Norway has 4.3 mill. inhabitants, and elects 165 Members of Parliament (MPs) every 4th year. There are in all 19 county constituencies. The largest, the city of Oslo, directly elects 15 MPs. The last parliamentary election took place on Monday Sept. 13, 1993. Oslo then had 360,000 voters over 18 years, with a turn-out of 77.3%.

In this election, Oslo attempted to use a computerized system to manage the voter register (“mannallskontroll”). The system should keep track of electorate composition and participation – but not which party was voted for. The voter register system had been developed since 1988 by the government’s computing center (SDS), on contract from the city of Oslo. The system had one central electorate register on a Bull mainframe, connected to 188 PCs serving as terminals. 91 municipal schools were used for the election, with the school PCs drafted as computing resource. The system had been tried out successfully on a small scale at the municipal election in Oslo in 1991. It had not, it turned out later, been exposed to realistic testing.

In anticipation of all this, the city reduced the number of employees on election day from 967 to 767. However, the system developed severe “breathing” problems only 1/2 hour after the election started at 09:00. The reason was an error in the local X.25-based communication controllers, using character-based instead of line-based transmission protocols. The trouble seemed to come from a wrong setting of X.3/X.29 PAD parameter 3, “Selection of data forwarding character”. It is not yet clear who commissioned the PAD setting, at what time, for what purpose, and under which control and testing scheme.

The error was corrected at 14:00 on election day, but then the municipal election committee had already decided to revert to manual backup procedures. Indeed, a group of specially invited, international observers from more “low-tech” countries was very impressed by the city’s ability for manual improvisation.

In the ensuing chaos, there were some irregularities: 1200 more ballots than registered votes (crossed off, but “lost” in the computer) and 700 “lost” ballots from one specific voting station (school). In addition comes 1948 rejected ballots (blank, empty etc.), being roughly the same as for the elections in 1985 and 1989.

The municipal election committee in Oslo unanimously decided that “... The material has, however, so many errors, that it is difficult without reservation to be able to recommend it as accepted”. This would have implied a re-election 2–3 months later. This recommendation was turned down by the newly elected Parliament with a 119 against 27 vote, during its own constitution process on Oct. 8, 1993. The reasoning was that the acknowledged election irregularities in Oslo were judged to be insignificant for both the municipal and the national election outcomes. On the other hand, a re-election would very likely have caused changes among the elected MPs.

The ballot cards in Oslo were counted optically, after all the votes had been cast. The ballot cards had the size of a classic punched card, and were equipped with a printed bar code. The corresponding computerized system (also from SDS) with 20 counting machines worked OK.

The city of Bergen (the second largest city) successfully used a similar system, but with local register copies in the school PCs, rather than mainframe communication. This was costly, however, because the Norwegian Data Inspectorate insisted that all the PC hard-disks be replaced after the election, so that no copies or shadow disk images of the register could escape. It is basic to Norwegian election laws that no one shall know who voted.

Afterword:

Many countries (USA, Belgium, India) are using electronic voting systems. The Norwegian Government proposed last year that a wholly computerized voting system, with Direct Recording Equipment and no paper ballots, could be tested in the 1993 election. This was rejected by the Parliament. An account of the expectations of the project leader for the Oslo election, can be found in the “New Scientist” of Sept. 11, 1993 (Vol. 139, No. 1890). One of the highlights is the following quote: “An election with only electronic voting can be much more secure and correct than a paper-based one. But we feel the (Parliamentary) committee did not have the necessary knowledge to trust such an advance in the use of technology.” Electronic voting still awaits parliamentary approval ...

The two authors essentially consider the Oslo election a success, in the sense that it demonstrates wonderfully the necessity of a system of control routines outside of the computer voting equipment. In particular that some form of manually controllable paper ballots be available. All other forms of control have to be based on computer trust, and on total trust of the computer specialists involved.

As someone wrote in an Oslo newspaper (Arbeiderbladet, Sept. 28): “Casting one’s vote is as close to a sacred act as one can get in a modern democratic secular society. The high-priests of modern technology should be kept at arms length from the more sensitive parts of that act.”