

Paper #1—Software Risks

Due date: Wednesday, April 13

Tutorials: April 18-26 (CS 181W, last names from L-Z only)

Comments returned: Wednesday, April 27

Rewrites due: Wednesday, May 4 (CS 181W only)

For the first paper of the quarter, your task is to write a 5–7 page article describing a historical software failure other than the ones discussed in detail in the reader. Your article should be addressed to someone who has a general familiarity with science and the use of computers but who may not have any particular understanding of software. As a model, you should think of your paper as if it were a report in *Science* or a short article from *Technology Review*, *Scientific American*, or *Wired*.

In terms of content, your paper must include discussion of the following issues, although you need not limit yourself to these questions or address them in precisely this order:

- A reasonably detailed and accurate analysis describing the *technical* nature of the software failure, understandable to someone with the background you expect for your target audience. Identifying the technical reasons for a failure often requires you to consult primary sources written by technical people who are as close to the incident as possible; secondary sources—particularly newspaper accounts and web-based reports—have a tendency to gloss over technical details, often to the point that the explanation is wrong.
- A discussion of the costs of the failure, either in terms of injuries sustained, economic losses, reprogramming costs, or some other tangible measure.
- An assessment of where responsibility for the failure lies. Is it reasonable, for example, to ascribe the failure to programmer error, incorrect specifications, inadequate testing, overly ambitious requirements, unforeseeable events, or some similar cause?

Your paper must also meet the following technical requirements:

- There must be enough material about the case to write a paper that falls within the length guidelines. The page count (5–7) refers to the *manuscript copy*, which assumes a double-spaced paper set in Times New Roman 12 with the default margins in Microsoft Word® (1.25" on the sides, 1" at the top and bottom). If you feel that your topic forces you to stretch these limits, please get approval from your TA first. You are, however, also encouraged to submit a separate *camera-ready copy*, which should be formatted exactly as you would like it to appear in the magazine, complete with figures, sidebars, section headings, and anything else you think would make it more engaging and understandable to the reader.
- You must include a list of references that includes at least three sources. For example, you might use material from books, a newspaper account, and an electronic newsgroup

report. If you feel that a formal reference list seems out of place in your camera-ready copy, you can present them as a sidebar entitled “Suggestions for further reading” or something of the sort.

- Your sources must include at least one source that was originally electronic and at least one source that was in print, at least at some point in time (you can, for example, use a web version of a *New York Times* article, since it did appear in print). One of the most important online sources is the `comp.risks` forum moderated by Peter Neumann. You can read `comp.risks` on the web at <http://catless.ncl.ac.uk/Risks>. You will also find a wealth of information about computing failures at various other sites on the web.

Finding a topic

Several software failures that might make useful topics are mentioned in the assigned reading. The best source is Peter Neumann’s amazingly comprehensive “Illustrative risks to the public in the use of computer systems and related technology,” which is available on the web at <http://www.csl.sri.com/users/neumann/illustrative.html>. In recent years, there have also been several books published in this area; Peter Neumann, for example, has a book entitled *Computer Related Risks* (Addison-Wesley, 1995). In addition, many textbooks covering the topic “computers and society” (as opposed to “computers and ethics”) have longer sections in this area.

Besides books, there are also conference proceedings, journals, and periodical indices that may prove useful. Since 1987, Computer Professionals for Social Responsibility has sponsored ten conferences on the Directions and Implications of Advanced Computing. I have these proceedings in my office. Among technical journals, the best source is *Software Engineering Notes*, which is published by the ACM special-interest group on software engineering (SIGSOFT). Copies of *Software Engineering Notes* are available in the library.

Online searches using Google or Socrates may be helpful in finding published sources, although you have to find a way to make your searches manageable. Searching for **COMPUTER RISKS** on Google, for example, generates more than 42 million hits.

Submission and evaluation procedure

You should submit your paper—the manuscript copy and the optional camera-ready copy as described earlier in this handout—electronically (details will be posted on CourseWork and the web site) before 11:59 P.M. on Wednesday, April 13. Anything that comes in after midnight will be considered late.

If you are taking CS 181W, you also need to rewrite the paper based on your TAs comments and must have one of your two papers evaluated by the writing tutors in the Technical Writing Program (TWP). As I noted on the first day, the number of people in the class makes it impossible to schedule tutorials for both papers. What we have therefore decided to do is divide CS 181W roughly in half and run tutorials on either the first or second paper. I have randomly assigned those whose last names begin with L-Z to the first group and those in the A-K range to the second. Thus, if your last name

begins in the latter part of the alphabet, you will need to arrange a tutorial for this paper with TWP. Claude Reichert, the director of TWP will be here at the beginning of class on Wednesday to talk a bit more about the process, but you should be able to get the information you need from the web site.

All papers will be read and returned by Wednesday, April 27. If you are taking CS 181W (no matter what letter your name begins with), you will need to submit a rewrite based on your TAs feedback (and that of the writing tutor, if you have a tutorial for this paper).

Suggestions on style

Remember that you are writing this analysis as if it were an article in a magazine like *Science*, *Technology Review*, *Scientific American*, or *Wired* and not simply as a paper. Given that you are writing for a particular venue, it is a good idea to look at those sources and see how they present material in a way that makes it easy to understand. Headings, sidebars, and diagrams—which you would not necessarily think to include in an academic paper—are very helpful in this type of writing. It's also very important to keep your intended audience in mind. The readers of your article may not know much about software and how it might fail. You must address those readers as your audience rather than the course staff.