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Digital doomsday: the end of knowledge

02 February 2010 by Tom Simonite and Michael Le Page
Magazine issue 2745. [Subscribe](#) and get 4 free issues.

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Top of the pops

What's more, what is likely to survive the longest from today's digital age is not necessary the most important. The more copies - backups - there are of any piece of data, the greater the chances of its survival, discovery and retrieval. Some data is much copied because it is so useful, like operating systems, but mostly it is down to popularity.

That means digital versions of popular music and even some movies might survive many decades: Abba might just top the pop charts again in the 22nd century. However, there are far fewer copies of the textbooks and manuals and blueprints containing the kind of distillation of specialised knowledge that might matter most to those trying to rebuild civilisation, such as how to smelt iron or make antibiotics.

Perhaps the most crucial loss will occur after half a century or so, as any surviving engineers, scientists and doctors start to succumb to old age. Their skills and know-how would make a huge difference when it comes to finding important information and getting key machinery working again. The NASA tape drives, for instance, were restored with the help of a retired engineer who had worked on similar systems. Without expert help like this, retrieving data from the tapes would have taken a lot longer, Cowing says.

A century or so after a major catastrophe, little of the digital age will remain beyond what's written on paper. "Even the worst kind of paper can last more than 100 years," says Season Tse, who works on paper conservation at the Canadian Conservation Institute. The oldest surviving "book" printed on paper dates from AD 868, he says. It was found in a cave in north-west China in 1907.

A century or so after the power goes off,
little will remain of the digital age except
what's on paper

Providing books are not used as a handy fuel, or as toilet paper, they will persist for several hundred years, brittle and discoloured but still legible. Again, though, the most popular tomes are the most likely to survive. Imagine risking your life exploring dangerous ruins looking for ancient



Information is stored in many forms, but will it be readable in the future?

(Image:WesternWolf/Flickr/Getty)

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wisdom only to find a long-hidden stash of *Playboy* magazines.

It is not just what survives but the choices of those who come after that ultimately decide a civilisation's legacy, however. And those doing the choosing are more likely to pick the useful than the trivial. A culture of rational, empirical enquiry that developed in one tiny pocket of the ancient Greek empire in the 6th century BC has survived ever since, says classicist Paul Cartledge of the University of Cambridge, despite not being at all representative of the period's mainstream culture.

As long as the modern descendant of this culture of enquiry survives, most of our scientific knowledge and technology could be rediscovered and reinvented sooner or later. If it does not survive, the longest-lasting legacy of our age could be all-time best-sellers like *Quotations from Chairman Mao*, *Scouting for Boys* and *The Lord of the Rings*.

Store it for millennia

The current strategy for preserving important data is to store several copies in different places, sometimes in different digital formats. This can protect against localised disasters such as hurricanes or earthquakes, but it will not work in [the long run](#). "There really is no digital standard that could be counted on in the very long term, in the scenario that we drop the ball," says Alexander Rose, head of [The Long Now Foundation](#), a California-based organisation dedicated to long-term thinking.

Part of the trouble is that there is no market in eternity. Proposals to make a paper format that could store digital data for centuries using symbols akin to bar codes have faltered due to a lack of commercial interest and the challenge of packing the data densely enough to be useful.

Perhaps the only data format that comes close to rivalling paper for stability and digital media for data density is the [Rosetta Disk](#). The first disc, made in what its creators call 02008, holds descriptions and texts of 1000 languages.

The nickel discs are etched with text that starts at a normal size and rapidly shrinks to microscopic. At a size readable at 1000 times magnification, each disc can hold 30,000 pages of text or images. The institute is considering creating a digital version using a form of bar code.

If we did have a way to store digital data long-term, the next question would be what to preserve, and how to keep it safe but easily discoverable.

Tom Simonite is a technology news editor at New Scientist

Michael Le Page is a features editor at New Scientist

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10:00 06 March 2010

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We're Too Used To Progress

Thu Jan 28 10:04:47 GMT 2010 by [Bee](#)
<http://backreaction.blogspot.com/>

An excellent update on a topic we should all spend much more thought on. We are very used to progress, but it's only a matter of time till we will have a period with regress. The question is then whether that step back will cause positive feedback, resulting in more regress. This doesn't necessarily have to be a major disaster, but can happen very slowly. The way knowledge is stored and passed on to future generations is a key factor.

Especially those who are so eager to promote online-only scientific journals should be aware that they are implying constant progress. It is true what Simonite and Le Page write that most of today's scientific data isn't terribly useful when it comes to rebuilding civilizations. But think about the more likely case in which civilizations are not entirely destroyed, they just crumble away. Fewer and fewer people might be able to afford a computer, have internet access. Fewer and fewer universities will be able to access digital knowledge. Slowly, this knowledge which was once readily available (at least in the developed world) would become not entirely lost, but costly, remote, and finally forgotten. As a consequence, we'd have to re-discover what we already knew, a terrible waste of time and resources.

I wrote a related article on the issue some time back here: a href="<http://backreaction.blogspot.com/2008/01/cast-away.html>" Cast Away /a .

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We're Too Used To Progress

Tue Feb 02 17:13:21 GMT 2010 by [Jim Reed](#)
<http://mobileuser.mobi/new/141/firefox-mobile-sophisticated-as-hell-but-still-does-not-run-flas/>

The solution is to off world store the knowledge. I'm thinking a robotic lunar lander that broadcasts a loop via solar power with tutorials on basic knowledge and science. Off site back up is always the best for data security.

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We're Too Used To Progress

Sat Feb 06 18:04:42 GMT 2010 by **Elowise Fortuna**
<http://watch-olympics-online.co.cc>

Well they could just use solar winds, which get pulled through by the sun's gravity and since Earth is the 3rd closest planet to the sun - we should be able to pick it up from our planet. Of course we'd need to have receiving stations scattered across the planet to compensate for the earth's rotation. This may not make sense in writing, but it does in my head.

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We're Too Used To Progress

Thu Feb 04 23:55:06 GMT 2010 by **Billt**

I agree, there need to be centres of knowledge repository set up specifically to maintain ongoing knowledge in the event of 'catastrophe'. Just as the monastories of the middle ages kept the flame of knowledge alive through the dark ages, these knowledge centres will need to be self-supporting in the event of collapse outside.

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We're Too Used To Progress

Fri Feb 05 02:23:32 GMT 2010 by **Madmartagyn**

If civilization went belly up tomorrow, there would still be millions of libraries with books called "How Things Work. Vol I", etc.

Basic engineering, chemistry and physics would be readily available to any survivors in the short to medium term. The problem would be in ensuring a literate second generation. If they were all farmers / hunters then goodbye electricity.

But, why would civilizations "crumble away"? There is no economic or political driving force to suggest that this could happen - the privileged will always protect their way of life, and they have the resources to do so. The rest of the world could go to hell in a handbasket, but North America, Europe, Japan, Australia and any other enclaves of wealth will survive in one form or another. The downfall of Rome is not a precedent - they didn't have tanks or ICBMs!

My personal prediction is that if Humankind can last with a technological civilization for another 1000 years, then we will probably be around for millions of years. If we can get enough people off this planet and onto other planets, the species will survive whatever the Universe can throw at us.

Having survived the Cold War, I'm very optimistic about the future. Now we just need someone to discover the FTL drive ;-)))

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No Problem! Memory Is Stored In The Spacetime!

Thu Jan 28 14:57:04 GMT 2010 by **Peter**
<http://www.hydrogen2oxygen.net>

Where are our thoughts written?

Surely not in our brain. Scientists already proofed this fact, that memory is not stored in our brain, but in some kind of holographic pattern in the Spacetime (that is itself self-similar like a fractal).

So the possibility that a global solar electromagnetic impulse occurs and that will destroy all electronic circuits is in a range of possible scenarios in near future.

Another possible scenario is that humankind will achieve the (biological) ability to (re)connect wireless directly to the memory stored in the Spacetime. When this happens Internet will not be necessary anymore.

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No Problem! Memory Is Stored In The Spacetime!

Tue Feb 02 13:28:28 GMT 2010 by **oji**

> Scientists already proofed this fact, that memory is not stored in our brain

They did? Really? Any reference for that? Preferably a peer-reviewed journal rather than a crank website...

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No Problem! Memory Is Stored In The Spacetime!

Fri Feb 05 09:51:42 GMT 2010 by **Peter**
<http://www.hydrogen2oxygen.net>

Search for following keywords:

- "DNA Phantom"
- "Sir John Carew Eccles"
- "Nikola Tesla" (about individuality)
- "Michael Talbot"

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No Problem! Memory Is Stored In The Spacetime!

Thu Feb 11 16:37:19 GMT 2010 by **Bob**

Yes, scientists probably "proofed" this theory and then sent it back to the author with some suggestions for changes.

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No Problem! Memory Is Stored In The Spacetime!

Tue Feb 02 14:08:58 GMT 2010 by **Necro**

Isn't this the Akashic Records? I didn't know they had been scientifically proven.

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No Problem! Memory Is Stored In The Spacetime!

Tue Feb 02 17:09:06 GMT 2010 by **Twozero**

It's been proven in the same way that it's been proven the world will end in 2012.

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No Problem! Memory Is Stored In The Spacetime!

Tue Feb 02 18:34:07 GMT 2010 by **Polemos**

"Where are our thoughts written? Surely not in our brain. Scientists already proofed this fact, that memory is not stored in our brain, but in some kind of holographic pattern in the Spacetime (that is itself self-similar like a fractal).

Another possible scenario is that humankind will achieve the (biological) ability to (re)connect wireless directly to the memory stored in the Spacetime. When this happens Internet will not be necessary anymore."

You are absolutely right, Peter. We are heading towards a tech-free singularity. Teleportation, psychokinesis, eternal youth. We shall be able to re-materialize, out of the universal hologram, any thing that existed in the past. The onset of the singularity will begin on 31 May 2010 AD.

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No Problem! Memory Is Stored In The Spacetime!

Tue Feb 02 22:11:23 GMT 2010 by **dmleeman**

woohoo!

I can't wait, that'll be even better than the World Cup

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No Problem! Memory Is Stored In The Spacetime!

Tue Feb 02 22:51:41 GMT 2010 by **Jospeh**
<http://www.timesignaturestudios.com>

This guy is a genius.

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No Problem! Memory Is Stored In The Spacetime!

Thu Feb 04 00:10:05 GMT 2010 by **momove**

And all I was looking forward to was the Winter Olympics! Bring it on!

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No Problem! Memory Is Stored In The Spacetime!

Thu Feb 04 08:10:49 GMT 2010 by **MaDeR**

"The onset of the singularity will begin on 31 May 2010 AD."

Oh dear. You made a VERY big mistake - setting precise date. Now you are screwed. You will be laughingstock in just three months. Well, to be precise: more laughingstock-ey than before.

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No Problem! Memory Is Stored In The Spacetime!

Thu Feb 04 19:43:22 GMT 2010 by **Losna**

"more laughingstock-ey than before"

might well happen to you for not getting his joke"

:-)

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No Problem! Memory Is Stored In The Spacetime!

Sun Feb 07 19:18:35 GMT 2010 by **Charlie**

I dont know the source of your information,but im sure that Psychokinesis application in human will be a total chaos and failure.

Humans must attain a total perfection status before we could be able to utilize Psychokinesis efficiently.

This is not the newtons laws of motion or Brownian motion of individual particles in the fluid,telekinesis literally less understood and dangerous. We must be careful not to create a monster with little or no control.Self destruction is not SCIENCE.

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No Problem! Memory Is Stored In The Spacetime!

Wed Feb 03 15:07:29 GMT 2010 by **whiskers**

But has your comment been 'proofed'?

This is NewSCIENTIST, so whatever claims you make, be prepared to back them up with rigorous research or peer-reviewed papers. So, where are your citations for your claims?

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The Expiration Of Data's Utility

Thu Jan 28 16:10:26 GMT 2010 by **Dirk**

In the way that Native American (and other, if not all) lost cultures relied solely on oral communication and retained history through generation to generation storytelling, the advent of written and storable communication has not necessarily altered the overall purpose and

function of language. As the evolution of the internet toward a real-time web demonstrates, not all things written down are meant to be saved. The news feeds, twitter updates, and blog and profile posts that account for possibly a majority of internet bandwidth only serve a real purpose for a very short period of time after their creation, after which they pass into obscurity, even though they are technically retained. The real situation at present is that the ratio of information recorded to information consumed is so skewed that there is no need to retain a large percentage of what we record beyond that certain timeframe of utility. What has always been the case, and continues to be even now, is that the only information really 'known' is contained in the minds of the living, and that this information is constantly being refined, subject to each individuals own perspective of interpretation of data and opinion.

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The Expiration Of Data's Utility

Wed Feb 03 10:54:44 GMT 2010 by [Denise - Adelaide Australia](#)

Agreed. So what about a 'meaningful' database equivalent of the seedbank that has been collated and stored in an underice storage facility. Perhaps useful data can be captured and stored in a format that has instructions for retrieval. This can be used to re-seed the intellectual ground in a similar way to the seedbank concept. Food for thought so to speak.

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The Expiration Of Data's Utility

Fri Feb 05 03:11:45 GMT 2010 by [TK_HouTX](#)

<http://www.innocentbystander.us>

I wrote a short essay on this very topic a few months back. I do agree most information should eventually turn to dust, but, when? Technology is moving so fast that I will still be able to read the letters from my father during WWII 20 years from now, but not the information my young niece stores on her iPhone. When do we pull the plug on our personal histories?

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