

## Google boss warns of 'forgotten century'

### Level 3 • Advanced

#### 1 Warmer

Do you take photos? Where do you store them?

#### 2 Key words

Fill the gaps in the sentences with these key words from the text.

mimics	junk	vellum	digitize	artefact
defunct	scroll	routine	irony	palimpsest

1. If you \_\_\_\_\_ something, you change pictures or other information into electronic signals.
2. If something is described as \_\_\_\_\_, it does not work or exist any more.
3. \_\_\_\_\_ is old, broken or useless things.
4. \_\_\_\_\_ is an early equivalent to paper, made from the skin of a calf.
5. \_\_\_\_\_ is a strange, funny or sad situation in which things happen in the opposite way to what you expect.
6. An \_\_\_\_\_ is an object that was made a long time ago and is historically important.
7. A \_\_\_\_\_ is a long roll of paper, especially one with ancient writing on it.
8. If something is described as \_\_\_\_\_, it is usual and not done for any specific reason.
9. A \_\_\_\_\_ is a very old document that writing was removed from and the surface written on again. Sometimes the older writing on the document can still be read.
10. If something \_\_\_\_\_ something else, it behaves or works in the same way as the other thing.

#### 3 Find the information

Find the following information as quickly as possible.

1. What is 'bit rot'?
2. Where were documents routinely saved in the 1980s?
3. Who is described in the article as 'the greatest mathematician of antiquity'?
4. Which historical figure is the subject of *Team of Rivals*?
5. What does AAAS stand for?
6. What is 'Olive'?

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#### Google boss warns of 'forgotten century' with email and photos at risk

*Digital material, including key historical documents, could be lost forever because programs to view them will become defunct, says Vint Cerf*

**Ian Sample, science editor, in San Jose**  
**13 February, 2015**

- 1 Piles of digitized material – from blogs, tweets, pictures and videos to official documents such as court rulings and emails – may be lost forever because the programs needed to view them will become defunct, Google's vice-president has warned. Humanity's first steps into the digital world could be lost to future historians, Vint Cerf told the American Association for the Advancement of Science's annual meeting in San Jose, California, warning that we faced a "forgotten generation or even a forgotten century" through what he called "bit rot", where old computer files become useless junk.
- 2 Cerf called for the development of "digital vellum" to preserve old software and hardware so that out-of-date files could be recovered no matter how old they are. "When you think about the quantity of documentation from our daily lives that is captured in digital form, like our interactions by email, people's tweets and all of the world wide web, it's clear that we stand to lose an awful lot of our history," he said. "We don't want our digital lives to fade away. If we want to preserve them, we need to make sure that the digital objects we create today can still be rendered far into the future," he added.
- 3 What is 'bit rot' and is Vint Cerf right to be worried? Being able to access digital content in the coming decades could be less of an issue than one of the 'fathers of the internet' has implied. The warning highlights an irony at the heart of modern technology, where music, photos, letters and other documents are digitized in the hope of ensuring their long-term survival. But, while researchers are making progress in storing digital files for centuries, the programs and hardware needed to make sense of the files are continually falling out of use.
- 4 "We are nonchalantly throwing all of our data into what could become an information black hole without realizing it. We digitize things because we think we will preserve them but what we don't understand is that, unless we take other steps, those digital versions may not be any better, and may even be worse, than the artefacts that we digitized," Cerf says. "If there are photos you really care about, print them out."
- 5 Ancient civilizations suffered no such problems because histories written in cuneiform on baked clay tablets or rolled papyrus scrolls needed only eyes to read them. To study today's culture, future scholars would be faced with PDFs, Word documents and hundreds of other file types that can only be interpreted with dedicated software and sometimes hardware, too.
- 6 The problem is already here. In the 1980s, it was routine to save documents on floppy disks, upload *Jet Set Willy* from cassette to the ZX spectrum, slaughter aliens with a Quickfire II joystick and have Atari games cartridges in the attic. Even if the disks and cassettes are in good condition, the equipment needed to run them is now mostly found only in museums.
- 7 The rise of gaming has its own place in the story of digital culture but Cerf warns that important political and historical documents will also be lost to bit rot. In 2005, American historian Doris Kearns Goodwin wrote *Team of Rivals: the Political Genius of Abraham Lincoln*, describing how Lincoln hired those who ran against him for presidency. She went to libraries around the US, found the physical letters of the people involved and reconstructed their conversations. "In today's world, those letters would be emails and the chances of finding them will be vanishingly small one hundred years from now," said Cerf.
- 8 He concedes that historians will take steps to preserve material considered important by today's standards but argues that the significance of documents and correspondence is often not fully appreciated until hundreds of years later. Historians have learned how the greatest mathematician of antiquity considered the concept of infinity and anticipated calculus in 3BC after the Archimedes palimpsest was found hidden under the words of a Byzantine prayer book from the thirteenth century. "We've been surprised by what we've learned from objects that have been preserved purely by chance that give us insights into an earlier civilization," he said.
- 9 Researchers at Carnegie Mellon University in Pittsburgh have made headway towards a solution to bit rot, or at least a partial one. There, Mahadev Satyanarayanan takes digital snapshots of computer hard drives while they run different software programs. These can then be uploaded

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to a computer that mimics the one the software ran on. The result is a computer that can read otherwise defunct files. Under a project called Olive, the researchers have archived *Mystery House*, the original 1982 graphic adventure game for the Apple II, an early version of WordPerfect, and *Doom*, the original 1993 first person shooter game.

- 10 Inventing new technology is only half the battle, though. More difficult still could be navigating the legal permissions to copy and store software before it dies. When IT companies go out of business, or stop supporting their products, they may sell the rights on, making it a nightmarish task to get approval. "To do this properly, the rights of preservation might need to be incorporated into our thinking about things like copyright and patents and licensing. We're talking about preserving them for hundreds to thousands of years," said Cerf.

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## 4 Comprehension check

Choose the best answer according to the text.

- Why could piles of digitized material be lost forever?
  - because they have disappeared from the internet
  - because the programs needed to view the material will no longer exist
  - because new digitized formats appear every year
- What could happen if such material is indeed lost?
  - People will no longer be able to play computer games.
  - A digital black hole will be created.
  - A lot of our history will be lost.
- How did Doris Kearns Goodwin find the material for *Team of Rivals*?
  - She found important political and historical documents archived on the internet.
  - She reconstructed conversations from old letters.
  - She used material on floppy disks, cassettes and games cartridges.
- What have researchers at Carnegie Mellon University in Pittsburgh produced?
  - a program that can take digital snapshots of computer hard drives
  - a computer that can read files that would otherwise be defunct
  - a program that obtains legal permission to copy and store software before it dies

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#### 5 Find the word

Find the following words and phrases in the text.

1. a two-word phrasal verb meaning *disappear slowly* (para 2)
2. an adverb meaning *in a relaxed and unconcerned way* (para 4)
3. a noun meaning *a form of writing used in ancient times in the Middle East* (para 5)
4. a noun meaning *the room in a house under the roof* (para 6)
5. a noun meaning *a type of mathematics used for working out such things as the slope of curves* (para 8)
6. a two-word verb phrase meaning *make progress with something you are trying to achieve* (para 9)
7. a three-word phrase meaning *part of what you have to do in order to achieve something* (para 10)
8. a noun meaning *the legal right to have control over the work of a writer, artist, musician etc* (para 10)

#### 6 Verb + noun collocations

Match the verbs in the left-hand column with the nouns or noun phrases in the right-hand column to make phrases from the text.

- |              |                       |
|--------------|-----------------------|
| 1. recover   | a. long-term survival |
| 2. ensure    | b. new technology     |
| 3. run       | c. photos             |
| 4. take      | d. software programs  |
| 5. print out | e. out-of-date files  |
| 6. invent    | f. snapshots          |

#### 7 Word-building

Complete the sentences with the correct form of the word in brackets at the end of each sentence.

1. Obtaining legal permission to copy and store software will be a \_\_\_\_\_ task. [NIGHTMARE]
2. The chances of finding emails a hundred years from now will be \_\_\_\_\_ small. [VANISH]
3. Programs and hardware needed to make sense of computer files are \_\_\_\_\_ falling out of use. [CONTINUE]
4. The \_\_\_\_\_ of documents and correspondence is often only fully appreciated hundreds of years later. [SIGNIFY]
5. Archimedes is regarded as the greatest mathematician of \_\_\_\_\_. [ANTIQUE]
6. Important political and \_\_\_\_\_ documents could be lost to 'bit rot'. [HISTORY]

#### 8 Discussion

- What steps should authorities take to ensure that historical documents are not lost as a result of 'bit rot'?
- Are you worried that you might lose precious documents such as photos? Why? Why not?
- Is it better to print out photos or store them online? Why?

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#### KEY

#### 2 Key words

1. digitize
2. defunct
3. junk
4. vellum
5. irony
6. artefact
7. scroll
8. routine
9. palimpsest
10. mimics

#### 3 Find the information

1. a situation where digital content becomes useless junk
2. on floppy disks
3. Archimedes
4. Abraham Lincoln
5. the American Association for the Advancement of Science
6. a project to archive old computer programs

#### 4 Comprehension check

1. b
2. c
3. b
4. b

#### 5 Find the word

1. fade away
2. nonchalantly
3. cuneiform
4. attic
5. calculus
6. make headway
7. half the battle
8. copyright

#### 6 Verb + noun collocations

1. e
2. a
3. d
4. f
5. c
6. b

#### 7 Word-building

1. nightmarish
2. vanishingly
3. continually
4. significance
5. antiquity
6. historical