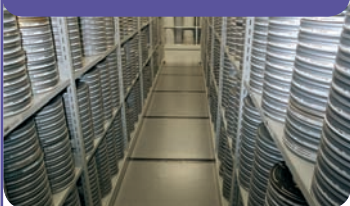


'The digital dilemma' – Academy

Flashback to 1913: A newspaper critic asked legendary stage actress Sarah Bernhardt why she was appearing in 'low brow' motion pictures instead of concentrating on performing in plays. The legendary actress responded that she performed in movies for posterity. The sad reality is that an estimated half of the films produced in the United States during the first century of the industry have been lost to posterity.

"Even some of the artists who are the most evangelical about the new world of digital motion pictures sometimes seem not to have thoroughly explored the question of what happens to a digital production once it leaves the theaters and begins its life as a long-term studio asset."



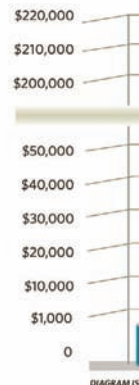
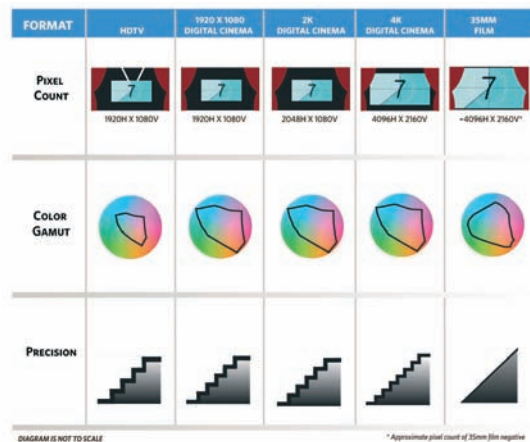
During the late 1970s, Martin Scorsese issued a clarion call warning that the irreplaceable heritage of an important art form was at risk. His persistence led to significant advances in practices for restoring and archiving films.

In 1990, Scorsese and other cutting-edge directors founded The Film Foundation, which became a significant force in heightening awareness, and funding the restoration and archiving of hundreds of classic films.

A *New York Times* article written by Michael Cieply December 23, 2007 put the financial value of effective archiving into perspective. It cited a report issued by Global Media Intelligence which stated that approximately one-third of the \$36 billion dollars in annual revenues earned by the Hollywood studios comes from their libraries.

Another giant step forward was taken last November when the Academy of Motion Pictures Arts and Sciences released a comprehensive report titled 'The Digital Dilemma' with the subtitle 'Strategic Issues in Archiving and Accessing Digital Motion Picture Materials.' The 75-page report was co-authored by two respected authorities, Andy Maltz, director of the Academy's Science and Technology Council, and preservationist Milt Shefter.

Visual Attributes of Image formats



A line in the foreword states the mission: "Even some of the artists who are the most evangelical about the new world of digital motion pictures sometimes seem not to have thoroughly explored the question of what happens to a digital production once it leaves the theaters and begins its life (if all goes well) as a long-term studio asset."

The year-long study was launched during the winter of 2005 after Phil Feiner, chairman of the Academy's Digital Archiving Committee, proposed a summit conference with studio archivists and technology leaders, and their counterparts in other organizations, including government agencies, healthcare, universities and astronomers.

"This is the first time the chief technology officers and archivists from the studios and other peer public institutions as the Library of Congress, UCLA archives, and the Association of Moving Image Archivists met to discuss this preservation issue," Shefter says.

"The Academy is not an advocacy organization," Maltz adds. "We got people who know and care about the importance of archiving together to discuss the issues and to determine the questions that needed to be asked and answered. The report is a

summary of our findings. More than 70 experts were subsequently interviewed."

Just to put that comment into perspective, in 1999 scientists at NASA discovered that they were unable to read digital files describing images that the Viking space probe sent back to Earth in 1975, because the data was in an obsolete format.

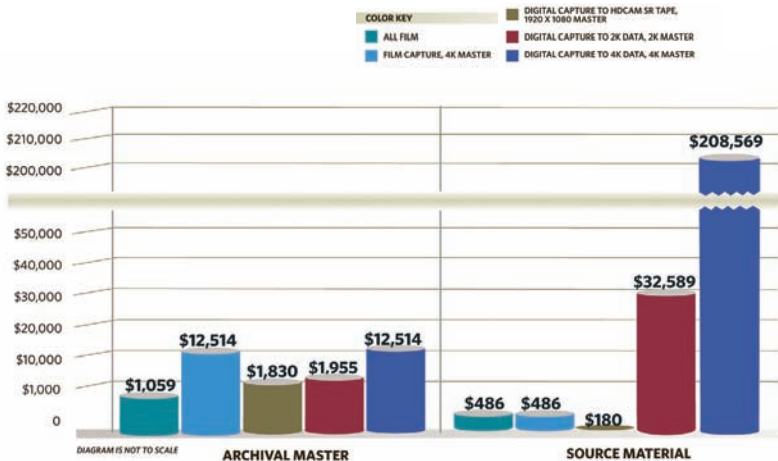
Inexpensive process

Shefter observes that all Hollywood studios have been archiving their feature films, including the original negative and intermediate stocks, YCM (yellow, cyan and magenta) separations on stable black-and-white polyester film in humidity-and-temperature-controlled environments for the past 40 years, and in some cases longer.

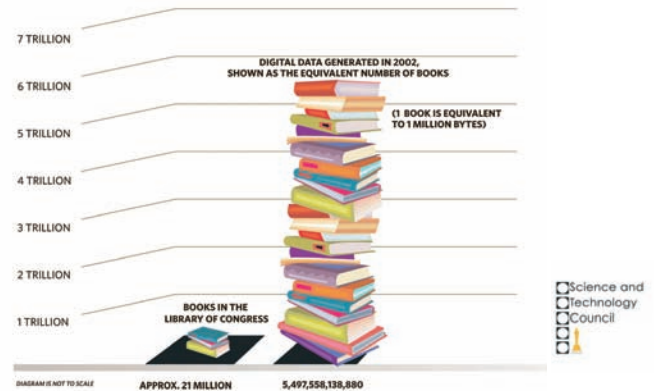
"I once calculated that the average feature film generates 300 boxes of negative, interpositives, YCM film, B-negative and outtakes, plus scripts and notes," Shefter says. "The YCMs can be used to reproduce the original negative without compromising the images. It's an inexpensive process compared to digital archiving costs."

report addresses future of today's films

Annual storage costs of motion picture materials



How much data, 2002 - Book equivalent



A recent article published by the DGA Quarterly quoted Feiner who observed that when *Superman Returns* was produced in digital format in 2006 it generated an estimated 200 terabytes of data. A single terabyte equals 1,000 billion bytes of data.

Feiner asked, "What do you do with all that information?"

Shefter notes that *I Love Lucy* and other programs produced by Desilu Studios some 50 years ago are still in TV syndication because they were properly archived.

"I worked at CFI labs for years," Shefter says. "We had the films from the Desilu programs stored in our vaults. The original programs were produced on black-and-white film and later ones were on color negative. Desilu archived film from their TV programs in the lab's vault not realizing that they would become valuable. Some of these programs are still syndicated on television, providing revenues."

'The Digital Dilemma' report focuses on Hollywood studio films. It compares both practices and costs for digital and photochemical archiving. The report cites a general agreement that because of the degradation of signals and the obsolescence of formats and standards, digital media is much more volatile than film. There is a

consensus that digital files should be migrated every four to five years to ensure their accessibility.

The Academy reports that the annual cost of archiving a digital master file for a feature is about \$12,514 compared to around \$1,059 for film. The report stated that the cost for properly archiving all relevant elements of a motion picture produced in digital format at \$208,569 a year. The report also reported that a digital media hard drive can "freeze up" in as little as two years and DVD files will eventually degrade—about half are not expected to last longer than 15 years.

The report also focused on the use of digital intermediate (DI) technology for mastering motion pictures produced in both film and digital formats. The timed masters are used to produce both digital and 35mm release prints for cinemas.

More than 20 post-production facilities in the U.S. alone are currently providing DI services today. There are no official statistics documenting the percentage of motion pictures that are digitally mastered. Estimates range as high as 70 to 80 percent. After offline editing, the cut negative is scanned at resolutions ranging from HD to 2K and 4K

depending on the producer and budget. Motion pictures that are released to cinemas are recorded onto 35mm film, which can become an archival record of the final cut.

Struck a nerve

"What is going to happen 20, 30 or 50 years from now, when someone wants to re-release a director's cut including outtakes?" Shefter asks.

It is a rhetorical question. He observes that unless content owners are committed to migrating the DI masters and the digital files of outtakes to new formats and standards every four or five years, the chances are that they will be lost to posterity.

"It is important for producers to understand that the digital master files being generated today are not an archival medium that you can take off the shelf in five to 10 years," Shefter says. "One alternative is to record out to film and make YCMs. However, the only record being preserved is whatever is on the DI."

While 'The Digital Dilemma' report focuses on studio films produced for cinema release, it generated questions about television shows produced on film that are post-produced in HD format. Maltz notes that producers can archive the original and cut negative, but the HD master raises the same concerns as DI masters do in the feature film industry. Will the digital HD files and tapes degenerate? Will the compatible hardware needed to read and re-master the files be available in the future? How will the software evolve? Will tomorrow's audiences have 2K and 4K resolution television sets in their homes?

"The report seems to have struck a nerve," Maltz concludes. "Our goal was to make people both inside and outside of the industry aware of this important issue."

The alternative to finding solutions is the chilling conclusion of Cieply's New York Times article. He foretells that future audiences could be watching Wallace Beery movies long after contemporary films produced and/or archived in digital format are gone. Note: Beery was in Hollywood films from 1913 through 1949.