Glossary

Note: Boldface terms within entries are also defined in the glossary. In some cases, separate terms (e.g., **RGB** and **color model**) that are grouped consecutively (**RGB color model**) in the main text and glossary may appear to be one term.

AAT (Art & Architecture Thesaurus)
A **controlled vocabulary** maintained by the Getty Research Institute that identifies and organizes art and architecture terminology.

access file (or access image)
A file derived from a **master file** that is used to make a **digital** collection item accessible without hazarding the master. Typically compressed to reduce storage requirements and speed **online** delivery.

access points
A **database** field or **metadata** category designed to be searchable and retrievable by an end-user. Also used to denote a place where wireless network access is available.

ACL (Access Control List)
A way to limit access to **networks** to authorized users by using a router to forward or block requests from users based on a given protocol or criteria, such as **IP address**.

adaptive palette
A reduced **palette** of colors chosen to give the best possible reproduction of an image when it is displayed in a limited or "palettized" color environment, such as an 8-bit (256-color) display, or within a 256-color image **format**, such as **GIF**.

AFRICOM (International Council of African Museums)
Body that originated as a program of the International Council of Museums (ICOM) that has developed a **metadata standard** designed to promote the standardization of museum collection inventories in Africa.

algorithm
A set of steps in a specific order, such as the instructions in a computer program. Different image **compression** schemes employ different algorithms; for instance, the **JPEG** algorithm processes images as 8 x 8 image-blocks and applies cosine transformations to each block, while the **JPEG2000** algorithm applies wavelet transformations to the image as a whole.

analog
Any continually fluctuating or changing process, or any mechanism in which data is represented by continuously variable quantities. Analog images are **continuous tone**-the range of colors or shades of gray that they can include are virtually unlimited, and therefore their colors graduate smoothly. Because data in analog form can theoretically be represented by an infinite number of values, it may be difficult to differentiate between accurate reproduction and **noise**; thus, analog technology does not facilitate the accurate creation of copies, and analog reproduction may be of lower quality than **digital** reproduction.

annotation
Commentary added to a media object, generally providing explanatory information or editorial notes regarding the media file. Annotations are a form of **metadata**.

ANSI (American National Standards Institute)
U.S.-based body that does not directly develop **standards** but coordinates and administers voluntary consensus standardization initiatives.

archival master
The raw, original image captured by the scanning process and/or an image created and managed so as to optimize longevity and future usefulness. File naming, file formatting, **color space** selection, **capture resolution**, and similar specifications should be based on documented **standards**. Archival masters may be used as the source for **access images**, or these may be created from **derivative masters.** *See* **digital preservation**.

artifact
An error introduced into an image during capture or digitization, formatting, **compression**, or other transformation processes. Most commonly used to refer to the perceptible degradation of an image after a **lossy compression** schema has been used.

ASP (Active Server PageT)
One of several methods of dynamically generating **Web** pages in response to user input that may be used to gather information from remote **databases**. Utilizes "ActiveX" scripts. A Microsoft specification that may require third-party software to run on non-Windows platforms. ASP may also indicate an Application Service Provider. *See* **CGI**, **JSP**, **PHP**.

authentication
A human or machine process that verifies that an individual, computer, or information object is who or what s/he or it purports to be. Used in allowing access to secure systems.

authenticity
Refers to the trustworthiness of a **digital** entity, to its being what it professes to be, as regards its identity, origin, history, authorship, **integrity**, and/or the accuracy with which it documents an original work. The degree to which authenticity can be ascertained or guaranteed is likely to be determined by the quality of custody or management an entity enjoys over its life cycle.

authority (or authority file)
A file or set of terms extrinsic to records describing objects or documents. A more efficient way of recording information, which need be recorded only once and may then be linked to all appropriate records.

bandwidth
Denotes the capacity of a communications channel, such as an **Internet** link. Determines how fast data can flow over the channel. *See* **bit rate**.

batch processing
The automated application of a given process, such as **compression**, to multiple files.

bit
The smallest unit of computer data, denoted by a single binary value, either 0 or 1. Eight bits make up one **byte** in most computer systems.

bit depth
Also known as **sample depth** or **color depth**. The number of bits used to describe the color value of each **pixel** in an image, which in turn dictates the number of colors available to a given media file, monitor, or other device. An 8-bit image has 256 possible colors. A 24-bit image has approximately 16 million. *See* **dynamic range**.

bitmap (or **bitmapped image, raster image)**
An image made up of a given number of **pixels**, each with a specific color value, laid out in a grid. Ideal for reproducing photographic representations, because a sufficient quality and quantity of pixels can give the appearance of a **continuous tone** image. **Resizing** will affect apparent image quality. For instance, enlarging an image involves enlarging each pixel, which entails a reduction in **resolution**. *See* **vector graphic**.

bit rate
The number of **bits** that pass a given point in a **network** in a given amount of time, generally measured in kilobits or megabits per second (Kbps or Mbps). The bit rate is a measure of **bandwidth** and may also be referred to as the data transfer rate.

Boolean
A system of logical thought developed by George Boole (1815-1864) and adopted for use with binary values of

computer operations. In Boolean searching, terms such as AND, OR, and NOT are used as operators to combine or exclude search terms.

born digital
Creations originally generated in **digital** form rather than copies or surrogates of **analog** originals, and which exist entirely in a digital environment. Examples include software, **Web** pages, hypertext fiction, and digital art.

broadband
High-speed data transmission or a transmission medium in which a wide range or band of frequencies is available to transmit data, allowing more information to be transmitted in a given time frame. As of this writing, broadband is sometimes defined as services that offer **bit rates** of 1.544 megabits per second (Mbps) and above. May also be referred to as wideband. Digital Subscriber Lines (DSLs) and cable modems allow broadband transmission. *See* **bandwidth**.

browser
See **Web browser**.

browser-safe palette
A **palette** of 216 colors whose appearance is predictable in all **browsers** and operating systems. Developed for 256-color displays-the remaining 40 colors are rendered differently by Macintosh and IBM-compatible or **Wintel** operating systems. Still used in **Web** design.

BSI (British Standards Institution)

Body that coordinates and publishes British, European, and international best practice recommendations and **standards**.

byte

In most computer systems, a unit of data that is eight binary digits or **bits** long. Generally used to represent a character such as a letter or number but may also hold a string of bits needed in some larger unit, such as the stream of bits that make up a visual image.

CAD (Computer-Aided Design)
Software used in architecture, archaeology, design, and other fields to create precision drawings, models, and technical illustrations in two or three dimensions. See **born digital**, **vector graphic**.

calibration
The comparison of the specifications of **image-capture**, processing, or display devices to a known **standard** to determine, and perhaps correct, any deviation or error. *See* **color management**.

capture resolution
The number of **samples** per inch (spi) that a **scanner** or **digital camera** is capable of capturing, or the number of samples per inch captured when a particular image is **digitized**.

cataloguing
The process of creating and arranging records that describe materials so as to facilitate identification, search and retrieval, acquisitions, circulation, **preservation**, rights, evaluation, and collocation. A record generally consists of a description; headings for topics, persons, places, etc.; an identification number; and links to related resources, such as **authority** records. Differs from a simple listing by the imposition of **controlled vocabularies** and by mechanisms allowing users to draw relationships between various entities.

CBIR (Content-Based Information Retrieval)
Technology that is able to retrieve images on the basis of machine-recognizable visual criteria. Such **indexing** is able to recognize and retrieve images by criteria such as color, iconic shape, or by the position of elements within the image frame.

CCD (Charge-Coupled Device)
Light-sensitive integrated circuits employed in **image capture** by **scanners** and **digital cameras**. CCDs capture image data as **pixels** with a numerical value that can be converted into an electrical charge, the intensity of which is related to a particular color.

CCITT
The former Comité Consultatif Internationale de Télégraphique et Téléphonique, now the **ITU**, that develops

communications **standards**, including a group of related **lossless compression** schemas for black-and-white images used in fax transmission and supported by the PDF and PostScript language file formats.

CD-ROM (Compact Disk, Read-Only Memory)
A type of write-once, read-many (WORM) disk used to store and distribute large amounts of **digital** data on low-cost, optically recorded media. CD-ROMs profess to have much longer **storage** life ratings than magnetic media such as tape or hard disks, though there have been a few notable instances of failure in less than five years. Gold-reflective-layer CDs are most recommended for long-term storage. A standard CD-ROM stores approximately 650 megabytes of data. *See* **DVD-ROM**.

CDWA (Categories for the Description of Works of Art)
A conceptual framework for describing and accessing information about artworks and surrogates, maintained by the Getty Research Institute. The Visual Resources Association (VRA) Data Standards Committee expanded upon certain portions of the CDWA to formulate the **VRA Core Categories**.

CGI (Common Gateway Interface)
Part of the **Web**'s Hypertext Transfer Protocol (**HTTP**). A platform- independent method of dynamically generating Web pages in response to user input that may be used to gather information from remote **databases**. *See* **ASP**, **JSP**, **PHP**.

channels
The separate color components used by various **color models**. By default, **RGB** images have three channels: red, green, and blue; **CMYK** images have four: cyan, magenta, yellow, and black. Extra or "alpha" channels can be added to describe, for example, levels of transparency, or be used as masks that allow or restrict the output of color. Color creation occurs when the channels are combined before being sent to an output device such as a screen or printer.

checksum
A simple count of the total number of **bits** in a file or transmission unit that may be used to assess data **integrity** or detect error. In **digital preservation** management, checksums can be used to ascertain whether the number of bits in a file has changed over time.

CIDOC (International Committee for Documentation)
A committee of the International Council of Museums (ICOM) involved in developing **documentation standards**, such as the **CIDOC Information Categories** and **CRM**. *See* **AFRICOM**.

CIDOC Information Categories
A **metadata standard** intended to describe museum collection objects developed by the International Committee for Documentation.

CIE (Commission Internationale de l'Eclairage)
Organization that has developed a number of device-independent **color models** collectively called CIE color, including CIE XYZ, CIE LAB, and CIE LUV, that specify color based on human perception and are used as the basis for **color management systems**. *See* **CMS**, **color profile**.

client
See **client/server**.

client/server
Refers to a system architecture that divides functions between two or more computers, or two or more programs, so that one program, the client, makes a service request from another program, the server, which fulfills the request. This architecture is seen in **networks** where a client program in one computer (such as a **Web browser**) forwards a request to a server program in another (possibly distantly located) computer, which returns information to the client.

CMS (Color Management System)
A system designed to ensure the most accurate reproduction of color across multiple input, output, and display devices, and through the life cycle of an image. Each device in a color workflow will have inherent biases that cause it to interpret **digital** color values differently, and no device can properly reproduce the entire range of visible colors. Modern color management systems employ **ICC color profiles** to describe the color reproduction capabilities (and limitations) of individual devices. These are mapped to a device-independent **CIE**-based **color space**, facilitating conversion to matching color output across multiple devices and systems, within the practical limits of the devices. CMS may also refer to Content or Collection Management Systems.

CMYK (Cyan, Magenta, Yellow, Black)
Often referred to as four-color process, CMYK is a subtractive **color model**, using a mix of cyan, magenta, yellow, and black inks to reproduce a range of colors. CMYK is the most basic color process used in print.

codec
A *co*mpression/*dec*ompression (sometimes *co*der/*dec*oder) **algorithm** or scheme that reduces the volume of **bits** necessary to store a data object such as an image file (**compression**) but that allows the reconstruction of the compressed data into a usable format for display, processing, etc. (**decompression**). There are many different codecs, and they are often used to minimize file transfer time in order to optimize images or data for **Web** use.

color chart
A **calibration** target consisting of a matrix or spectrum of colors set to a known **standard**. Color charts can provide reference points to ensure accuracy of color capture and to calibrate output devices. May also be referred to as a color patch. *See* **gray scale**.

color correction
The process of adjusting color values in an image to match the original or a reference image in order to compensate for the normal shifts and biases incurred during digitization and subsequent image processing. *See* **CMS**.

color depth
See **bit depth**.

color management
The practice of **calibrating** all devices in the **image capture**, processing, and output chain to ensure the fidelity of **digital** image files to the objects they represent. Color management can be achieved by manually calibrating devices using **color charts** and **ICC** profiles followed by regular reassessment, or by means of **CMS** software.

color model
An attempt to describe color in a mathematical, predictable, and reproducible way. Usually posits a small core set of colors from which all possible colors can be derived. The **RGB** model assumes that all colors are formed by a given combination of red, green, and blue; the **CMYK** model assumes that all colors are produced by a combination of cyan, magenta, yellow, and black. Both models fall short of describing the whole gamut of visible color. Also known as color system or **color space**. *See* **CIE**, **gray scale**, **HSB/HLS**.

color profile
A file containing data that describes a particular device's **color space** in relationship to an ideal, theoretical, device-independent color space (the **CIE** XYZ color space). Profiles facilitate the conversion of images from one color space to another and form the foundation of color management systems (**CMS**). Most profiles are generated using **ICC standards**.

color space
A three-dimensional geometric representation of the colors that can be discerned and/or created by a particular **color model** (the two expressions may be used interchangeably). May also refer to the range of possible colors that can be produced by a particular output device-such as a monitor, color printer, photographic film, or printing press-or the color description abilities of a particular file format; may also be known as a color gamut. Generally described by a color profile.

compression
The reduction of file size to facilitate transmission or **storage** via any of various **algorithms**. Often required by image files, which are significantly larger than text files. Some algorithms allow the original data to be reconstituted upon decoding or decompression (**lossless compression**), while others discard data permanently (**lossy compression**), which allows a greater reduction in file size. Regardless of the type of compression used, the higher the level of compression, the more noticeable will be the loss in image detail. *See* **codec**.

continuous tone
Refers to images that have an unlimited (or nearly so) range of colors or shades of gray, and which show smooth gradation between shades. **Digital** image reproduction is always confined to limited **palettes**, albeit palettes that may have millions of different colors, while the ability of **bitmapped images** to mimic continuous tone is limited by their **bit depth** and **resolution**. *See* **analog**, **HDRI**, **pixel**.

controlled vocabulary
An established list of terms from which an indexer or cataloguer may select when assigning descriptors or subject headings to a record. *See* **authority**, **cataloguing**, **indexing**, **thesaurus**.

CRM (Conceptual Reference Model)
A **metadata standard**, developed by **CIDOC**, intended to provide a common and extensible semantic framework to which any cultural heritage information can be mapped.

cross-platform
Applications or data that can be used over more than one computer platform or operating system. Facilitated by the adoption of **open standards**.

crosswalk
A chart or table that represents the semantic mapping of fields or data elements in one **metadata standard** to fields or data elements in another standard that has a similar function or meaning. Crosswalks allow semantic **interoperability**. They enable heterogeneous **databases** to be searched simultaneously with a single query as if they were a single database, and facilitate accurate conversion from one metadata standard to another. Also known as field mapping or metadata mapping. *See* **RDF**.

DAM (Digital Asset Management)
A system that enables the management of **digital objects**, such as image files, from ingest to archiving and supports continued retrieval. Off-the-shelf DAM software may offer templates and other devices or strategies to facilitate **ingest**, **metadata** capture, and searching. May also be called media asset management (**MAM**).

database
A structured collection of data. The most common data-structuring model is "relational," where data is organized in related or linked tables that can be accessed or reassembled in many different ways. Object-oriented databases are also common.

data dictionary
An exhaustive list and description of data elements. May be contrasted with a **metadata schema**, which is a selection of data elements and rules for their use geared to a particular purpose.

DCMI (Dublin Core Metadata Initiative)
Body engaged in the development of **interoperable online metadata standards** to support a broad range of purposes. *See* **Dublin Core**.

decompression
See **compression**.

derivative file
A file derived or created from another file, rather than created during an original digitization process. Differs from a copy insofar as the derivative file may be altered in some way from the original.

derivative master
A high-quality "working" image file that is derived from an **archival master** image file, then subjected to some form of processing, such as **color correction**. May also be known as a submaster. Typically used as the source from which smaller, lower-quality **access images** intended for transmission over the **Internet** are derived, while archival masters are kept reserved.

digital
Electronic technology that generates, stores, and transmits data in terms of a limited number of discrete states, most commonly as binary data in which two possible states, positive or nonpositive, are represented by 1 or 0, respectively. Because there are only two possible values, the accuracy of binary digital data at any given point is relatively easy to test, and therefore digital technology facilitates the creation of accurate copies. *See* **digital image**.

digital archaeology
The process of reclaiming digital information that has been damaged or is unusable due to format or media obsolescence. May employ any number of techniques. *See* **digital preservation**.

digital asset
See **digital object**.

digital camera
An **image-capture** device that directly captures **digital** images without the use of film or other **analog** processing. Digital cameras typically employ **CCD** photosensors and output **bitmapped images**. *See **drum scanner**, **flatbed scanner**, **transparency scanner**.

digital certificate
An electronic identifier issued by a certification agency that establishes a user's credentials. Contains the registrant's name, a serial number, certificate expiration information, a copy of the certificate holder's **public key**, and the **digital signature** of the certificate-issuing authority. A recipient can verify that a certificate is real by comparing the public key received with that held in a registry for the certificate holder.

digital image
An image described as a set of **digital** data, such as **pixels** or vectors. Digital images may be **digitized** from **analog** sources such as photographs or may be generated directly within computer applications. If they are not **born digital**, **bitmapped images** consist of pixels whose values are derived from **samples** taken from analog originals, and may use thousands or millions of discrete gradations of color to approximate analog **continuous tone** images. *See **bitmap**, **vector graphic**.

digital object
Data (the content or "essence" of a **digital** file) and the **metadata** describing it, regarded together as a single entity. Also known as a digital asset, an information object, or an information package. May also refer to **born digital** objects.

digital preservation
The specific problems and methods of preserving **digital**, as opposed to **analog**, assets because of their vulnerability to **format** obsolescence and media decay. Various strategies have been developed to respond to this, including **documentation**, the gathering of preservation **metadata**, the use of **open standards**, **redundant storage**, **refreshing**, **migration**, **emulation**, **technology preservation**, **re-creation**, and **digital archaeology**.

digital signature
A form of electronic **authentication** of a **digital** document. Digital signatures are created and verified using **public-key encryption** and serve to tie the document being signed to the signer.

digitizing
The process of deriving **digital objects** from **analog** originals by converting their **sampled** values to binary code. Also known as analog-to-digital conversion and **image capture**.

DIN (Deutsches Institut für Normung)
National **standards** body that represents German interests at European and international levels.

diodes
Light-sensitive electronic components used in **image capture**. They function as one-way valves that sense the presence or absence of light and create a **digital** signal that the computer converts into **pixel** values.

directory (or directory service)
A listing of users and user passwords linked to information about which **network** resources each user may access. Examples include LDAP, Active Directory, and NDS.

DMZ (DeMilitarized Zone)
In the computer **network** context, a computer host or small network that provides an intermediate space between an **extranet** and an **intranet** and so prevents direct access to internal network resources by unauthorized users. Typically secured by two or more **firewalls**.

documentation
Textual information that describes a work of art or image, recording its physical characteristics and placing it in context. May be regarded as one of the most basic **preservation** strategies for **digital** files. *See **cataloguing**, **digital preservation**, **metadata**.

domain name
An address that identifies an **Internet** or other **network** site and acts as a mnemonic alias for an **IP address**. Domain names consist of at least two parts: the top-level domain, which specifies host addresses at a national or broad sectoral level (e.g., ".edu" for the U.S. educational sector); and the subdomain, which is registered to

a specific organization or individual within that domain (e.g., "getty" is registered to the Getty Trust within the .edu domain).

dot pitch
The distance between phosphor "dots," the smallest visual components of an electronic display device. Dot pitch is measured in millimeters (mm) and indicates how sharp a displayed image can be: the smaller the dot pitch, the sharper the image. Users working with images will usually want 0.28mm or finer dot pitch. *See* **monitor resolution**.

DRM (Digital Rights Management)
Server software that may use a number of techniques to control distribution of (usually commercial) content over the **Web**.

drum scanner
A high-quality **image-capture** device that uses **PMT** technology. The original is secured to the drum surface with mounting tape and oil, and the drum then revolves at several hundred revolutions per minute around the scanning mechanism, which in turn moves along the drum, executing a tight spiral scan of its entire surface. **Capture resolution** is determined by the number of **samples** per revolution and the speed at which the scanning sensor moves. Allows higher **resolution**, wider **dynamic range**, and greater **bit depth** than **flatbed scanners**. *See* **digital camera**, **transparency scanner**.

DTD (Document Type Definition)
A formal specification of the structural elements and markup definitions to be used in encoding **SGML**-compliant documents. Examples of DTDs include **EAD** and **HTML**. **XML** is a flexible format that allows for the creation of various DTDs to fit particular purposes. *See* **XSD**.

Dublin Core
A minimal set of **metadata** elements that creators or cataloguers can assign to information resources, regardless of the form of those resources, which can then be used for **network** resource discovery, especially on the **World Wide Web**.

DVD-ROM (Digital Versatile Disk, Read-Only Memory)
A type of write-once, read-many (WORM) disk used to store and distribute large amounts of **digital** data on low-cost, optically recorded media. The DVD-ROM is a newer, and more densely packed, form of **storage** than the **CD-ROM**, and therefore not as well established or, possibly, as reliable for archival purposes. A double-sided, dual layer disk can store up to seventeen gigabytes of data, but the more densely packed the data is, the more vulnerable it is likely to be to degradation. Gold-reflective-layer DVDs are recommended for long-term storage.

dynamic range
The ratio between the brightest and darkest parts of an image, or the potential range of color and luminosity values that can be represented within an image or produced or recognized by a particular output or capture device. *See* **bit depth**, **color space**, **HDRI**, **palette**.

EAD (Encoded Archival Description)
An **SGML DTD** that represents a highly structured way to create "finding aids" for groupings of archival or manuscript materials, making them accessible to researchers by listing the constituent items and their locations.

effective resolution
May be used misleadingly as a substitute term for **interpolated resolution**. Generally refers to "real" **resolution** under given circumstances. Examples include: the possible **capture resolution** of a **digital camera**, as constrained by the area actually exposed by the camera lens; the number of **pixels** per inch of an image, as affected by **resizing** that image; or the **capture resolution** of a scan taken from an intermediary such as a photograph, when mapped to the scale of the original object.

emulation
A **digital preservation** strategy that uses current software to simulate original or obsolete computer environments. May either restore full functionality to archival data or provide a simple viewing mechanism. *See* **digital archaeology**.

encryption
A way of transforming data into "cyphertext" through the use of computer **algorithms** that rearrange the data

bits in **digital** signals in order to prevent them from being read by unauthorized users. May also be used for user and document **authentication**, because only designated users or recipients are given the capability to decrypt or decipher encrypted materials.

extranet
A private **network** that allows an organization to share information, such as parts of their **intranet**, with external users such as vendors or clients over the **Internet**. Extranet systems require security such as **firewall** server management and a means of user **authentication**.

failover
A backup operational mode in which functions are assumed by secondary system components if the primary component becomes unavailable. Used to make **storage** and other systems more fault-tolerant.

film scanner
See **transparency scanner**.

firewall
Software, or software and hardware, that serves as a gateway to block certain types of network traffic, typically used to protect **intranets** from access through **extranets**. Most firewalls work by filtering packets and routing requests based upon **IP addresses**. Others use secure log-on procedures and **authentication** certificates.

flatbed scanner
An **image-capture** device resembling a photocopy machine. The object to be scanned is placed facedown on a glass plate, and a **CCD** array that passes beneath the glass captures an image of the object by **sampling** it at regular intervals. *See* **digital camera**, **drum scanner**, **transparency scanner**.

format
A specification for organizing data. **Digital images** (and their associated **metadata**) may be presented in a number of formats depending on **compression** schemes, intended use, or **interoperability** requirements. Some image formats are broadly decipherable, while others may only be accessible to certain application programs. *See* **GIF**, **JPEG**, **JPEG2000**, **PNG**, **TIFF**.

FTP (File Transfer Protocol)
A method of moving, transferring, or copying files between computers over the **Internet** via **TCP/IP**, rather than simply viewing them over the **World Wide Web** via **HTTP** with the aid of a **Web browser**.

GIF (Graphics Interchange Format)
A widespread **digital image** file **format** introduced by CompuServe, which supports basic animation capabilities and uses **LZW compression**. Can provide only 8-bit color (256 colors) and employs an **adaptive palette** for each image, making GIF undesirable for most **continuous tone** images, such as photographs, though useful for limited-**palette**, monochrome, or **thumbnail** images.

gray scale
The range of shades of gray that **scanners** and monitors can recognize and reproduce, or that is contained within a black-and-white image. May also be used as an alternative term for black and white (a black-and-white image that is digitized has been "grayscaled"). Or, a calibration target showing a standardized continuum of shades between black and white used to determine **image-capture** device specifications. *See* **color chart**.

hacker
A term used to describe a person who endeavors to break into a computer system for some purpose by circumventing security protocols. Sometimes used to describe a particularly talented programmer.

HDRI (High-Dynamic Range Image/Imaging)
An image or image processing device that utilizes a greater **dynamic range** or higher **bit depth** (generally 48-bit or higher) than can be shown on a typical display device, or that can be captured by a single exposure with an ordinary camera. The "extra" **bits** are used to record light and shade (luminance) more accurately.

header
In a computer file, a field or series of fields that precedes the main file content and contains **metadata** describing, for instance, the **compression** or size of an image. Some such fields are automatically filled, but additional metadata may be embedded into the header part of files of certain **formats** for description and management purposes.

HSB/HLS (Hue, Saturation, Brightness/Hue, Lightness, Saturation)
Two variations of a device-independent **color model** that closely matches the way the human eye perceives color. Often used in desktop graphics programs.

HTML (HyperText Markup Language)
An **SGML**-based markup language used to create documents for **World Wide Web** applications. Predominately concerned with specifying the design and appearance of content, rather than the representation of document structure and data elements. *See* **XML**.

ICC (International Color Consortium)
Body promoting the standardization of open, vendor-neutral, **cross-platform** color management system (**CMS**) architecture and components. Developer of the ICC **color profile** specification.

ICONCLASS
A system of letters and numbers used to classify the iconography of works of art, developed in the Netherlands.

IEC (International Electrotechnical Commission)
Organization that prepares and publishes international **standards** that may serve as a basis for national standardization for all electrical, electronic, and related technologies.

IEEE (Institute of Electrical and Electronics Engineers)
Body that promotes development and **standards** in the electronic and information technologies and sciences.

image capture
See **digitizing**.

image resolution
The number of **pixels**, in both height and width, making up an image. Generally, the higher the number of pixels, the greater the image's clarity and definition. *See* **resolution**.

index
See **indexing**.

indexing
The process of making a list of terms and other data stored in a structured data file and used to enhance access and discovery. Indexing terms represent the most salient information necessary to retrieve a record or object; they are often taken from a **controlled vocabulary**. See **authority**, **cataloguing**, **thesaurus**.

ingest
The process of entering new assets into a management system. The contributor transmits an asset and its **metadata**, either bundled together as a single **digital object** or separately, to allow accurate retrieval and eventual reuse of the asset.

integration
Combining systems, applications, or sets of data so that they work together. In "seamless" integration, the distinctions or boundaries between systems are imperceptible to users.

integrity
A **digital** entity has integrity when it is whole and sound or when it is complete and uncorrupted in all its essential respects. *See* **authenticity**.

interface
Allows users to communicate with, or use, applications by entering or requesting data. Most are now graphical user interfaces (GUIs), in which functions are displayed graphically and can be activated using a cursor or similar pointing device rather than using older text-, keyboard-, or menu-driven controls. Hardware interfaces allow pieces of equipment to communicate or work together.

Internet
A global collection of computer **networks** that exchange information by the **TCP/IP** suite of networking protocols.

interoperability
The ability of different computer-based systems or applications to work together correctly, particularly in the correct interpretation of data semantics, or their ability to understand and, where appropriate, utilize each

other's data. Applications and systems that adhere to known **standards** promote interoperability and remove reliance on a small group of suppliers.

interpolated resolution
The **resolution** at which a device is capable of capturing or generating an image using **interpolation** (i.e., using data that has no authentic relation to an original). *See* **optical resolution**.

interpolation
An estimation of a value within two known values. A means by which a device can exceed its **optical resolution** capacity by inserting new **pixels** in between those derived by **sampling** the original. Can improve apparent picture quality; however, interpolated images tend to look blurred when they are enlarged and use data that is inauthentic or not derived from the original.

intranet
A private **network** that is accessed via **TCP/IP** and other **Internet** protocols but uses a gateway to limit access, typically to local users recognized by **IP address**, domain, or by some other means of **authentication**.

IP (Intellectual Property)
Any intangible asset that is a product of human knowledge and ideas. Examples include patents, copyrights, trademarks, and software. IP may also denote "Internet Protocol."

IP (Internet Protocol)
The method by which data packages are delivered from computer to computer over the **Internet**. Once delivered, the Transmission Control Protocol (**TCP**) puts them into the correct order. IP may also denote "intellectual property."

IP address
Part of the Internet Protocol (**IP**). A hierarchical, numeric addressing system that can be used to identify each device sending or receiving information on a **network** with a 32-bit number.

ISO (International Organization for Standardization)
Body that promotes standardization. Many national **standards**-making bodies, such as **ANSI**, participate in, and contribute to, ISO standards making. The Joint Photographers Experts Group (**JPEG**) and the Motion Picture Experts Group (**MPEG**) are both bodies within the ISO.

ITU (International Telecommunications Union)
Organization with the United Nations System that coordinates telecom **networks** and services. The ITU-T division produces **standards** or recommendations for all areas of telecommunication.

JFIF (JPEG File Interchange Format)
A public domain iteration of the **JPEG** image-**compression** format.

JPEG (Joint Photographers Experts Group)
A body within the **ISO**. Also a widely adopted image **compression standard** developed by that body, which uses a **lossy-compression algorithm** able to significantly reduce image file size while maintaining reasonable image quality. Typically capable of compression ratios from 10:1 to 20:1.

JPEG2000
A file **format** that uses **wavelet compression** to allow both **lossy** and **lossless compression** and can provide scalable images from a single compressed file. Commercial implementations are becoming available, and **open-source** implementations are in development. A separate standard to **JPEG**, and generally able to provide reasonable image quality at higher compression ratios (some sources cite ratios of 2:1 with lossless compression and up to 200:1 with lossy compression).

JSP (Java Server PagesT)
One of several methods of dynamically generating **Web** pages in response to user input that may be used to gather information from remote **databases**. Platform-independent technology developed by Sun Microsystems that utilizes small programs called "servlets." *See* **ASP**, **CGI**, **PHP**.

LAN (Local Area Network)
A limited **network**, typically within a building or department and owned and operated by the user. May be connected to other networks, such as the **Internet**, via network points known as gateways. An ethernet is a

high-**bandwidth** LAN specification used to network computers and other devices together in a cabled or wireless environment.

LCSH (Library of Congress Subject Headings)
A **controlled vocabulary** of terms commonly used to retrieve library materials.

lossless compression
Reduction in file size without loss of information, achieved by storing data more efficiently. A **bitmapped image** that has undergone lossless compression will be identical to the original uncompressed image when decompressed. The **GIF**, **TIFF**, **PNG**, and **JPEG2000** image formats allow lossless compression, which cannot shrink file size to the extent possible with **lossy compression**.

lossy compression
Reduction in file size that involves permanent loss of information. **Algorithms** selectively discard data in order to attain a greater size diminishment than is possible with **lossless compression**. Entails a decrease in quality, but this is often imperceptible (or nearly so) with image files, depending on the level and type of compression employed. The **JPEG** and **JPEG2000 formats** allow lossy compression.

LZW (Lempel-Ziv-Welch)
A **proprietary lossless-compression algorithm**.

machine-readable
Data presented in an electromagnetic form that a computer can access, such as data stored on disk or tape, and organized in such a way that given the correct program, a computer can process or execute instructions contained in the data, such as rendering an image.

MAM (Media Asset Management)
A system for handling media assets through processes such as **cataloguing**, controlling access, managing circulation, tracking rights and publication history, and ensuring **preservation**, or software designed to perform all or some of these tasks. May also be called digital asset management (**DAM**).

MAN (Metropolitan Area Network)
A **network** that connects users over a region larger than a **LAN** but smaller than a **WAN**. Can be used to denote the interconnection of several LANs but most often applies to the interconnection of networks in a city into a single, larger network.

MARC (MAchine-Readable Cataloguing)
A set of standardized **metadata** structures that facilitates cooperative **cataloguing** and data exchange in information systems. Developed to describe bibliographic materials but extended to describe nonbibliographic holdings.

master file (or master image)
A high-quality, uncompressed **digital** file, or the highest quality file available, from which other files, most commonly smaller, **compressed** files for **online** access, can be derived. Master images will have the greatest level of detail and color fidelity available. *See* **archival master**, **derivative master**.

metadata
Commonly defined as "structured data about data," or data captured in specific categories or elements. Metadata can include data associated with either an information system or a data object or set of objects for purposes of description, administration, **preservation**, the documentation of legal requirements, technical functionality, use and usage, and so forth. *See* **cataloguing**, **digital object**.

metadata schema
A set of rules for recording or encoding information that supports a specific **metadata** element set.

meta tag
An **HTML** tag that enables descriptive **metadata** to be embedded invisibly on **Web** pages, used by some **search engines** to establish relevance to search requests.

METS (Metadata Encoding and Transmission Standard)
A flexible **XML** format for **digital** library objects that provides a "**wrapper**" to hold together the various types of **metadata** that may be used to describe an asset or group of assets. Data and metadata may be embedded within a METS document, or the document may point to external resources. The format's generalized framework

offers a syntax for the transfer of **digital objects** between repositories that may be used within the **OAIS** model.

middleware
A computer program that mediates between two existing, separate computer programs.

migration
Digital preservation strategy that involves transferring data from a format or standard that is in danger of becoming obsolete to a current **format** or **standard**. The most common example is the process of upgrading files to become compatible with a new version of software or operating system. May also be known as conversion or reformatting.

MIX (Metadata for Images in XML)
XML metadata schema developed by **NISO** and the Library of Congress, based on the *NISO Data Dictionary: Technical Metadata for Digital Still Images.*

MODS (Metadata Object Description Schema)
XML metadata schema developed by the Library of Congress and the **MARC** Standards Office designed to both transmit selected data from existing MARC 21 records and enable the creation of original resource description records.

monitor resolution
May be used interchangeably with **screen resolution** or may indicate the maximum possible resolution of a computer monitor. Higher monitor resolution indicates that a monitor is capable of displaying finer and sharper detail, or smaller **pixels**. Monitor detail capacity can also be indicated by **dot pitch**.

MPEG (Motion Picture Experts Group)
A body within the **ISO** that has produced **standards** for the **compression**, **storage**, and **documentation** of multimedia and motion pictures, such as the **MPEG-7 standard** or the MPEG-21 Multimedia Framework.

MPEG-7 (Multimedia Content Description Interface)
A **metadata standard** that provides a set of standardized tools to describe multimedia content. Both human users and automatic systems that process audiovisual information are within its scope.

NAF (Name Authority File)
Authority file maintained by the Library of Congress that contains headings for names, uniform titles, and series.

NAS (Network-Attached Storage)
A system where a data **storage** device is attached to a **LAN** and assigned its own **IP address**, rather than being attached to the **server** offering data processing and management functionality, thus releasing the server from data delivery duties. May be incorporated into a **SAN** system. Affordable consumer NAS systems are entering the market as of this writing.

native-XML
Used to describe applications that are able to process **XML** data without transforming it to another **format**. For instance, native-XML **databases** allow XML documents to be stored, indexed, and retrieved in their original format, preserving their content, tags, attributes, entity references, and ordering. *See* **XML-enabled**.

nearline
Storage and retrieval system where assets are stored **offline**, such as on removable disks (hard drives, **CD**- or **DVD-ROM**s), but are available in a relatively short time frame if requested for **online** use or use over a **network**.

network
An arrangement of devices such as **servers**, computers, and printers joined by transmission paths by which programs make requests of one another. Local area networks (**LAN**), metropolitan area networks (**MAN**), wide area networks (**WAN**), and the **Internet** are all examples of networks.

network topology
A particular configuration used to connect devices on a **network**.

NISO (National Information Standards Organization)
Body that identifies, develops, maintains, and publishes technical **standards** to manage information in both traditional and new technologies.

noise
Unwanted data or imperfections in a file that are somehow developed in the course of scanning, processing, or data transfer.

OAI (Open Archives Initiative)
Body that develops and promotes **interoperability standards** that aim to facilitate the efficient dissemination of content, such as its **XML/Dublin Core**-based Protocol for Metadata Harvesting, which provides a mechanism for "harvesting" or gathering XML-formatted **metadata** from diverse repositories.

OAIS (Open Archival Information System)
The Reference Model for an Open Archival Information System provides a common conceptual framework for creating archival systems designed to aid the long-term **preservation** of, and access to, **digital** information. Often cited in concert with **METS**; a METS document could serve as a Submission Information Package (SIP), an Archival Information Package (AIP), or a Dissemination Information Package (DIP) within the OAIS model.

Object ID
Metadata schema that sets out the minimum information needed to protect or recover an object from theft and illicit traffic. Its purpose is to uniquely identify an object in order to establish ownership.

offline
Storage and retrieval system where assets are not immediately available for use, or not accessible through a **network** or computer, but stored on some independent media, such as a **CD-ROM**.

online
Storage and retrieval system where assets are immediately available for use or directly connected to a **network** or computer through fixed disk storage.

OPAC (Online Public Access Catalog)
Automated, computerized library catalogs made available to a wide range of users.

open architecture
A system design and framework that is well defined and uses **open standards** so that functionality can be added by third parties. This allows the original technology to benefit from industry-wide developments and allows users more flexibility in extending an application or building **interoperability** with other systems.

open source
A product or system whose workings or source code are exposed to the public and therefore to modification by anyone. Open source software is generally developed as a public collaboration and made freely available for use or modification as developers see fit, as opposed to **proprietary** products or systems. Open systems built to known **standards** promote **interoperability**.

open standards
Freely available structures, procedures, or tools for the uniform creation and description of data. Usually defined and perhaps maintained by a central body, but, unlike **proprietary standards**, users are not reliant on a private organization to license use and provide support.

optical resolution
The **resolution** at which a capture device, such as a **scanner** or **digital camera**, is capable of capturing **pixel** values based on actual **samples** taken from an original to construct an image. Optical resolution is the true measure of the capture capacity or quality of a scanner, as opposed to **interpolated resolution**.

output resolution
The **resolution** of an image based upon the dimensions, in **pixels** or units of length, as affected by the chosen output method, such as display on a monitor or printing on a page.

palette
The set of colors that appears in a particular **digital image**, or the set of available colors based on the **color space** being used by a particular output device.

password
A character sequence providing means of **authentication** for a user requesting access to a computer or application. A password is typically entered along with a user name or identifier that, when paired with the password, serves to uniquely identify a user and associate the user with a particular profile, or set of access privileges and rights.

peer-to-peer (P2P)
As distinct from **client/server** relationship, a peer-to-peer **network** connects computers or programs so that no party is dedicated to serve the other, and any is able to initiate a transaction.

PHP (Hypertext Preprocessor)
One of several methods of dynamically generating **Web** pages in response to user input that may be used to gather information from remote **databases**. Utilizes **open source** script language. *See* **ASP**, **CGI**, **JSP**.

pixel
From *pi*cture *el*ement. The smallest programmed unit of a **bitmapped image**, similar to grain in a photograph or a dot in a halftone print. Pixel size, frequency, and color determine the accuracy with which photographic images can be represented. The greater a pixel's **bit depth**, the greater the number of different shades or colors it can represent. The larger or fewer the pixels within an image, the more likely "pixelation"-where individual pixels become apparent and break the illusion of **continuous tone**-is to occur. *See* **resolution**, **sample**.

plug-in
An easily installed, usually downloadable program used by a **Web browser** to enable the use of certain media or the execution of specialized **Web** functionality. A media player, where audio or video encoding requires a particular player to decode and run media files, is an example of a plug-in.

PMT (PhotoMultiplier Tube)
An amplifying vacuum tube used in **drum scanners**. PMT technology is highly sensitive to differences in light intensity. It takes in light reflected from reflective originals or through transparent originals, converts it to an electrical signal, and amplifies the signal to measurable levels that can then be assigned **digital** color values.

PNG (Portable Network Graphics)
A patent-free file **format** for **lossless compression** of images that provides some additional features that improve the ability to control image appearance over the **GIF** format.

preservation
See **digital preservation**.

printer resolution
The maximum density of dots per inch that a printing device is capable of producing, or the density of dots per inch used in a particular printing.

proprietary
A technology or product that is owned exclusively by a single commercial entity that keeps knowledge of its inner workings secret. Some proprietary products can only function when used with other products of the same ownership. The limitations of proprietary technology are fueling moves toward **open standards**.

public-key encryption
A security measure used in **digital signatures** wherein a value provided by a designated authority is combined with a private key value and used to **encrypt** transmitted data.

quality control
Techniques ensuring that accuracy and high quality are 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 orientation.

RAID (Redundant Array of Independent Disks)
Storage device comprised of systems of multiple hard disks holding the same information. Intended to increase performance and reliability in serving and storing data. There are various RAID configurations, each suited to different needs relating to demand or traffic, user needs such as read-only or read/write, and fault-tolerance requirements.

raster image
See **bitmap**.

RDF (Resource Description Framework)
A foundation for processing **metadata** that complements **XML** and includes a standard syntax for describing and querying data. Yet to be generally adopted as of this writing. A component of the proposed **Semantic Web**. *See* **crosswalk**.

re-creation
A **digital preservation** concept postulating that if the delivery and content of **born digital** work such as multimedia or installation art could be adequately documented in a way that was independent of its native medium or platform, it would be possible to re-create it using a future medium or platform.

redundant storage
A **digital preservation** strategy whereby two or more copies of **digital** content are made on the same or different media and stored in different locations under archival environmental conditions. For example, one set of media may be stored offsite, or two institutions may agree to store one another's redundant copies.

refreshing
A **digital preservation** strategy that protects against the possible degradation of **digital** content due to **storage** media decay by copying digital information held on a particular storage medium to a new medium, of the same or different type, while keeping the digital information itself in the same **format**.

refresh rate
The number of times that a screen display is refreshed or repainted per second, expressed in hertz. The refresh rate for each display depends on the system **video card**. Rates of below 70 Hz can cause image flickering and eyestrain, and, as such, rates of 75 Hz to 85 Hz are recommended.

resampling
May be used interchangeably with **resizing**. Alternatively, refers to changing the number and values of **pixels** in an image, technically by creating a new, empty **bitmap** of the desired dimensions and using the original image pixels as the basis from which to work out the values for each new pixel using various **algorithms**. Resampling generally involves **interpolation** and should be used cautiously. *See* **compression**.

resizing
May be used interchangeably with **resampling**. Alternatively, it refers to changing the physical dimensions of an image file without changing its pixel dimensions (for example, by changing the parameters for default print size). This would result in the **output resolution** of an image being set to a particular value but in no information (no pixels) being gained or lost.

resolution
A relative, rather than an absolute, value, usually expressed as the density of elements, such as **pixels**, within a specific distance, most commonly an inch. *See* **capture resolution**, **effective resolution**, **image resolution**, **interpolated resolution**, **monitor resolution**, **optical resolution**, **output resolution**, **printer resolution**, **screen resolution**.

resource sharing
The ability to federate collections of **digital** assets, or simply the **metadata** describing those assets, into larger resources where the costs of management are shared. Or, the ability to use assets and/or metadata outside the system or institution in which they originated. Examples include the OCLC (Online Computer Library Center, Inc.) Digital Archive; AMICO (the Art Museum Image Consortium), where contributors transmit catalog records, digital files, and metadata records for museum objects to a central repository; RLG (Research Libraries Group) Cultural Materials; and ARTstor.

RGB (Red, Green, Blue)
An additive **color model** or system for representing the color spectrum using combinations of red, green, and blue. Used in video display devices, and is the standard color system for most **digital** imaging devices and applications.

rights management
The description and identification of intellectual property (**IP**) and the rights and restrictions relating to it, including the conditions of use. May become very complicated where dealing with originals and various **digital** surrogates, where each instance of a work may have different restrictions placed upon it.

RLG Preservation Metadata Elements
A **metadata** element set intended to capture the minimum information needed to manage and maintain **digital** files over the long term. It captures technical rather than descriptive information and may be combined with any descriptive element set to describe an image file.

sample
A **digital** value derived from measuring a discrete part of an **analog** original. *See* **sampling**.

sample depth
See **bit depth**, **dynamic range**.

sampling
The mechanism by which **analog** signals or objects are **digitized**. Sampling involves dividing an analog whole into regularly spaced, smaller discrete components, measuring the values of each such component, and converting these measurements to binary code. Provided enough **samples** are taken, the readings create the illusion of a continuous (i.e., **analog**) signal or object when decoded.

SAN (Storage Area Network)
A sophisticated **online storage** system where a high-speed special-purpose subnetwork of shared storage devices is accessible from any **server** in the **LAN** or **WAN network** of which the SAN is a part. In this system, data is readily accessible, but because it is stored separately from the server, server power and network capacity are released for other purposes. *See* **NAS**.

scalable
A scalable system is one whose size can be adjusted to meet ongoing requirements or where each part of a system is flexible enough to accommodate growth or reduction in another part. **Open-source** systems are more likely to be scalable over time, as they allow a greater number of alternative responses to change.

scanner
A device that captures images from **analog** sources for computer editing and display. **See** *digital camera*, *drum scanner*, *flatbed scanner*, *transparency scanner*.

screen resolution
Sometimes used interchangeably with **monitor resolution**. Otherwise refers to the number of **pixels** shown on a computer monitor screen. Screen or display resolution is variable and may be set to a number of default settings, such as 800 x 600 or 1024 x 768.

search engine
A set of programs accessed through the use of a **Web browser** that executes searches on the **Internet**. There are various search engines, but most include a program that goes out and reads searchable **Web** site pages, a program that creates an **index** or catalog of searched pages, and a program that receives the search request and returns results, usually in the form of a ranked list chosen from the index. May be confined to searching a particular site or set of sites.

Semantic Web
An idea or proposal to enhance the "intelligence" of the **Web** set forth by its inventor, Tim Berners-Lee. Web content authors would describe, catalogue, or **index** sites to improve the ability of future **search engines** to recognize context and therefore return more relevant results to Web users. *See* **RDF**, **XML**.

server
A computer program that provides services to other computer programs by responding to requests and supplying or accepting data. *See* **client/server**, **storage**.

SGML (Standard Generalized Markup Language)
ISO standard ISO/IEC 8879:1986, first used by the publishing industry, for defining, specifying, and creating **digital** documents that can be delivered, displayed, linked, and manipulated in a system-independent manner. *See* **DTD**, **HTML**, **XML**.

SPECTRUM
A broad range of data elements associated with transactions for museum objects developed by the UK-based mda.

SPIFF (Still Picture Interchange File Format)
A **format** intended to replace the ubiquitous, as of this writing, **JFIF** as the format for images using the **JPEG compression algorithm**. It offers additional **color spaces** as well as expanded functionality.

sRGB
A single, default **RGB** color space for display devices, codeveloped by Microsoft and Hewlett-Packard, intended to standardize the many different RGB "flavors." May be used in conjunction with **ICC color profiling**.

standards
Formal structures, procedures, and tools designed to promote uniformity and predictability. Typically developed, adopted, and promoted by large organizations that can advocate for their broad usage. Data standards enable the exchange of data, while technology standards enable the delivery of data between systems.

storage
The physical holding of **machine-readable** data. Data may be stored on a variety of media, including hard disk, magnetic tape, and optical media such as **CD-ROM**. All data and media should be stored under archival environmental conditions (for instance, with temperature, lighting, and humidity controls) as a basic **digital preservation** strategy. *See* **NAS**, **nearline**, **offline**, **online**, **redundant storage**, **SAN**, **storage networking**.

storage networking
Various methods of storing data **online** while optimizing **network** performance. Generally involves the separation of data **storage** from **server** processing, allowing data to be directly transferred between storage devices and **client** machines and avoiding server bottlenecks. An Open Storage Network (OSN) is a storage networking system that emphasizes the use of **standards** to promote flexibility, **interoperability**, and **scalability**. Storage networking vendors have cooperated to form the Open Storage Networking Initiative (OSNI), and the term is often used in marketing. *See* **NAS**, **SAN**.

submaster
See **derivative master**.

subpixel
Each red, green, and blue element in a **pixel** is referred to as a subpixel. Each carries a particular color **channel**.

TCP (Transmission Control Protocol)
The transport layer in the **TCP/IP standard** that provides reliable data delivery over the **Internet**. It divides files into numbered packets for sending and reassembles them in the correct order on delivery. It also detects corrupt or lost packets and resends them.

TCP/IP (Transmission Control Protocol/Internet Protocol)
The **ISO** standardized suite of **network** protocols that enables information systems to link to each other over the **Internet**, regardless of their computer platform. **TCP** and **IP** are software communication **standards** used to allow multiple computers to talk to each other in an error-free fashion.

technology preservation
A **digital preservation** strategy that involves preserving the complete technical environment, such as software, drivers, operating systems, fonts, passwords, and settings, necessary to facilitate access to archived data as well as its functionality, appearance, and behavior. An alternative approach is **emulation**.

TGM-I and TGM-II (Thesaurus for Graphic Materials I and II)
A body of terms maintained by the Library of Congress and used in subject **indexing** for pictorial materials such as prints, photographs, drawings, posters, architectural drawings, cartoons, and pictorial ephemera.

TGN (Getty Thesaurus of Geographic Names)
A **controlled vocabulary** maintained by the Getty Research Institute that lists and organizes alternative names for geographic locations.

thesaurus
A structured vocabulary of terms, typically including synonyms and/or hierarchical relationships, used to organize collections to allow cross-referencing for purposes of reference or retrieval. *See* **authority**, **controlled vocabulary**, **cataloguing**, **indexing**.

thumbnail
A proxy image, generally scaled to a much smaller size, used to represent a parent image in circumstances where loading the original is undesirable. Often used on the **Web** to display tables of smaller images with links to a larger view, preserving **bandwidth** and enabling the display of more images in the same area for the purposes of browsing.

TIFF (Tagged Image File Format)
A common image file **format**, TIFF is widely used as a format for storing uncompressed, or **losslessly compressed**, **digital image** data, though it also supports several **compression algorithms**. TIFF has gained wide acceptance for uses such as high-resolution scanning, image archiving, and editing applications.

transparency scanner
A **scanner** specifically designed to capture images from film or transparent media. *See* **drum scanner**, **digital camera**, **flatbed scanner**.

true-color image
Alternative term for 24-bit images.

ULAN (Union List of Artist Names)
A **controlled vocabulary** maintained by the Getty Research Institute that lists and organizes alternative names for artists.

vector graphic
An image composed of mathematically described elements, such as lines, arcs, and points (vectors), plotted in two- or three-dimensional space. The use of mathematical formulas to describe an image, instead of **pixels**, means vector graphics are not constrained by **resolution**, allowing them to be output at any size without loss of detail or other artifacts of pixel-based processing. Vector-based imaging is inappropriate for **continuous tone** imaging. *See* **bitmap**.

video card
The circuit board that enables a computer to display information on its screen. Determines the **resolution**, number of colors (**bit depth**), and **refresh rate** of display, in combination with the inherent limitations of the monitor used. Also known as a graphics adapter, display adapter, or video adapter.

VPN (Virtual Private Network)
A private data **network** that an organization can use to offer access to remote users or individuals, which makes use of public telecommunication infrastructure, such as the **Internet**, maintaining privacy through the use of a tunneling protocol and security procedures. Data is encrypted as it is sent and decrypted as it is received, so the virtual "tunnel" can only be traversed by properly encrypted data.

VRA Core Categories
A **metadata schema** specifically designed to describe not only original works but also their visual surrogates, including **digital images**, in considerable detail.

W3C (World Wide Web Consortium)
International consortium that develops vendor-neutral **open standards** and specifications for **Internet** and **Web**-based transactions, with the intent of promoting **interoperability**.

WAN (Wide Area Network)
A **network** that operates over a geographically dispersed area and is therefore typically slower than a **LAN**. WANs often link LANs together using a high-speed, long-distance connection.

watermark
A unique identifier added to a content file, such as an image, which can be visible or invisible to viewers. The mark, which could be a statement, symbol, or hidden encoding, is designed to persist through processing and serve as evidence of ownership in order to deter piracy.

wavelet compression
Compression technology, which may be lossy or lossless, that analyzes an image as a whole rather than dividing it into pixel blocks, as the **JPEG** compression **algorithm** does. This allows greater compression while still maintaining acceptable image quality. Wavelet technology can achieve compression ratios for color images of 20:1 to 300:1, and of 10:1 to 50:1 for **gray scale** images. *See* **JPEG2000**.

Web
See **World Wide Web**.

Web browser
A **client** program installed on a user's computer that makes requests of a **World Wide Web server** using the Hypertext Transfer Protocol (**HTTP**). The most common Web browser programs currently in use are Netscape Navigator and Microsoft Internet Explorer.

Wintel
Personal computers that run one of the Windows operating systems produced by Microsoft and an Intel microprocessor, such as the Pentium Pro. Also known as PCs. Generally contrasted with systems that use another operating system, especially Apple personal computers that use a Macintosh operating system and Motorola or PowerPC microprocessors.

World Wide Web
A vast, distributed **client/server** architecture for retrieving hypermedia or hypertext (interactive documents and media joined together by "links" or selectable connections) over the **Internet** using the Hypertext Transfer Protocol (**HTTP**).

wrapper
A file used to encapsulate another file or collection of files. For example, the **METS** system either "contains" a **digital** file and its metadata in an **XML** file that describes them or points to files stored elsewhere.

XHTML (eXtensible HyperText Markup Language)
A reformulation of **HTML** as an application of **XML** designed to express **Web** pages. Users can extend XHTML to include new elements and attributes, and XHTML documents can be read and validated with standard XML tools.

XML (eXtensible Markup Language)
A simplified subset of **SGML** designed for use with the **World Wide Web** that provides for more sophisticated, meaningful (semantic), and flexible data structuring and validation than **HTML**. XML is widely forecast to be the successor to HTML as the language of the **Web** and is an essential component of the proposed **Semantic Web**. *See* **XHTML**, **XSD**, **XSL**, XSLT.

XML-enabled
Designed to be compatible with **XML**. For instance, XML-enabled **databases** use **middleware** to translate between **XML** documents and traditional relational or object-relational **databases**. *See* **native-XML**.

XSD (XML Schema Definition)
A specification designed to express relational or non-narrative data in **XML**. Provides a standard way to validate data sets and to exchange them between applications. *See* **database**, **DTD**.

XSL (eXtensible Stylesheet Language)
The language used to create style sheets that describe how **XML**-structured data is to be displayed to **Web** users.

XSLT (eXtensible Stylesheet Language Transformations)
May be regarded as an extension of **XSL**. Provides a standard way to reorganize the data represented in one **XML** document into a new XML document with a different structure, or into another format altogether.

Z39.50
ISO 23950 and **ANSI/NISO** Z39.50 standard information retrieval protocol, a **client/server**-based method of searching and retrieving information from heterogeneous (usually remote) **databases**, most often used in bibliographic implementations. The ZNG (Z39.50 Next Generation) Initiative aims to update Z39.50 and make it compatible with **XML** and other current **Web** technologies.

The following sources were referred to in creating this glossary: Andy Moore's *The Imaging Glossary, Electronic Document and Image Processing Terms, Acronyms and Concepts* (1991); *The Electronic Imaging Glossary* (1994), compiled by Mimi King for the Library and Information Technology Association of the American Library Association; Internet.com's Webopedia; the FOLDOC Free On-Line Dictionary of Computing; and TechTarget's IT-specific encyclopedia Whatis?com. Maria Bonn, Nigel Kerr, and Jim Schlemmer contributed to the development of further definitions used in the first edition.