

Y2K: An “Autopsy” of Modern Society?

The Policy Forum “The Y2K Problem” by Robert F. Bennett (*Science’s* Compass, 16 Apr., p. 438), was an excellent follow up to the special issue of *Science* on Complex Systems (2 April). Within the next 12 months we shall learn just how interconnected and interdependent the institutions of contemporary societies have become.

Consider the fact that a major manufacturing firm such as General Motors has thousands of suppliers. Each of the companies supplying parts or services to GM also has suppliers. And those suppliers in turn have suppliers. Suppose that GM is completely year 2000 compliant and the majority of its suppliers are as well. But, for whatever reason, GM cannot obtain 5% of the parts needed to build automobiles. What will GM do? They will have to stop building cars. And all of the compliant companies shipping parts to GM will lose an important customer.

In terms of complexity theory an interesting question is, What fraction of the companies in an interconnected society need to fail in order to cause the failure of nearly all of the organizations in the society? The Gartner Group has estimated that in many countries around the world 50% or more of the companies in the country will have at least one mission-critical system failure. These countries include Russia, China, India, Indonesia, Japan, Germany, Turkey, Saudi Arabia, South Africa, Venezuela, and Argentina (gartner5.gartnerweb.com/public/static/aboutgg/pressrel/testimony1098.html). That is a lot of countries, a lot of people, and a lot of supplies shipped to the United States.

Also, according to the Gartner Group the countries most prepared for dealing with the year-2000 computer crisis include the United States, the United Kingdom, Canada, Australia, and the Netherlands. In these countries 15% of companies are expected to have at least one mission-critical system failure. Which societies will be least affected or will recover most quickly – less developed societies with less dependence on computers and automated equipment or advanced societies that have been working hard to repair date-sensitive equipment?

Another “complexity” issue involves the many chemical plants, refineries, nuclear reactors, and pipelines we have constructed. All facilities that handle hazardous materials are designed with back up systems. How many programmed logic controllers within these facilities need to fail in order to cause a spill? Will some societies shut down their dangerous equipment and others not?

It seems that we are about to witness an “autopsy” of modern society. As one system or company fails, we shall learn what other systems, companies, and countries depend on it. The year ahead will present unique opportunities for education, research, and public service, as we help the public understand what we are experiencing.

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