



Trusting the Vote

Ben Adida

`ben@mit.edu` - <http://ben.adida.net>

Cryptography and Information Security Group

MIT Computer Science and Artificial Intelligence Lab

10 December 2004



Trusting the Vote

*“The people have spoken....
the bastards!”*

-Dick Tuck,
1966 California State Senate Concession Speech

Why is Voting so Difficult?

- Stakes are high
 - Presidency of a large nation
 - Budgets in the \$100M
- Problems are not easily detected
 - Incomplete audit, by design!
- Experts vs. Electorate
 - New technology vs. Public audit

Helicopter Crash Delays Afghan Vote Count

Helicopter Sent to Pick Up Afghan Ballots in Remote
Province Crash-Lands, Delaying Vote Count

Absentee ballots 'lost' in Florida

October 28, 2004 09:28 IST

Nearly 58,000 absentee ballots for the US presidential election may never have reached Florida's Broward County voters, who had requested them more than two weeks ago, election officials said.

Scavenged **ballot box** lids haunt S.F. elections

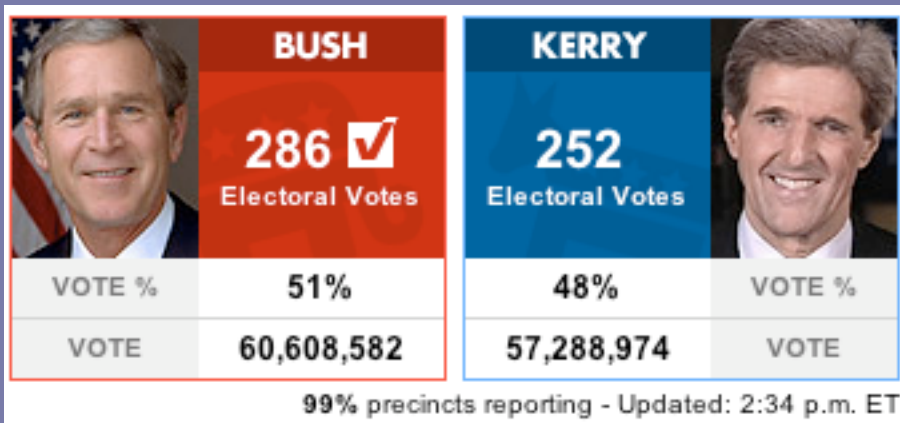
[Erin McCormick, Chronicle Staff Writer](#)

Monday, January 7, 2002

The Secret Ballot

- “Australian” Ballot
 - Australia in 1850s
 - UK in 1870s
 - US in 1888-1892: Grover Cleveland
- Critical for trust: prevents coercion
- Source of most complexity!

Voting Integrity



Polling Station Voting

- Cast as Intended?
Butterfly Ballots in Florida
- Recorded as Cast?
No Voter-Verifiable Audit Trail
- Tallied as Recorded?
Equipment Audit and Certification

Internet Voting

- Cast as Intended?

Viruses

- Recorded as Cast?

Trusted Platform / Voter Verification

- Tallied as Recorded?

Protocol Review and Auditing

- What about Coercion?

Absentee Voting

Coercion problem is the same
as Internet Voting

Cryptography & Universal Verifiability

Every step is observable.

Trust shifts from election officials to
cryptographers.

So...?

- Voting is Difficult - Secret Ballot
- Transparency is Key
- Universal Verifiability is Possible
- Voting is not Commerce