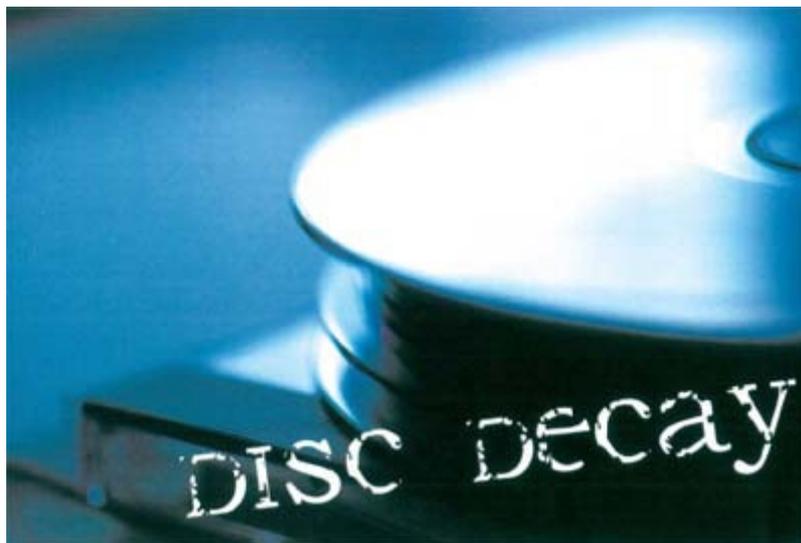


*"Although all CD-Rs look the same, research and laboratory testing by some of the most prestigious archiving departments in Australia have proved that not all CD-Rs are equal. In fact, results show there are incredible differences in original quality and longevity. Some record data well initially but deteriorate shortly afterwards, whereas others maintain stability over a number of years. Rodney Appleyard reports on the CD-Rs that have met the approval of the ABC, the National Library of Australia, the National Archives of Australia and the State Library of Victoria, and the ones that did not make the grade."*



Heading for a wipeout?

By Rodney Appleyard

CD and DVD storage is still heavily relied upon as a source of back up for critical data in large organisations throughout Australia, despite research claiming that these discs are not secure as long-term storage devices. Are these organisations taking a major risk or do they have every reason to feel confident? Rodney Appleyard investigates.

A survey conducted recently in Holland claimed that CD-Rs would not be readable after two years. Thirty different brands, from both well known and lesser known manufacturers, were tested over the course of twenty months. Many of these discs simply would not work after this time. Surprisingly, they stored the CDs in a closed cabinet for two years in their original packaging too. In addition, they discovered that Recordable DVDs are even more susceptible to deterioration and have a shorter lifespan than CDs.

The survey concluded that it is not right for people to presume that CD-Rs can last for at least 10 years, let alone 100 years, which some manufacturers claim.

This research is backed up by Jeff Rothenberg, who released a report called "Avoiding Technological Quicksand: Finding a Viable Technical Foundation for Digital Preservation" in 1998. Rothenberg discovered serious shortfalls in storing information with the use of digital technology. He claims that there is not yet a viable long term strategy to ensure that digital information will be readable in the future.

"Digital documents are vulnerable to loss via media decay and obsolescence. There is reasonably widespread (though by no means universal) awareness of the fact that digital storage media have severely limited physical lifetimes. The National Media Lab has published test results for a wide range of tapes, magnetic disks, CD-ROMs, and other media, showing that a tape, disk, or even CD that is picked at random (that is, without prior evaluation of the vendor or the specific batch of media) is unlikely to have a lifetime of even five years."

Rothenberg also claims that it is nearly universally recognised that digital information must be copied to new media (refreshed) on a short cycle-every few years. The danger here is the potential for data to be corrupted when documents are compressed or encrypted onto a new format.

He says the biggest problem is that CDs and DVDs will not be readable as new hardware systems develop. Therefore the format lacks compatibility since it cannot keep up to date with future technological developments.

Other reports have revealed that poor adhesives could cause layers to split in DVDs. Melodie Gee, Vice President and General Manager of Content Delivery Solutions, with Metatec International in Columbus, Ohio says it is "very important that proper mastering (is conducted) and the use of DVD test equipment is needed to verify the discs."

There is a risk in reliability too because there is not a consistent standard across CD/DVD formats. Another recent survey tested discs exposed to sunlight. Some survived over 2500 hours, whilst other failed after 500 to 1000 hours.

However, Russell Cooper, the manager of Business Application Services at the Department of Land Information in Western Australia, disagrees. He is fully confident that he will not experience any difficulties with his DVD archival system. The DLI in Western Australia is responsible for providing land and property information; securing land titles and land valuation services, maps from aerial and satellite images and data from ground surveys. This information is used to produce a wide range of digital and hard copy products and services.

All of this data is currently stored on DVDs stored in two Pioneer Document Records Management Jukebox towers. Each tower can contain between up to 720 discs. It took a year to convert 8 million files from an old Kodak Jukebox optical system and only 77 of those files were corrupted during the move.

A PC application can retrieve information instantly, through their mainframe, about mortgage applications, mortgage changes, registration for pieces of land and legal cases over land needed for the courts. This can be automatically faxed from the DVD to the relevant customer or member of staff. Between 25,000 and 35,000 pages are processed through the system every day, and 8,000 to 9,000 orders are made.

Cooper believes the new system is very reliable, easy to use and secure, and he doesn't believe that there is any threat to the longevity of the discs.

"When we first tested the system, my bosses were looking for an archival licensor for 25 years. We don't expect an IT system to last for 25 years, but we aim to do a storage upgrade every 10 years. That refresh process is something we would go through regardless of the change in technology and I would definitely expect these systems to last more than a couple of years. That's what our technicians have told us.

"We couldn't run our registry if the technology was going to be flaky after a couple of years, so I don't have a major concern with DVDs at the moment."

Andrew Buttil, Software Support and Development Manager at eiStream backs him up too. eiStream provides the storage management software, archival software, management software, and the imaging system for the DLI. He believes that DVD storage is very secure.

"The report on CDs/DVDs deteriorating after two years is pretty vague. Longevity for them is really

determined by many factors, including things like how the data is stored, in what conditions and relative humidity the discs are stored in. Also, the quality of the mediums used. You can get very cheap CDs/DVDs, or even get CDs/DVDs of a more irreparable nature. In addition, it depends on how they are handled in regards to people touching them with their fingers, and whether they have contaminating materials on them.

"My feeling is if CDs/DVDs are kept in the right conditions, they should work to store data reliably for 50 to 60 years. There are different types of CDs/DVDs too. For instance, DVD Ram is generally not considered to provide high archival quality as something such as DVD-R. DVD-R is based on the same technology as CD-R. Some different formats are better than others."

He also refuses to accept that arguments over the refresh process, issues of compatibility or the risk of information being corrupted deserve to be considered seriously as deterrents against using CD/DVD storage. Instead, he believes that migration should be an automatic aspect of an organisation's storage policy because managers should always be looking to upgrade their technology, rather than change systems due to CD/DVD deterioration.

"It really comes down to how you handle and store your DVDs. It's fine to do a refresh after a certain period of time. Certainly what we expect is that customers should move their data to a more updated technology every ten years. We expect now that DVDs are going to quadruple in capacity over the next two to three years. So we believe that customers are likely to actually migrate their media to a newer technology when it becomes available. So while this medium of today is being cared for the specific environment, it will only be natural for that data to be migrated again one day to new technology in an improved storage environment."

Robert Archer, Managing Director of Gosford Micrographics, disagrees and believes that CDs and DVDs do not come anywhere close to reliability compared to microfilm. He says the difficulty is that there is not a traditionally recognised international body of standards which recognises the longevity of CD/DVD types of storage, whereas microfilm has had its standards confirmed over the course of 30 years.

"The problem is, manufacturers guarantee the replacement of CDs/DVDs, and people like Kodak say that their guarantee is available for 100 years. But a lot of the data has the potential to be lost. They are being sold in a computer style environment, which is different in thinking from the records management environment. You have to keep copying their data from CDs/DVDs onto a new medium every two to three years to safeguard your investment.

"But records on a microfilm are permanent. We'll find out in the next ten years just how secure large data can be stored on CDs/DVDs. Recently, the U.S. census lost a lot of data which was stored on CDs/DVDs, and since then, has decided to use microfilm material to store its data in the future. Microfilm can last for 300 years.

"However, I can see the appeal of CDs/DVDs. They are much more accessible via computer networks. It's easier to browse for information, whereas microfilm can be quite cumbersome. The best answer is to combine the two together, using Hybrid systems. Use the microfilm as a permanent back-up, then digitise the information so that it can be stored and retrieved via a CD/DVD, but always, keeping the information backed by microfilm."

So the evidence seems inconclusive. CDs/DVDs seem to be working well as storage devices for the time being, but the true test will come over the next 10 years, when we will be able to see if data really does stay on these records in their 100 percent accurate form, as promised by the manufacturers.

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