
The Beginner's Guide to Digital Imaging - Glossary

This glossary is meant to give the reader an introduction to digital imaging at the 'street level', and is presented from the perspective of a user learning from the ground up. Many of the terms have extended and more technical definitions and applicability; the reader is encouraged to go further by self-education. This knowledge level is recommended for anyone embarking on a digital imaging project, or making decisions about the care of a digital image repository

- Image (i.e., digital image) – a digital or binary file (in ones and zeros) representing the 3 dimensional physical subject or object of the camera.
- Image compression – the act of converting a higher resolution image (image file size, number of pixels) to make the file size smaller by reducing binary information in a number of dimensions, bit depth or resolution, and the result may be lossless or lossy.
 - Compress – the action of making an image file size smaller, often at the expense of quality (to achieve a smaller file size), e.g., by saving a TIF file to JPG, or by saving a 24 bit TIF to an 8 bit TIF.
 - Uncompressed – an image that has not been compressed.
 - Compression formats:
 - DNG (.dng) (Digital Negative) – a publically available digital file format suitable for archiving. It is part of the logical step to convert from a camera raw format directly to DNG and not lose any information (plus it is lossless).
 - JPEG (.jpg) (Joint Photographic Experts Group) – a lossy image compression format that is fit for display. It will eventually be replaced by the lossless JPEG2000. This format can only use the 8-bit color range.
 - JPEG2000 (.jp2, .j2k)(JPG2000, JPG 2K) – an image digital compression format whose benefit is that it is essentially lossless, and does not suffer from the same degradation when edited.
 - PNG (.png) (Portable Network Graphics) –a lossless image compression format fit for display. It replaced the proprietary GIF format and is 10-30% more compressed (smaller file size) than GIF.
 - Raw (Camera raw : e.g., NEF, CR2, PEF) – a proprietary digital image file format straight out of the imaging device, i.e., the camera, whose image size and quality is determined by the camera settings and the size of the its image sensor.
 - TIFF (.tif) (Tagged Image File Format) - A proprietary lossless image compression format not fit for display. It needs special

software support (e.g., Photoshop) to be displayed. It has been the archival file format of choice for over a decade. This format can only use the 16-bit color range.

- Compression resolutions
 - Native resolution – the unaltered resolution as it comes out of the camera, determined by the camera settings of the image format, and the sensor size, usually something like 24 bit camera raw.
 - Lossy – the compression of a digital image with software where the image is made smaller, and at the same time stripped of some amount of high quality visual information (data are lost). It can introduce unwanted artifacts in the image – halos, noise. E.g., the conversion of TIF -> JPG is lossy. It should not be used as when the image is going to undergo lot of post-processing editing, as the image degrades with each save.
 - Lossless - the compression of a digital image with software where the image is made smaller, but it does not lose any visual information. E.g., the conversion of TIF -> JPEG 2000 is lossless, likewise, the conversion of camera raw -> DNG is lossless. Lossless compression is preferred for archival purposes – for optimal economy – nothing is lost visually in the image, it can be safely edited, and the file size is smaller.
- Image bit depth (e.g., 8-bit, 16-bit, 24-bit) – it is the measure of the density of bits in an image. A 24-bit image will be able to have the full complement of colors, the 'True Color' standard, whereas an 8-bit image has a reduced number of colors it can represent. The human eye cannot see in a higher range, but saving at more than 24-bits can hold up better when edited.
- Image resolution – usually measured in bits, either by ppi (pixels per inch) or a row * column measurement, e.g., 1500 * 2400). The more bits in an image the better it looks when zoomed in or when enlarged.
- Image metadata : examples of metadata standards embedded in a modern digital camera image: EXIF, IPTC, XMP.
 - EXIF (Exchangeable Image File Format) – a standard image metadata (tagging) schema, contained in an image file (e.g., TIFF or JPEG, and put there when the image is saved from camera raw. It can be edited in the post-processing phase of the workflow by special purpose editors. The metadata can be extended by custom fields determined by the user, e.g., adding record data about the subject of the image, not just the information about the camera and settings, geo-location and date the image was taken. It is not supported in JPG2000, PNG or GIF file formats.

- IPTC (International Press Telecommunications Council) – similar to EXIF for encoding basic image source information. Originally developed for the interchange of press images, it became a standard metadata schema for embedding information in image files. In recent years, it has evolved into XMP (Extensible Metadata Platform) to be a more extensible schema.
- Digital image workflow – the formal term for the steps in creating a finished digital image, comprising any of the following steps: taking the image, editing and saving it, and then archiving it.
- Image processing – the act of taking a native or raw image and changing it via any of the possible post-processing steps, by compressing it to either a lossy or lossless in the same or other image format, or altering the resolution.
- Image post-processing – a bit of a misnomer – really means the processing or adjustment steps to a digital image once it has been taken, and usually after it has been downloaded from the camera to the computer.
 - Compositing – the step in the digital workflow that entails editing multiple images together to form another image for the purposes of combining multiple related, adjacent images, or for altering the image in such a way that is not faithful to ‘reality’.
 - Sharpening (edge enhancement) – a post-processing step in the workflow that makes the image seem more crisp, can help with a small amount of out-of-focus-ness. This technique is especially helpful when enlarging an image. E.g., ‘un-sharp mask’ software tool is often applied to the image to good effect.
 - Enhanced color saturation - another post-processing step in the workflow where the colors are ‘improved’ to make a more pleasing appearance but may result in an image that is not true to ‘reality’.
 - Image contrast - another post-processing step in the workflow where the visual difference between black and white is increased, often by reducing the shadows (grey).
 - White balance – the pre-imaging step of assuring the correct color balance in the camera before taking the image or the post-processing step of eliminating unwanted colour casts (e.g., blue, yellow, green) produced by ambient lighting conditions, or faulty setting in the camera. A colour checker in the image is one device to assure visually that the balance is correct, or a test shot with a grey card is another way.
- Image archiving – the formal practice of planning for the long-term storage of valuable digital artifacts in their highest resolution practically possible – ‘write once, read never’. Fraught with concerns for digital formats of the unknown future, and the need to fund the ever-growing vast amounts of storage required. For the periods in the 2010’s, the format was often a DNG or a high-resolution TIFF. Camera raw is not considered archival because it is a proprietary format.