



University of Twente

Acceptance of voting technology:
between confidence and trust



University of Twente
The Netherlands

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My background

- Masters computer science & philosophy of science, technology and society (Twente)
- 2003-2007 PhD candidate, Security of Systems group (Nijmegen), thesis on e-voting
- 2007-2008 policy officer Ministry of the Interior, e-voting and travel documents
- 2008- postdoc information security (Twente)



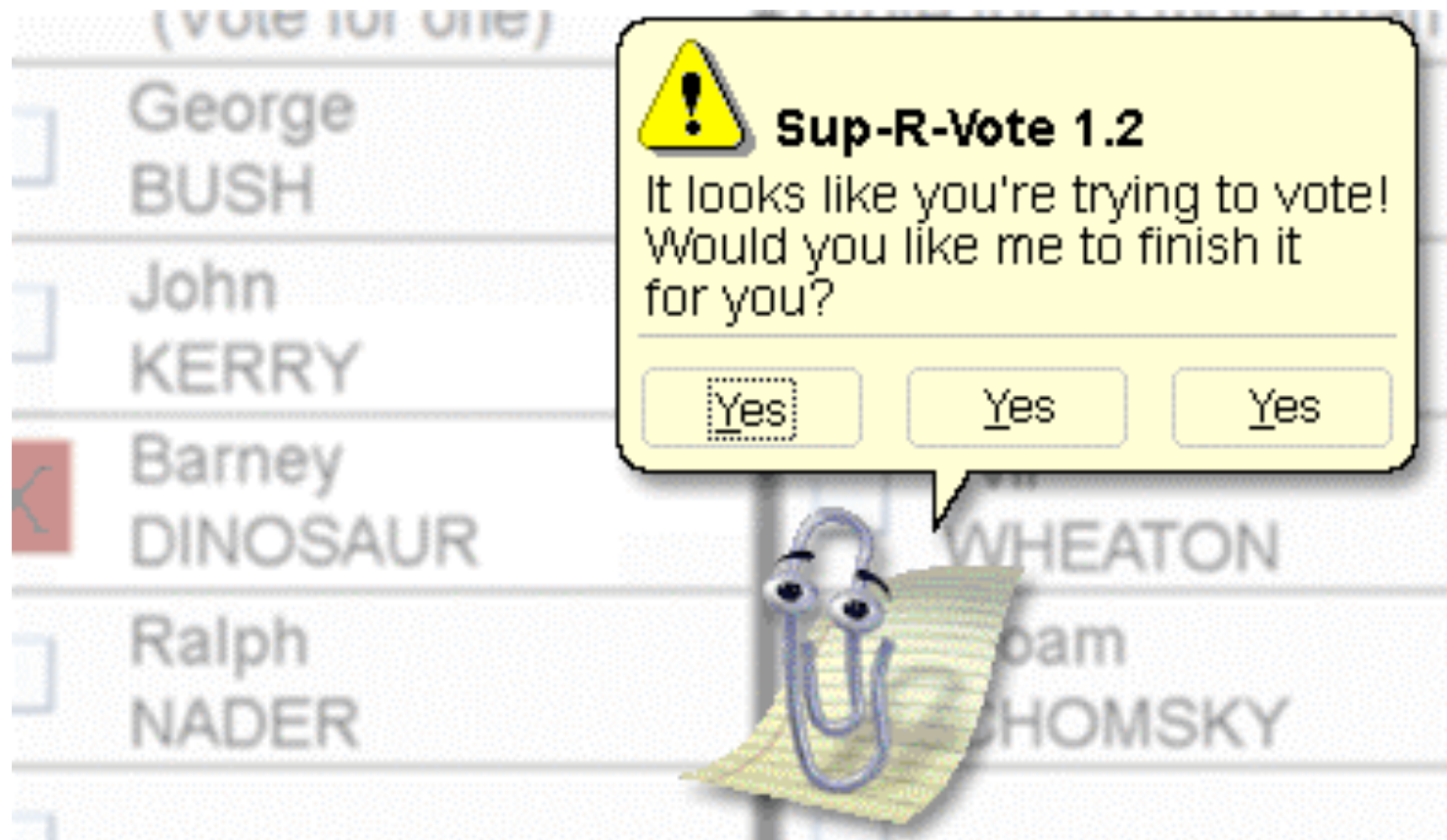
The e-voting debate in the Netherlands, 1990



Nedap voting machine



The e-voting debate in the Netherlands, 2007





The e-voting debate in the Netherlands

Questions:

- How did the Dutch e-voting lose its trust?
- Too much trust in the first place?



The e-voting debate in the Netherlands

My thesis:

- Due to the pressure group Wij Vertrouwen Stemcomputers Niet, e-voting is now seen as really *different* from paper voting
- Therefore, voting is now required to have *trust* rather than *confidence* only: a *decision* must be made by *comparing* the alternatives
- This *by itself* makes paper voting more attractive



Confidence and trust

physical record of their vote and deposit it in a secure ballot box, voter trust in DRE equipment depends on trusting the voting machine hardware and software in combination with the people and procedures designed to safeguard it.

Increasing trust

Several mechanisms have been proposed to provide voters with increased confidence that their vote is cast as in-

on trust in those companies' integrity and expertise.

Voter-verifiable ballots

One way to decrease the trust voters must place in voting machine software is to let voters physically verify that their intent is recorded correctly. Rebecca Mercuri has proposed a method for voter-verifiable ballots. After a voter has finished making selections using a DRE machine, the machine prints out a paper ballot that contains the voter's selections for each choice. The printed ballot is

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US. Douglas JONES offers a helpful voting-system history in "A Brief Illustrated History of Voting" available at www.cs.uiowa.edu/~jones/voting/pictures/.

Recent cryptographic voting schemes, such as David Chaum's,¹ VoteHere (www.votehere.com), and Prêt à Voter^{2,3} provide strong security and privacy guarantees, high levels of transparency, and require only a minimum amount of public trust in voting devices or voting officials. In these schemes, *voter verifiability* assures accuracy and preserves ballot secrecy by allowing voters to verify that their votes are accurately counted. However, a full appreciation of such cryptographic voting schemes—on which an entire election's validity would depend—requires a high degree of mathematical sophistication; experts' evaluations and assurances might not be enough to persuade the public to put their trust in such schemes.

Our ultimate goal is an e-voting system that isn't only completely *trustworthy*—doesn't lose, add, or alter ballots, for example, or violate ballot secrecy⁴—but is also *trusted* by voters to have these properties. As a step toward this goal, we have aimed to develop voting systems that provide transparency, security, and accuracy.

Wait a minute... do we wish to *minimise* or *maximise* trust?



Confidence and trust

According to Niklas Luhmann, there are two modes of self-assurance relations: *confidence* and *trust*

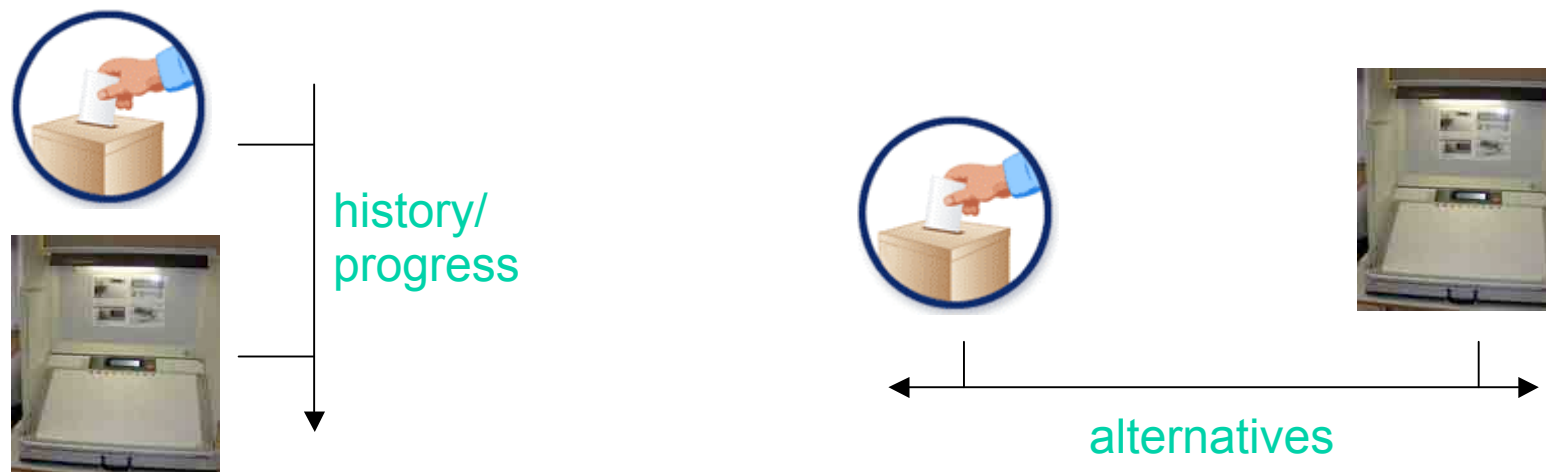
	confidence	trust
type of reliance	unconscious	conscious
interpretation	no perceived alternatives	comparison of alternatives
action	no decision	decision/choice
what scientists want	minimise	maximise





Explanation of the e-voting debate in NL

- E-voting was never seen as a real *alternative* to paper voting, so that trust was not required
- The pressure group Wij Vertrouwen Stemcomputers Niet made e-voting an alternative, by explicitly drawing the distinction





Explanation of the e-voting debate in NL

- Comparing the alternatives required trust instead of confidence only
- Paper voting is less easy to use (confidence), but easier to understand and analyse (trust)
- *The fact that e-voting is now seen as an alternative by itself makes paper voting more attractive*



More information

- Wolter Pieters. Acceptance of voting technology: between confidence and trust. In: K. Stoelen, W.H. Winsborough, F. Martinelli and F. Massacci (Eds.), *Trust Management: 4th International Conference (iTrust 2006), Proceedings*, LNCS 3986, Springer, 2006, pp. 283-297.
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How Dutch e-voting lost its trust:

- Due to the pressure group Wij Vertrouwen Stemcomputers Niet, e-voting is now seen as really *different* from paper voting
- *Confidence* occurs when something is accepted without comparison; *trust* follows from comparison of and decision between alternatives
- Therefore, voting now demands *trust* rather than *confidence* only
- This *by itself* makes paper voting more attractive, because easier to understand and analyse

