n 2003, researchers at Berkeley tried to estimate "how much information" had been produced in the previous year. (Their answer was five exabytes, claimed to be equivalent to 37,000 Libraries of Congress.) Making the estimate, the researchers struggled to distinguish newly produced from merely stored information. A new study is now contemplated and this problem will be yet more vexing. Since 2003, storage capacity has dramatically increased in volume (or, if you prefer, decreased in price). What we create we often archive simultaneously. Apple's Time Machine, for example, keeps snapshots of all your files every hour, offering a kind of time-lapse history of the development of your ideas. It can seem that every wish and whim has become eternal while ephemera and transience have lost their longterm meaning. Some of this storage is "local"; some in the "cloud", that nebulous storage space that gives us ubiquitous access to "our" information; and much in places we cannot control, such as the file servers of phone companies, Facebook, and other businesses with a large appetite for our information.

Those who have lost, dunked, dropped, or otherwise wiped their computers, or who need unanticipated access to a name, address, number, or picture, know how valuable such storage can be. Similarly, storage helps address modern concerns for "transparency" and "accountability". The Microsoft trial in the 1990s turned, in the public's eye at least, on wonderfully indiscreet email trawled

Heaven knows

PAUL DUGUID

Viktor Mayer-Schönberger

DELETE The virtue of forgetting in the digital age 256pp. Princeton University Press. £18.95 (US \$24.95) 978 0 691 13861 9

from deep storage, and recently the Bank of America has been similarly embarrassed by the discovery of board members' emails agreeing to stiff shareholders during the financial meltdown last year.

While acknowledging the public benefits, Viktor Mayer-Schönberger's perceptive Delete focuses on the personal cost of such apparently beneficial services. He offers two principal areas for worry about the unceasing retention of information, which he casts as the loss of forgetting. The first involves the threat to our privacy, which he interestingly portrays as a threat to our personal power and autonomy. The second, which he puts slightly awkwardly under the heading of "time", concerns the increasing difficulty we face in escaping our past. That problem is less widely recognized, in part because it is harder to grasp. Delete might best be read, then, as an attempt to show us all what this second issue concerns and why it matters.

To take privacy first, Mayer-Schönberger notes that stored information is prey to thieves, on the one hand, and intrusive corporations and governments, on the other. He argues that as we lose control over our data, we are losing control over our lives. Moreover, he suggests, the mere risk of having private data exposed has a "chilling" effect on our behaviour. His concern isn't simply that, for fear of consequences, we may stop posting photographs of our parties on Flikr, but that we may stop having such parties at all.

Yet we surrender such information because rewards can be high and costs often go unnoticed. Google gives us what we want out of those five exabytes of information in part because it has the goods on us and with every search learns a little more. The company's knowledge of our most secret thoughts is one reason that Google Book Search is so controversial. Here Google is assuming the role (and much of the good will) of a library. But, in the US in particular, libraries by tradition respect privacy and refuse to accumulate information about their users' reading habits. Lending records are destroyed when books are returned, even though a permanent history of our reading might help improve our library searches. Google, by contrast, gives priority to the quality of searches and so vacuums up all the personal information it can get. Its canny use of such information has given it near-monopoly of search engines (more so in Europe than in the US) and thus presents an awkward quandary for privacy advocates. We like to temper monopolies by promoting competition, but to create a viable competitor in this case, it seems, we would have to cede an equivalent amount of personal information (and control over it) to a second private corporation. Such a solution has some of the logic of dealing with one person prying into your diary by allowing somebody else do the same.

Mayer-Schönberger's account of the privacy problems that result from enduring data is useful, but his interest and novel insights lie more with his second concern, which involves the dead weight of memory. The more we cannot let go of our past, he argues, the less we will be able to build a meaningful future. He illustrates his case with Borges's unforgettable Funes and an unsettling non-fictional equivalent, "AJ", a forty-one-year-old Californian who has apparently remembered everything that has happened to her since she was eleven. As Mayer-Schönberger shows, forgetting is not as we so often think, simply a curse. It is an important way in which we release ourselves from history. If we cannot slip the traces of the past, he suggests, we will be unable to advance freely into the future.

The argument isn't an easy one to make, particularly in an account for non-specialists, where attempts to be accessible and to paint versity of Washington, somewhat in the spirit a broad picture sometimes get in the way of clear thinking. His case also gets ensnared by some over-easy comparisons. Computer memory, for example, too readily aligns with human memory while technical concepts of information elide incautiously with more demotic ones. As a consequence, the book

tends to underestimate the usefully complementary roles that physical storage and human memory play. Like Plato, Mayer-Schönberger perhaps fails to appreciate fully how writing usefully enables us to forget, allowing us to recover what we cannot recall. He would have been helped by Michael Clanchy's From Memory to Written Record (1992), which parses memory and writing where Mayer-Schö nberger tends to lump them.

Such elisions are almost unavoidable in a popular account, and Mayer-Schönberger is admirably popular, pushing well beyond mere academic hand-wringing. Indeed, raising awareness forms a critical part of the solution he offers – for unlike so many books about the internet, which like to hit the panic button then run, Mayer-Schönberger stays around to offer a solution. His is an elegant and simple solution, though as he recognizes, probably not certain. After surveying a series of technical and governmental plans, most of which have, when tried, raised more problems than they have solved, Mayer-Schönberger puts the solution in our hands. He argues that we should be forced to set term-limits for the digital information that we create. Software should include a pop-up window that asks us, as we create information, to set a date for its demise. "Our digital storage devices", he writes, "would be made to automatically delete information that has reached or exceeded its expiry date." If nothing else, this should force us to consider the implications of creating data that might last forever and live not merely beyond our control, but in such a way as to control us.

It is worth thinking about – but that may be its problem: thinking about the life of information may be as stultifying in the immediate present as not thinking about it may be in the long run. To decide whether I will ever need this file, that photograph, those recordings again after a particular date is a hard decision to make. Utility (despite what economists often tell us) cannot always be judged in the present. The value of what we keep changes depending in part on what we lose. Moreover, what we consciously chose to delete may serve to distort the past as much as what we unconsciously chose not to delete may distort the future. This is why chance survivals (like those Microsoft and Bank of America emails) can so swiftly undo those who try (as we all do) to arrange history to suit their interests. However well ordered the deliberated record may be, an unintended survivor – a forgotten piece of scrap paper folded into a ledger book, the stub of a torn-out page, the impression left on an apparently blank piece of paper, or the thumbprint on a canvas – can turn the carefully selected archive inside out.

Nonetheless, Mayer-Schönberger deserves to be applauded and Delete deserves to be read for making us aware of the timelessness of what we create and for getting us to consider what endless accumulation might portend. Even with our best intentions, it is getting worryingly hard to delete anything at all. In July, for example, computer scientists at the Uniof Mayer-Schönberger, announced "Vanish" - software that would allow messages to selfdestruct after a certain time. By September, a team from the Universities of Texas at Austin and Michigan and from Princeton announced "Unvanish", software that could restore what "Vanish" was thought to have extinguished.



The Sunday Times has launched a prestigious new annual literary prize: The Sunday Times EFG Private Bank Short Story Award. The winner will receive £25,000, which makes it the largest prize for an individual short story in the world.

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