The Brazilian Electronic Voting System: evolution and challenges

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Approach

- Context
- Criticism
- Internal View
- Crossing Perceptions
- Final Remarks
Context – State X

São Paulo - more than 45 million of people
Electoral Court of State X (1 of 27) – close to Belgium population
9 million electoral voter records
Context - Before Electronic Voting

• Before 1996
  • 10% illiterate people (Brazil)
  • Writing names or numbers
  • Ballot Sheets
  • Ballot box
  • A great number of parties
  • Hundreds of candidates for each political position
  • Vote at the candidate
  • Delays in reporting results
  • Possibility of fraud (Rio de Janeiro and Alagoas -1994)
Context - Electronic Voting

1995 - 1996

• The answer – electronic voting system
• 1995 – Committee in charge of creating the electronic voting system concept
• Conclusions: The equipment should:
  • Be easy to: install, operate by the voter and the poll workers
  • Robust and low cost
  • Have its own energy source and no network connection (standalone)
  • Interface by numbers
Internal view – Challenges (GD)

• Mandatory choices
  • 5 choices between more than 1,000 candidate’s numbers (2014) –
  • president (8),
  • governor (8), senator (8),
  • Federal Deputy (328) and
  • State Deputy (731)
Internal View – Logistic (EC)

Electoral Court of State X
+ 170 Electoral offices
30,000 electronic ballot boxes – 25,000 poll stations
400 employees + 900 temporary workers
Training, testing (hardware, software, proceedings)
20,000 machines delivered in 6 hours to 7,200 polling stations
25,000 machines collected in 5 hours on a 250,000 km² area
Criticism

- Lack of auditability - Transparency
- Secrecy of the vote - Security
- Costs
- Market driven approach (Technology) versus social-driven approach
- Focus on external attacks/ risks of internal attacks
- Cryptography
Internal View – Security issues (CIO)

• Focus on external attacks / neglect internal attacks – ballot box architecture and software signed by a set of keys (transparency)
• One Cryptographic key for all electronic ballot boxes (contingency)
• Electronic voting development without user participation (public audiences about printed vote)
• Data modification during the transmission
• Lack of transparency and source code verification (98% to 2%)
• Secrecy of vote – it shuffles the votes and doesn’t record the order
• Biometric voter registration
• Fraud proof – No proof from 1996 to today.
Crossing Perceptions

• Security – GD, EC and CIO – “there was not a single case of proven fraud regarding the electronic ballot box (GD)”

• Transparency -
  • GD recognizes the problem (“the level is improving”)
    • Printed vote (“a printed vote does not increase security”)
  • CIO – Advocates more transparency opening 98% of the software to the community
    • Printed vote is mandatory
  • EC - printed vote is necessary, but in sampling terms
Crossing Perceptions

• Costs
  • All the deponents consider the system expensive
  • CIO – election without frauds – “a social good for the country”
  • EC
    • hardware maintenance
    • Logistic
    • Human Resources

• Vote online
  • GD - More security resources
  • EC – voter identification
  • CIO – secrecy of the vote
  • Inside certain or the farmer slums or poor farm areas, the mafia can force people to vote for a certain candidate or even use their voter registry and vote for them
Concluding Remarks

Transparency - ways to improved it
The ordinary citizen doesn’t understand how the system works – campaing to explain it
Disclose the proceedings against internal attachs
Open the software sources code (98%)
Printed vote – auditability and higher costs

Costs – search for lower costs

Online voting is incompatible with Brazilian reality
Thank you very much!

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