

# Maintaining Backups of Key Files When Writing

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prepared for Essential Edits: Writing Coaches and Editors

I was reminded of the need for a guide to file backups when I (almost) lost three days' worth of work on my draft guide to thesis writing. Fortunately, my obsessive backing up has become so automatic that I still had a third backup copy when I accidentally overwrote the first two with what turned out to be a corrupted file.



## Obsessive Backups

Although everyone has learned to routinely backup any work on their computer, that routine is likely not good enough for those undertaking a sustained piece of writing, such as a book, thesis or dissertation work. For example, one of my graduate students backed up daily on two separate external drives, which he assumed sufficiently redundant, because what are the chances of all three drives failing the same day? But someone broke into his house and stole his computer *and* both external drives. He was so demoralized by the loss of all 18 month's work on his thesis, that he announced that was *it*, he gave up; he was dropping out of the program. How could he, or anyone, face a second round of thesis-writing-wretchedness,

let alone figure out how to redo the data collection? (Data sets are often one-off samples and cannot be easily redone or replaced.)

Fortunately, in my student's case he had taken my thesis-writing course, and in one class I had (amid much groaning protest and laughter) forced everyone to printout what they had so far and send it to their mothers. (A useful exercise not only because offsite storage of hardcopy can—as in this case—be one's salvation, but because sending the 2- to 20-cm pile of paper to family or colleague helps convince them one *really is* doing something when claiming to write a thesis.) He'd completely forgotten about that exercise, but since it meant he had only lost a month's worth of writing (say, 20 pages) the situation was suddenly recoverable.

So:

(1) Hit "save" with every paragraph return. Otherwise, a couple of hours can go by unnoticed when one is really concentrating, and Word's AutoSave feature won't help if the reason Word just crashed was that Word ran out of memory. Even if one recalls the general gist of what one was working on, all the fiddly bits of correct citation format, clever wording, and so on, will be gone.

[Assume any word processing software will crash more often with book-length manuscripts than the much smaller term paper or article files one has been used to working with up to now. Moving back and forth through the length of large documents—as one does to check citations or

consistency of phrasing between sections, can trigger a crash—because the software has to consume memory to keep track of where one is and where one is going. And if one is using Track Changes, rapid or repeated movement through the document essentially guarantees a crash.]

(2) Backup every couple of hours onto an external drive. Say, every time you get up to refill the coffee/tea. I have a 16gig Memorex mini-travel flash drive tucked into one of my USB ports so that it is essentially flush against my laptop. It's hardly there, but a nice safety feature for when my laptop/drive inevitably fails. [I assume this specific flash drive will be obsolete technology by the time you read this, so whatever is the equivalent in your day.]

(3) Last thing every day, backup today's files to a drive not associated with one's computer. If someone steals my laptop, my mini flash drive goes with it, and I am out a day's work, but I still have yesterday's on the hard drive at home.

If an external hard drive is not available where one finds oneself at the end of the workday, emailing today's work to oneself is an acceptable temporary measure (unless one is working with confidential data and the email is not secure).

(4) Have two additional hard drives so that one can be in use while the second is swapped out to one's home (or office, safety deposit box, mom's house, etc.). Set the rotation period to match one's personal level of paranoia, but no longer than one is prepared to have to start over from in the event of drive loss or failure. That way if one's house burns down or one accidentally overwrites backup files with a corrupted version, it is all safely saved somewhere off site.

(5) Keep a hard drive somewhere safe with *everything* from your computer (not just your thesis or book) that is six months behind what you are doing now. This non-recent backup is counter intuitive, but there has been an increasing problem with hackers encrypting one's files and demanding a bitcoin-ransom for the encryption key. Some of these criminals are smart enough to have built in a timer so it activates *after* one's last six week back up, so even if one wipes the computer and backs up from six weeks ago, the encryption is still there. Rotating out a six-month complete backup allows one to save at least some of one's thesis, and all fifteen years of family photos, without having to pay the ransom.

(6) Print out a hard copy occasionally that, if worse comes to worse, one could hire someone to retype or scan to recover. Files get corrupted; operating systems and Word processing software versions or file formats become suddenly obsolete and inaccessible; the university's system could be hijacked by encryption extortionists, and/or contaminate one's personal system; or etc.; but off site hardcopy is *relatively* (see photo below) stable.



Again, hardcopy also has the bonus morale boost of making one's progress more concrete, and therefore real, to oneself and others.

## Cloud Storage

This is sometimes a bit tricky for thesis and dissertations or controversial books. First, be aware that many cloud services are based in other countries and therefore subject to those other nation's laws, which may include the government's right to access one's files at will. Any research involving human subjects is likely subject to Human Subjects Ethics Review by one's university/faculty and/or any ethical guidelines imposed by granting agencies funding the research. One's research proposal usually needs to set out details of how one intends to keep one's data secure, including securing the anonymity and confidentiality of any respondents' data. The more personally sensitive the data, the greater the guarantees made to subjects/respondents, the more problematic storing anything on cloud services becomes. Even authors not associated with any institution still need to maintain journalist standards of confidentiality when protecting their sources. Even when the service is hosted in one's own country, the data may still be subject to court order or interference, and likely should not be considered secure.

Second, even if one's thesis or book does not include anything sensitive, one cannot rely on a single cloud service. Any company is subject to hacking, denial of service attack, or encryption attack that could compromise one's access to stored files. Further, there are numerous occasions where a cloud service has unaccountably lost or closed accounts or otherwise failed to deliver the storage one has become overly reliant upon. It's a tiny percentage, but that doesn't help if it's your account.

Similarly, problems could arise if one loses

one's password, or no longer has access to the email account associated with setting up the cloud account. For example, universities sometimes cancel graduate students' email after the student graduates or forgets to pay a semester's tuition, thus cutting the student off from the files associated with that email.

Automatic cloud backup can be helpful when not inappropriate, but should not be counted on as one's only or primary backup resource.

## Data Migration

Data storage keeps getting better, but that means it keeps changing. I wrote my dissertation in WordStar on an Osbourne 1, one of the first "portable" computers. By the time I finished my dissertation, the Osbourne company had gone bankrupt, so I bought a second used Osbourne against the day mine inevitably died, *and* I backed up all my writing and data on the university's mainframe, just to be safe. Eventually, both my Osbournes failed, and my hundreds of 5¼" floppy disks with all my data and chapters on them were useless. But I still had the copies safely backed up on the University system, because I had gone that extra step.

Or, so I thought. I hadn't been paying close enough attention because the University's system turned out to also be in the process of changing operating systems, and there was now no way to access my now obsolete files. I managed to beg one of the operators to remount my files long enough for me to download to my new personal computer, but it had been a near thing as he had had to rescue the disk they were on from the shredder.

My new pc had the latest 3½" disks, which likewise became obsolete (few of my current students have ever even seen one), but not before I had transferred everything to Zip drives. Which I backed up on three different

computers' hard drives, two of which died before the Zip drives became obsolete, but I was still able to migrate everything to my then current computer. I redundantly backed everything up on three separate external 1T hard drives to be safe...all three of which managed to fail within a month of each other, the third before I had gotten around to replacing the first two.

Similarly, my original WordStar files were translated first to Textform, then to Microsoft Word, then even my Word files became so old that current version of Word can no longer open them.

So I no longer have a digital copy of my dissertation or that research data. I do still have two hard copies: mine, and the one I gave my mom before she passed, but that's it. Which is a shame, because had I still had all the original data and notes, I could have done a pretty decent series of articles on an historical comparison of conditions then and now.

The moral, of course, is one has to pay close attention to changes in technology and ensure that one is continually migrating one's archives to current formats. Just because something is the latest hardware or software today does not mean there will be any way to read those files tomorrow. Theses, dissertations, and books can take time to complete, and form an important part of one's scholarship/backlist going forward, so one needs to ensure one's hard work does not disappear before one is done with it all.

## The 3-2-1 Backup Rule:

3 backups

2 different types of media

1 off site

## About the Author



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Other pamphlets by Dr. Runté available free from the Essential Edits website include:

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