Standardization Activities on the Permanence of Magnetic Imaging Materials

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Introduction

The writing of standards is an important feature of the highly technical society that we live in. The most obvious advantage is that they promote the interchangeability of materials and equipment. In the field of electronic imaging, this applies to physical dimensions and formats of magnetic materials and optical disks. However, the advantages of standards are less obvious, but nevertheless very important, when we consider the permanence of electronic imaging.

Permanence standards make several important contributions to the conservator, curator, archivist and librarian.

1. They represent a consensus of the best thinking in the field. This eliminates the need for curators to keep abreast of the latest publications in areas where they may not be trained.
2. They serve as a means to resolve differences of opinion between experts where hard facts are frequently difficult to ascertain.
3. They improve quality of products available to the user by establishing specifications.
4. They increase consumer awareness of the importance of permanence and establish criteria for proper handling and storage.

In the United States, national standards are the responsibility of the American National Standards Institute. The permanence of imaging materials falls within the scope of Technical Committee IT9. In 1989, this Committee formed a subcommittee with the specific objective of preparing standards on the permanence of electronic materials.

The initial impetus for this subcommittee was the confusion which existed between the photographic, magnetic, and optical disk technologies on their different uses of the word "archival". This confusion has been resolved and there has also been slow but significant progress on other issues.

Magnetic Materials

Work was started on the preparation of a specification for the stability of magnetic tape. Such a specification would provide criteria with which to rate the permanence of different products.

Magnetic tape is relatively thin, the thinner material providing greater data compaction but less physical protection. The net result is that tape life is usually controlled by physical failure, and this physical failure can be manifested in many ways depending upon the format, the recording device and the playback equipment. In some situations, tape fails by binder debris clogging the magnetic heads while in others it may be due to high friction and the resulting lack of uniform transport. This necessitates a

tape specification that includes a considerable number of physical tests. Standardization requires agreement on the physical properties to be included, the test equipment and procedure, the means of accelerating the test or incubation conditions in order to estimate life expectancy, and the determination of limits for failure.

During five years of deliberation, the subcommittee recognized that the critical physical properties are binder cohesion, binder-base adhesion, friction, clogging of magnetic heads, dropouts, and binder hydrolysis. Magnetic properties of interest are coercivity and remanence. Test procedures for adhesion, friction, hydrolysis were agreed to, but cohesion and dropouts are difficult to measure requiring extensive development work. The latter is also very system dependent. Unfortunately, involvement by tape manufacturers has recently decreased to the point where there is no longer a critical mass to continue this activity. This leaves the consumer without a recognized specification to compare tape products and the manufacturers without a standardized procedure to evaluate tape life. The only option for the user is to purchase tape with recognizable brand names.

In another area, there has been good progress. It is a well-accepted fact that good storage conditions will prolong the life of all tapes. The accepted recommendations of major contributors in this field have been incorporated into a specification on magnetic tape storage. This document includes recommendations on humidity, temperature, and enclosure materials. This storage document recently passed the required balloting procedures and should be published in 1996.

Work is to be started on recommended handling practices.

Hardware Considerations

Magnetic materials require the necessary hardware recover the information. Hardware wear and particularly hardware obsolescence are serious concerns and the problem this poses has been recognized for many years. Currently there is no activity underway with Technical Committee IT9 to standardize on hardware. However desirable this approach may be, it is not practical because it would inhibit the development of technology and would never be supported by the manufacturers. From a users viewpoint, neither the creation of a single readability standard nor maintaining obsolete playback hardware will guarantee the survival of information on electronic materials. The only practical approach is a well-managed program of refreshing and migrating stored data from one system to a newer one as obsolescence proceeds.

Conclusions

Standards on the permanence of magnetic imaging materials are a recognized need because of the widespread and growing use of this technology to preserve information. While progress has been made, a great deal of work still remains.

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