Testing On-line Voting

BY STEVEN M. CHERRY
Managing Editor, IEEE Spectrum Online

After an election marred by court cases alleging voter fraud due to poor voting and vote-counting systems, George W. Bush was sworn in on 20 January as the 43rd President of the United States. From a technology standpoint, most of the voting difficulties were prompted by computer-based optical scanning systems used to count ballots and, to a lesser extent, by the user interface of the ballot itself. Nonetheless, the resulting chaos generated calls from U.S. voters for a move to electronic ballots—voting by, say, a touch screen, rather than a punched card—and even to Internet-based systems, a move that several observers warn might lead to less, rather than more, accurate elections [see “The Pipe Dream of Internet Voting,” p. 14].

Given the inadequacy of current voting methods, there seems little alternative but to upgrade the systems. Voters in New York City, for example, may have considered themselves lucky to be using voting machines with metal levers, instead of punched cards. Most, though, probably do not realize that the machines have 27,000 individual parts and are no longer being manufactured.

Electronic voting systems were among the year 2000’s more interesting technology stories. Last February, VoteHere Inc., of Bellevue, Wash., ran several demonstrations of on-line voting, including one in its home county of Thurston. The demo was considered a success, according to a report by its election manager, Kimberley Wyman (available at http://www.co.thurston.wa.us/auditor1/).

More controversially, in March, the Arizona Democratic presidential primary had voters using the Internet to register their votes at terminals set up in polling sites around the county. The election was run by Election.com Inc., of Garden City, N.Y.

Critics have not been shy in pointing out that these demonstrations have highlighted difficulties in trusting the current state of electronic voting technology. A report, “Is Internet Voting Safe?,” issued in July 2000 by the Voting Integrity Project, a nonprofit organization in Washington, D.C. (http://www.votingintegrity.org/text/2000/internetsafe.shtml), is particularly critical of the Arizona primary election, claiming that with Internet voting there are no physical records to fall back on in disputed elections, that no proof of network security has been offered, and that elections could be undermined by intentional or unintentional computer viruses.

Computer security expert Peter Neumann, of SRI International, Menlo Park, Calif., has seen several skeptical looks at the security of on-line voting. In a January article (see “System Integrity Revisited,” Communications of the ACM, January 2001, p. 160), Neumann and coauthor Rebecca Mercuri discuss the need for voting system accuracy of at most one error in a million votes and the difficulty of designing a satisfactory user interface. They also examine the ease of tampering with on-line votes and the inherent auditing difficulties (http://www.csl.sri.com/neumann/insiderisks.html).

In “Sanity in the Election Process” (http://www.vortex.com/privacy/priv09.24), Neumann, with coauthor Lauren Weinstein, look at problems with existing voter technology. The authors point out that “all voting systems are subject to some degree of error.” In fact, they argue, manual recounts can provide the most reliable mechanism for counteracting these limitations, and they conclude that manual recounts, court cases, and re-voting should be understood as part of the overall election process. They acknowledge that close elections will therefore be “slow, and potentially expensive,” but suggest that manual recounting is “the only fair course.”

Embracing the delays that Neumann and Weinstein see as a necessary evil is Salon.com columnist Ellen Ullman. In her Web article “Hurrah for slow recounts” (http://www.salon.com/tech/feature/2000/11/08/online_voting/index.html), she mocks the fans of Internet voting (“Click here for the leader of the free world”) and seems charmed by the thought that it’s still possible to wake up “to find we still don’t know who’ll be the next president of the United States.”

Ullman also focuses on the user interface of voting systems. She notes that voting is currently done in “rec rooms and church basements and garages” and describes voting as a “public, civic ritual.” Also, she asks: “What sort of physical representation do we want to give to this most central act of citizenship?” and mourns the potential loss of physical ballots in favor of a browser window, a Web form, and “the inevitable button at the bottom which everyone has somehow decided should be labeled Submit.”