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Digital Data Preservation & Future Access

by Bob Kern

Although digital technology has greatly improved the creation and distribution of information, it is not a reliable method of preserving critical data that requires long-term access. Digital storage systems components have no proven track record of preservation and it is believed that even today's best methods might last for 50 years. Even if stored data integrity was not a concern, having the software and hardware to access data in the future is the greater threat because of the on-going evolution of digital recording and output software and hardware systems.

Documents common to industrial markets include engineering drawings, schematics, plats, maps, and various forms of architectural information. Much of this data must be available for future access and referral. Some documents have more short-term requirements and may not require "lifetime" access and output. It is, therefore, suggested that the "life expectancy" of digital information be considered when data is stored for future reference. As a backup to digital storage, many reprographers and information service providers are using photographic intermediates as archival hard copy. In many instances, reduced size photographic intermediates are being stored in project binders and provide "readable" copies of critical data. These intermediates can be enlarged on conventional copying and duplicating systems for use in generating bid sets or for on-site use at construction projects or for generating full-size photographic reproductions. Since the life expectancy of photographic intermediates and full-size reproductions is at least 500 years according to the American National Standards Institute (ANSI), when properly imaged and stored they can be re-scanned to restore data that has been digitally corrupted, lost, or cannot be accessed due to software or hardware obsolescence.

The American National Standards Institute has developed testing methods to forecast the Standard Life Expectancy (SLE) of various forms of digital data storage systems. ANSI's Life Expectancy predictions are based primarily on the storage conditions that include temperature and relative humidity parameters of 25˚C and 50% RH. The results do not include the frequency of handling or playback of the digital file in various systems. The most widely used digital recording and storage mediums have the Standard Life Expectancy as estimated by the listed ANSI testing methods:

Compact Discs (CD-ROM) ANSI/NAPM IT9.21-1996 – 3.65 Years

Recordable Computer Disc Systems ANSI/PIMA IT9.27-1999 – 10.5 Years

Magnetic-Optic (MO) Disks ANSI/PIMA IT9.26-1997– 7.7 Years

The above ANSI documents can be ordered through:

American National Standards Institute, 11 West 42nd Street, New York, NY 10036

The ANSI Standard Life Expectancy for silver-gelatin type black-and-white film estimates photographic B&W film to have a Standard Life Expectancy or useful life of 500 years. This document, ANSI/ISO 10602/ANSI/NAPM IT9.1-1996 is also available through the American National Standards Institute.

Audio CDs are often compared to other forms of digital data where the loss of data is nearly unrecognizable as the human ear has difficulty in perceiving changes in the playback sound. Minor data losses in this type of audio reproduction are insignificant compared to visible information loss that is more closely integrated in the composite data stream.

Other tests of digital data storage systems have confirmed the ANSI conclusions. The National Media Lab, a part of the National Technology Alliance, has performed tests that have shown that magnetic tapes, disks, and optical CD-ROMS have short life expectancies. VHS tapes used for digital storage have become partially unreadable after 10 years and CD-ROMS of average quality have become unreadable in as little as 5 years in some cases.

When the longevity of the data storage medium and the obsolescence of software and hardware systems are considered, it becomes even more important to have critical data preserved on a visible system that displays its information and its potential for failure. Digital systems will only display data loss when it becomes too late to recover. It is, therefore, suggested that data with long-term access requirements be "backed-up" with photographic intermediates. In the event of digital data loss, the photographic copy can be rescanned to restore the digital data.

Numerous reports of output onto nonphotographic polyester or paper have proven to fail due to toner “flaking” or media degradation. Output from most commercial copier systems has been known to deteriorate or exhibit loss of image in one way or another. We have all seen examples of copier reproductions that have “offset” from one copy to another when stored in conventional files or cabinets. If you use a digital copier or printer to output your digital files as hard copy archives, it is highly recommended that you know what the archival, or “Life Expectancy” is of that particular media, ink, or toner. Ask your supplier to provide, in writing, a “statement of archivability” from an independent source where the product was tested under qualifying industry standards.

Until the government provides durability standards for digital printing systems, only photographic film has a proven track record of preserving historical documents generated on digital systems. The combined risk of digital data loss and the ability to output the data on future systems makes data preservation nearly as important as the purpose it was generated in the first place.

Information on photographic archiving is available from your regional Agfa Technical Sales representative.

In support of the information presented, a copy of "Addressing Our Digital Memory Crisis" is included in this mailing with permission of the Council on Library Information Resources. Questions and inquiries about digital information and future access will be welcomed by the CLIR.

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