



Keeping ahead of the race against time

Beware Back-up Data Loss

When personal computers were invented, one of the big ideas they inspired was that of the “**paperless office**”: that in the brave, PC-powered future, we wouldn’t need printed copies of every document. “Paperwork” could be eliminated with record-keeping easily managed by our shiny desktop machines.

Thirty years later, and the bold vision still hasn’t been fulfilled. Offices are drowning in more pulp products than ever. Everything is still printed out and stored: orders, correspondence, reports, memos, files. Cabinets and recycling boxes overflow while paper shredders are constantly busy making more room.

We are saddled with antique ways of storing data although most business is now done via the Web and email. It’s even more ironic considering that the costs of scanning and storing digital information are dropping all the time. Why isn’t everything digital already?



Incredibly shrinking memory

One major reason is that technological progress is relentless and unstoppable. Why bother committing to *any* system when something easier, cheaper, and with far more capacity will come along soon?

Nowhere is this more obvious than with storage media. As **Moore’s Law** famously predicts, the number of transistors that can be placed on a chip doubles every 2 years or so. This means that as size regularly shrinks by half, memory doubles, and the price drops accordingly. Which is how the gone-but-not-forgotten obsolete **floppy disks** shrank from 8 inches that could only carry 175KB in 1972 to a mere 3 1/2 inches that held 2.88MB just fifteen years later – over *16 times* the data cheaply in a far smaller space.

Predictions that technology is finally reaching the limits of Moore’s Law have been almost as regular as its progression, but it hasn’t happened yet. Instead, there has been a constant churn in storage devices – floppies, Zip, hard and flash drives, CDs have all had their heyday and sooner or later are replaced.

Planned obsolescence is a major factor in all this. As software evolves, older data formats are less and less supported, and eventually even the hardware goes too. But this obscures the ultimate factor that limits data storage and archiving: *all media eventually dies*.

CD or not CD

All things must pass. Paper rots; parchment, too; though much more slowly. Magnetic media eventually lose their charges. **Compact discs** decay also in their own fashion, and that is creating a crisis of sorts because of their widespread adoption not only by individuals but by big institutions dedicated to preserving the past. In the 1990s, museums, historical societies, symphonies, and libraries were quick to replace microfilm and tape recordings with the new digital media which were so much easier to search.

The silvery platters were similar to the then-familiar phonograph records, only using laser light to make or read indentations rather than a mechanical stylus. Vinyl records can be kept for decades in a cool, dry place, and it was assumed that CDs should hold up even better. After all, there is much less physical wear

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involved. As long as the platters weren't scratched or left in a hot car, many thought they'd last indefinitely.

The **Library of Congress** has recently determined that this is *not* so, even in carefully-controlled, stable environments. They found that *all* CDs degrade, but frustratingly, at vastly different rates. With so many different manufacturers and practices, it's impossible to predict how long they'll last, even on average.

On an audio CD, the effects of **CD rot** can be heard in crackles and distortions before it becomes unusable. An early form of disc rot, called bronzing, where the disc looks coffee-stained, only occurred to CDs made in Blackburn, Lancashire between 1988 and 1993. But different kinds of decay happen to other CDs, and by extension to **CD-RWs**, **DVDs** and **Blu-rays** as well.

The silver coating can flake off from the edges. Chemicals in the printed label can react with the data surface and cause problems, too. Most damage other than scratches and fingerprint etching, by the way, is usually not on the *clear* side, but the *label* side under which the data is stored. It can be seen sometimes by holding the disk up to the light. Any pinpricks that show up are spots where the data is missing.

Supposedly these problems were solved several years ago, but as there are now fewer manufacturers and still no standards, lifespan is still pretty much a guessing game. It's such a problem that there are **websites** offering home cures to keep disks alive.

Theoretically, if archival CDs are stored properly and used rarely and with extreme care, they could last a century. Of course, normal active use and wear will degrade them much quicker. Generally, magnetic media are expected to last *10 to 20 years*, optical disks 30 or more. Many government institutions advise checking every year and recopying information at least once a decade. However, with the lack of industry standards, your own mileage may vary wildly.

Digital Media Capacity and Years of Usefulness*

Medium	Year	Capacity	Active*	Archive*
Hard Drive	1956	3.75MB-up	34 yrs.	100 yrs.
5" Floppy	1976	87.5KB	2 yrs.	30 yrs.
3.5" Floppy	1982	264KB	2 yrs.	15 yrs.
Digital Tape	1986	24GB	10 yrs.	30 yrs.
CD-RW	1997	650-800MB	3 yrs.	100 yrs.
DVD-R	1999	4.7-27GB	30 yrs.	100 yrs.
Flash Drive	2000	256MB-up	10 yrs.	75 yrs.

* Lifespans are estimated from simulations, not actual user experience.

Transcending time in the cloud

With such uncertainties, it's no wonder that so many people and institutions cling to the old ways, at least as back-up. But paper records are a grossly inefficient way of preserving data, take up lots of space, and can be much more difficult to search through for specific items. The best thing that can be said in paper's favor is it can still be read if the power goes out.

Along with entropy, digital media are also subject to the obsolescence of machines and software that can read and use them. Unfortunately there's no way to predict which can best withstand the test of time, but it helps to store data in formats which have already lasted some time. Thus, saving text in the old **Rich Text Format** (RTF) as well as in the current format Office uses may keep it readable by other programs. Some experts advise keeping an older computer system and software installation disks on hand, too.

But the only sure way to keep information alive indefinitely evolved eons ago: it must be **reproduced**. Fortunately, this doesn't have to be left to your own devices. **SWCP BUS** can make it simple and easy.

SWCP BUS is a cloud-based back-up system. It uses several sets of servers in different safe off-site locations with redundant copies of your files. This means that in the event of power or hardware failure, your data lives on, stored safely on another machine.

SWCP BUS is fast, efficient, and reliable. Data is downloadable anywhere with a web browser for no extra fees. With encryption, your data always stays private; your photos belong *only* to you. It's automatic and incremental, adding only new or changed data. Plus, there's a *discount* for **SWCP** broadband users, too.

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