The Trials and Tribulations of Electronic Voting

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(ACCURATE)

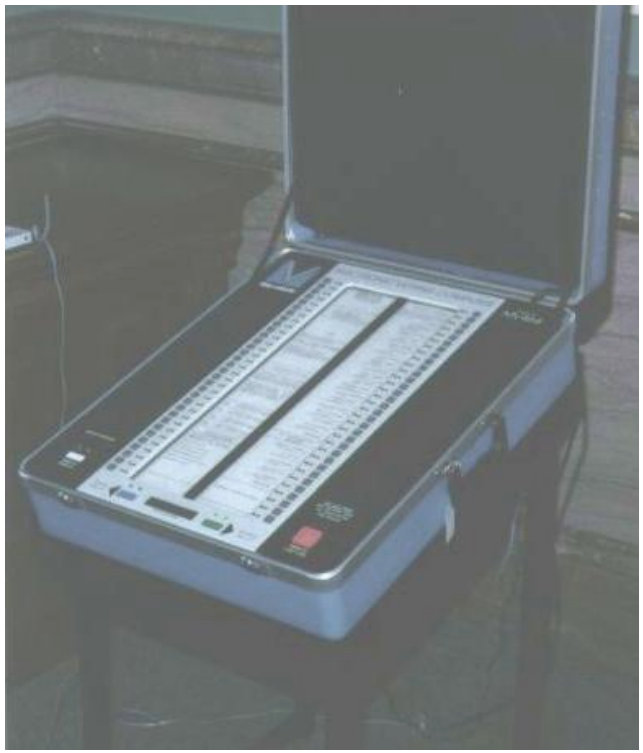
What is E-voting?

Voting using any electronic mechanism.

Not just touch screen voting machines

Machine-counted paper ballots are a kind of e-voting

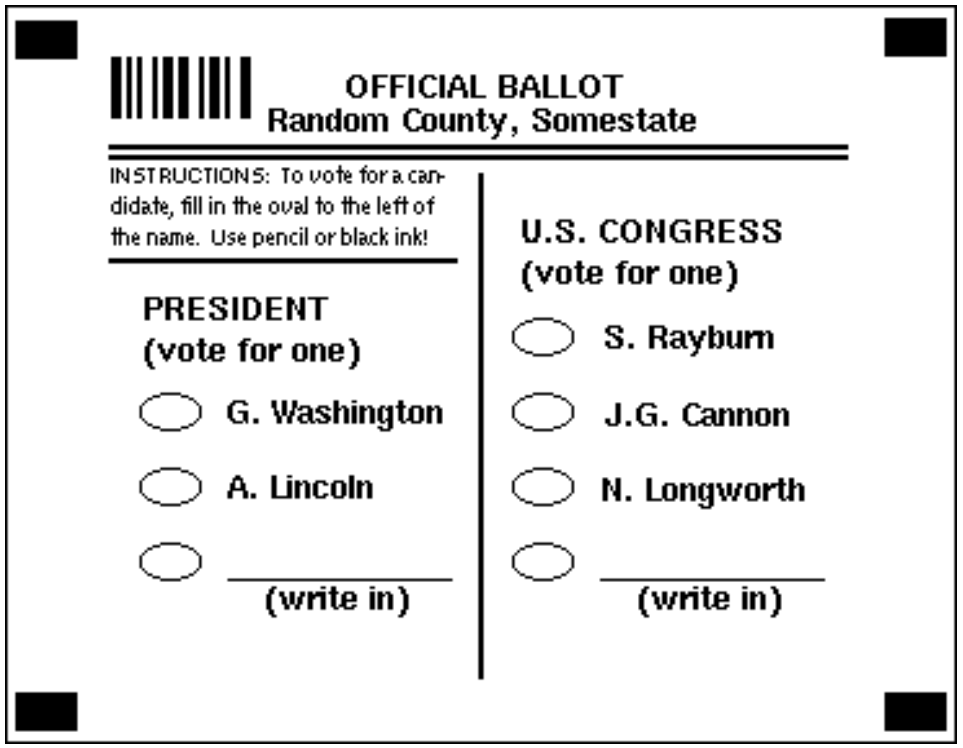
Even punched cards!



Scanned Paper Ballots

Oldest type of E-voting, emerged in the 1960s.

- Punched Cards
- Optical Mark-Sense Ballots

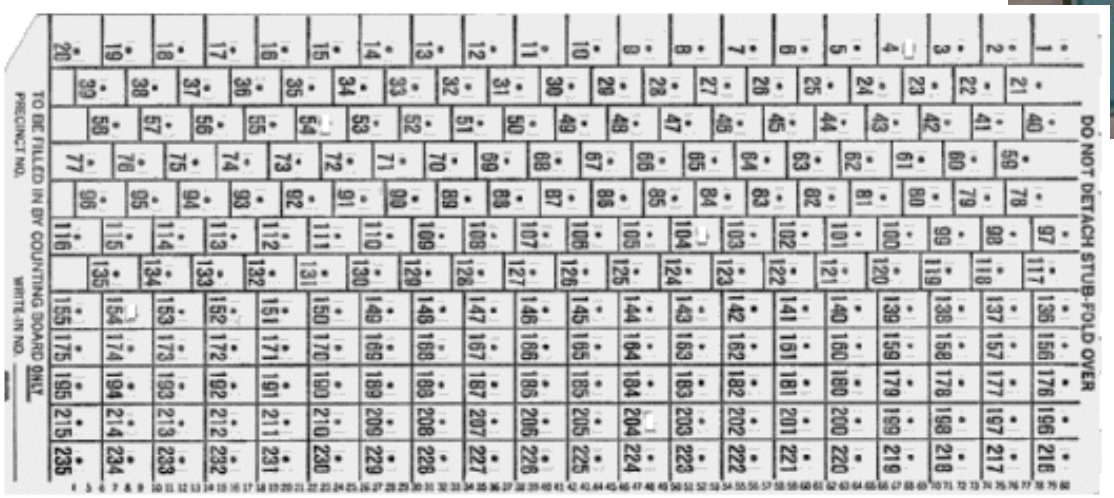


Advantage: Voter verification
Disadvantage: Voter mistakes

Punched-Card Ballots

Voter Verification Failure

It is possible for voters to check their ballots



but so hard that few did

Central-Count Mark-Sense

Widely used for absentee voting
Ballots subject to handling by many people

No second chance!

- If you mismark a ballot, it may be ignored.

4% miscount rate in some counties, depending on ballot design and handling.

Precinct-Count Mark-Sense

Ballot counted immediately on deposit in ballot box. Emerged in 1970's.

Ballot returned to voter
- on overvote
- if scans as blank

Miscount rate around ½% (instructions and ballot layout have major impact)

Direct-Recording Electronic

The newest E-voting technology emerged in 1970s to 1990s

Push-button voting machines
Touch-screen voting machines
Dial-a-vote mechanisms

A serious attempt at handicapped accessibility.

Miscount rate around 1%

Elections are hard because:

Two requirements conflict:

- Secret ballot
  You can't disclose and nobody can see your vote.
- Transparency
  You can be sure all votes were counted correctly.

AND

Elections are run by temps –
  2 election workers per 100 voters, on average.

Loss of Transparency

The central problem with E-voting

With hand-counted paper ballots, *voters* and *candidates* could observe and know what it was they were seeing.

With computers, *even experts* cannot tell what is going on.

What does this photo show?

Vulnerability of E-Voting

- *Analysis of an Electronic Voting System*
  Kohno, Stubblefield, Rubin & Wallach,July 2003
- *Risk Assessment Report, Diebold AccuVote-TS*
  Science Applications Int'l Corp., September 2003
- *DRE Technical Security Assessment Report*
  Compuware Corporation, November 2003
- *Trusted Agent Report, Diebold AccuVote-TS*
  RABA Technologies LLC, January 2004

Vulnerability of E-Voting

- *Security Analysis of … Diebold AccuBasic …*
  Wagner, Jefferson, Bishop, February 2006
- *Diebold TSx Evaluation – Security Alert*
  Harri Hursti, May 2006
- *Security Analysis of … Diebold AccuVote-TS …*
  Feldman, Halderman & Felton, September 2006
- *Nedap/Groenendaal ES3B … a security analysis*
  Gonggrijp & Hengeveld, October, 2006

Voting System Certification

- Independent Testing Lab Certifies voting system to Federal Standards
- Standards set by
  - Federal Election Commission, 1990
  - Federal Election Commission, 2002
  - Election Assistance Commission, 2005
- States may set additional standards
  - New York's new standards look good, on paper
  - Many states consider Federal standards enough

Regulatory Capture

"Gamekeeper turns poacher or, at least, helps poacher." [The Economist]

Richard Posner of the University of Chicago argued that "REGULATION is not about the public interest at all, but is a process, by which interest groups seek to promote their private interest ... Over time, regulatory agencies come to be dominated by the industries regulated."

Voting system vendors are clearly playing this game

Election Official Buy-In

- Once you spend public money on something,
  You cannot afford to be wrong.
- If you are tied to a single source for a decade,
  You will avoid asking hard questions.
- Public confidence in elections is very important,
  So by all means, keep all criticism private.

The result? Election officials are predisposed to:

- Believe what the vendors tell them.
- Discount what critics have to say.

Winning Back Some Transparency

Voter Verified Paper Ballots

- Punched cards demonstrated verification failure
- Precinct-count optical mark sense work well
- An idea:

Equip DRE machines with printers, so that voters can verify that their selections have been properly recorded to paper.

- Required, to varying extents, in Nevada, Colorado, Minnesota, New York, and several other states.

The Importance of Hand Recounts

- If recounts are always done by machine
  A recount cannot discover machine failures
- Therefore some recounts must be done by hand
  A reasonable rule [from Ohio]:
    Count 3 percent, at random, by hand,
    if this finds no discrepancies,
    count the rest by machine.
- Without hand recounts,
  paper ballots are no better than DRE

The Importance of Auditing

- If you only recount controversial or close elections
  You will not catch the most competent thieves
  You will miss many careless errors

- Therefore, do routine recounts of random precincts
  A reasonable rule [from California]:
    After each election, pick random precincts
    until you have 1 percent of the ballots, then
    do hand recounts in those precincts.

The Help America Vote Act of 2002

- Proposed in early 2001
- Died in Committee (we all thought)
- Passed very quickly, fall 2002

Why did it pass?

The August 2002 primary in Florida.

New E-voting systems replaced punched cards
Change was done to avoid a repeat of 2000
Change was planned very badly!

Good things about HAVA

- Eliminated punched cards
- Eliminated mechanical voting machines
- Restrict central-count scanning to absentee ballots
- Created emphasis on handicapped accessibility

Bad things about HAVA

- Created Byzantine administrative structure
  Dominated by elected officials (NASED, NASS)
  Very little requirement of technical competence
  Charged with overseeing voting system standards
- Spend millions of dollars on new voting systems
  Before any new standards could be set
- Badly underfunded and Seriously delayed
  Except for purchase of new machines
- Forced massive upheaval in voting system market

This Fall, I expect:

More of the same:

- Widespread patterns of clerical errors
- Scattered fraud, mostly in local political machines

With problems compounded because

- 30 percent of the country will be voting on unfamiliar machines in the same election.
- Many jurisdictions will be using mixed systems to meet accessibility requirements of HAVA.

Emergency Paper Ballots

Voting Systems can break.

What do you do when this happens?

Iowa Code 721-22.431(52)

Temporary use of printed ballots in voting machine precincts.

Sets a model for the nation. Other states would be well advised to adopt our rules in this area.