentation Layer: provides services such as encryption and translation between different data- representation codes.
7. Application Layer: interacts with the user.

Overlay
An image or sub-image that can be placed over a given image. The pixels from the original image are not altered but the overlay can be viewed as if they had been. Usually used to place temporary text and annotation marks such as arrows on a image.

P

Packed Bits
A binary image is usually stored in computer memory 8 pixels per byte. When this is the case each byte is referred to as being filled with packed bits This saves space but makes reading and writing any individual pixel somewhat harder since most computers cannot directly access memory in chunks smaller than a byte.

Palette
A digital images palette is a collection of 3 look-up-tables or "LUT"s which are used to define a given pixels display color. One LUT for red, one for green and one for blue. The number of entries in the LUTs depends on the width in bits of the image's pixels. A palette image is one which requires its palette in order to be displayed in a fashion which makes sense to the viewer. This is often the case of color 8-bit images. Without a palette describing what color each pixel is to be displayed with, such an image would most likely be displayed as randomly selected noise. A gray-scale palette is one where each of the 3 LUTs are linear. That is, the output is whatever is input to them. Since each color component (R, G, B) will be an equal value, any pixels input to them will be displayed in a varying shade of gray. See also Look-Up-Table

Pattern recognition
A sub-discipline of machine vision where images are searched for specific patterns. Optical character recognition or "OCR" is one type of pattern recognition, where images are searched for the letters of the alphabet.

Permanent records
Records having sufficient historical or other value to warrant continued preservation by the State Government beyond the time they are needed for a particular agency's administrative, legal, or fiscal purposes; sometimes called archival records.

Pixel (PICture Element)
The smallest element of a digitized image. Also, one of the tiny points of light that make up a picture on a computer screen.

Posterize
A special effect that decreases the number of colors or gray-scales in an image. The default image pixel contains 256 levels of gray or 256 levels of red, green, and blue. Using this effect reduces these numbers.

Preservation
(As it relates to scanning) Digitizing an original photograph, document, or three-dimensional object is only a method of preservation if the digital file becomes the access tool and the original is no longer available for use. Although high resolution scanning (i.e., scan at the highest resolution possible appropriate to the type of media you are scanning) is recommended for all materials in order to achieve the highest quality possible and to ensure that information held in the original is not lost in the scan. However, the digital file, as of yet, should not serve as a replacement of the original for preservation purposes.

Pseudocolor
A method of assigning color to ranges of a gray-scale image's pixel values. Most often used to highlight subtle contrast gradients or for visually quantifying pixel values. The applied color usually has no correspondence to the original, physical imaged scene. The colors are used only as a guide or highlight.

Q

Quality Control
Techniques ensuring that high quality is maintained through various stages of a process. For example, quality control during image capture might include comparing the scanned image to the original and then adjusting colors or tonal values, or checking for artifacts.

R

RAM (Random Access Memory)
The most common type of computer memory; where the CPU stores software, programs, and data currently being used. RAM is usually volatile memory, meaning that when the computer is turned off, crashes, or loses power, the contents of the memory are lost. A large amount of RAM usually offers faster manipulation or faster background processing.

Raster
Raster images are made up of individual dots; each of which have a defined value that precisely identifies its specific color, size and place within the image. Also known as bitmapped images.

Records or **public records**
Any documentary materials, regardless of physical form or characteristics, made or received by a state agency in connection with the transaction of public/ official business and preserved for the informational value or as evidence of a transaction or as evidence of the organization, functions, policies, decisions, procedures, operations, or other activities of the Government and all other records or documents required by law to be filed with or kept by an agency of the State.

Records, Current
Records necessary to conduct the day-to-day business of an office and therefore generally maintained in local office space and on local equipment.

Redaction
The editing done to sensitive documents before release to the public in order to comply with privacy/legal requirements.

Refreshment
The transfer of digital files to a new media on a regular basis. This is the most important part of an institution's long-term commitment to digitization. Technology is

usually outdated by the time it hits the marketplace. The data we generate today must be retrievable five, fifty, and a hundred years from now. In order to ensure long-term access to the data, it must be transferred to the most recent and stable type of media storage. In a hundred years, it is very unlikely that any of the computers on our desks today will function. We must make sure that the data can be retrieved by future technology.

Render
The process of displaying an image. The final and actual displayed image is said to have been rendered. The display technology (software, monitor, etc.) will have a significant impact in the rendered image, resulting in a discernable range of quality in images originating from the same file.

Resolution
The number of pixels (in both height and width) making up an image. The more pixels in an image, the higher the resolution, and the higher the resolution of an image, the greater its clarity and definition (and the larger the file size). Resolution can also refer to the output device, such as a computer monitor or printer, used to display the image. Image file resolution is often expressed as a ratio (such as 640x480 pixels), as is monitor resolution; however, resolution is also expressed in terms of dots per inch (dpi). The asssumed universal monitor resolution for web users is 72 dpi. Image file resolution and output (print or display) resolution combine to influence the clarity of a digital image when it is viewed.

There are two types of resolution in digital images; spatial and intensity. Spatial resolution is the number of pixels per unit of length along the x and y axis. Intensity resolution is the number of quantized levels that a pixel can have.

Re-writable disk
Synonymous with CD-E, an electronic imaging platter that, unlike WORM disks, can be erased, written over, or otherwise reused.

ROM (Read Only Memory)
ROM can be read and not updated or changed by the computer. Usually ROM refers to specific electronics in a computer; however non-alterable disks like CD's or CD ROM's are another type of read only memory. Read Only Memory is non-volatile. It does not disappear when power is shut off.

S

Scanner
A device used in electronic imaging, that raster scans a document to record the image on an optical disk or tape, using binary code.

SCSI (Small Computer System Interface)
A computer connection that is preferred for digital imaging because of its high speed and standard interface.

SQL (Structure Query Language)
A *de facto* standard that enables users to access a variety of databases on micros, minis, and mainframes using generic commands and syntax.

Server
A relatively high-capacity computer that is used to provide services to other ("client") computers linked together in a network.

SGML (Standard Generalized Markup Language)
A standard for how to specify a document markup language or tag set. Such a specification is a Document Type Definition (DTD). SGML is not a document language, but a description of how to specify one. HTML and XML are DTDs defined in terms of SGML.

SGML
Standard Generalized Markup Language. An international standard for the definition of device-independent, system-independent methods of representing texts in electronic form. SGML emphasizes descriptive rather than procedural markup. While HTML is a markup language which deals primarily with the appearance of a document, SGML is a more complex system for describing structural divisions in a text (title page, chapter, scene, stanza), typographical elements (changing typefaces), and other textual features (grammatical structure, etc.). The "tags" in SGML preserve the structure of a text, enable the user to constrain searches to particular structural features of the text and aid in the navigation and use of the text. More information on SGML is available at http://sunsite.berkeley.edu/SGML/

Shear
A shear is image distortion which most often occurs when a scanner is sampling am image and the image slides to either side before the scan is complete. This has the effect of transforming squares into rhombuses.

Skew
The slant of an image that prevents it from being perfectly squared on the page or screen

Software
Any program used by the computer to perform a given function.

Storage density
Is the compaction techniques used in recording information on electronic imaging disks. It is directly related to the total amount of user storage space available.

Subdirectory
A directory within another directory. Subdirectories may themselves contain subdirectories. C:\first shows that the root directory, "C", has a subdirectory within it called "first" ; C:\first\second shows the same thing and that the subdirectory first has a subdirectory "second" within it.

Subsampling
Using an algorithm to derive a lower-resolution image from a higher-resolution image.

Substrate
the physical surface of an electronic imaging disk. The substrate of an electronic imaging disk contains material used to electronically capture an image (e.g., polycarbonate, tempered glass, etc.).

Surrogate image
A representation of the original image, used for study.

T

TEI (Text Encoding Initiative)
An international project to develop guidelines for the preparation and exchange of electronic texts for scholarly research. The TEI has created a set of SGML DTDs for the encoding of humanities and social science-related texts. More information on TEI is available at http://etext.virginia.edu/TEI.html

Thirty-two (32)-Bit Color
A display resolution setting that is often referred to as true color and offers a color palette of over 16 million colors.

TIFF (Tag Image File Format)
a) A *de facto* standard file format designed to promote the interchange of digital image data. It is a bit-mapped graphics format for scanned images with resolutions of up to 300 dots-per-inch. It simulates gray-scale shading.

b) A family of bitmap file formats for describing and storing color and grayscale images.

Trustworthiness
The degree to which records containing evidence introduced or proposed for introduction in legal proceedings may be relied upon as being factual or otherwise what they purport to be.

Twenty-four (24)-Bit Color
In 24-bit color, each pixel has 24 bits assigned to it, representing 16.7 million colors. 8 bits – or one byte – is assigned to each of the red green, and blue components of a pixel.

U

URL (Uniform Resource Locator)
A standard addressing scheme used to locate or reference files on the Internet. Used in World Wide Web documents to locate files. A URL gives the type of resource being used and the path to the file. The syntax used is: scheme://host.domain/path filename.

URN (Universal Resource Name/Number)
A storage-independent scheme to name all resources on the Internet with a unique and fixed name. URNs are likely to supersede URLs for identification and referencing of networked resources.

V

Vital records
Records containing information required to re-establish or continue an organization in the event of a disaster; records containing unique and irreplaceable information necessary to recreate an organization's legal and financial position and preserve the rights of the organization and its employees, customers, shareholders and other constituent groups. Vital records include records whose informational value to the organization is so great, and the consequences of loss are so severe, that special protection is justified in order to reduce the risk of loss. These records require some form of security backup, whether in an electronic medium, microform, or paper.

W

WAN
Wide Area Network, which is a data network connecting large numbers of nodes and LANs that are geographically remote.

Webmasters
Those who manage the information technology aspects of websites. They are most frequently found in the information systems offices of agencies engaged in acquiring and managing the agencies' information technology resources.

Website
A server that contains web pages and other files that is online to the Internet 24 hours a day.

World Wide Web (WWW)
An interconnected network of electronic hypermedia documents available on the Internet. WWW documents are marked up in HTML. Cross references or hyperlinks between documents are recorded in the form of URLs.

WORM (Write Once Read Many)
Storage media (usually recordable CD-ROM or optical disk) that is not re-writable. Information can only be written to the disk once. It is permanently stored on the disk.

WORM disk
Write-once-read-many electronic imaging disk that can store user data (*write*) and can be accessed (*read*) when needed. WORM disks cannot be erased or re-used like conventional magnetic media.

X

XML

XML is a standard to create electronic documents on the Internet. The first application of XML is to create Web pages, similar to existing ones but more dynamic. XML is not limited to only Web pages; potential documents include forms, EDI messages, channel definition (for push technology), application descriptions, etc. XML is a metalanguage (a way to define tag sets) that allows you to design your own customized markup language for many classes of documents.. XML is intended to deliver information, not just pages.. Currently, XML is being looked at for preservation of electronic records.

Z

Zip Compression

A type of file compression that decreases the total size of a file and allows larger amounts of data to be transferred in fewer bytes. A zip file typically ends with a .zip extension.

Zip Drive

A computer disk drive made of Iomega that enables users to save about one hundred megabytes of information on their special disks.

Zooming

Enlarging a portion of a digital image in order to see it more clearly or make it easier to alter.

DIGITAL DOCUMENT IMAGING:

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K. G. Saur, Reed Reference Publishing, 121 Chanlon Rd., New Providence, NJ, 07974.

ORGANIZATIONS

AIIM

Association for Information and Image Management
1100 Wayne Avenue
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(301) 587-8202
www.aiim.org/industry/standards

ARMA International

Association of Records Managers and Administrators, Inc.
4200 Somerset Drive, Suite 215
Prairie Village, Kansas 66208
(800) 422-2762
http://www.arma.org/

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Washington, DC 20408
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