

Privacy en Beveiliging

Assignment 3

Martijn Warnier
Vrije Universiteit, Amsterdam

FEW/Computer Systems,
Vrije Universiteit, Amsterdam.

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This is a hand-in exercise. All hand-in exercises together count for 30% of your final grade. This is the last hand-in exercises, each makes up 10% of your final grade. The hand-in exercise can be written either in Dutch or in English.

This exercise deals with '**Electronic Voting**'. Voting is very difficult to automate, mainly due to the conditions to which a good election must adhere:

1. All votes must be represented correctly in the end result of an election.
2. Only eligible voters may vote, e.g. persons older than 18 years of age on the day of the election.
3. Each eligible voter has at most one vote.
4. The voting procedure must be transparent.
5. Votes must be anonymous.
6. Voters have no way of proving for whom they have voted during or after their vote has been cast.

The last two rules prevent eligible voters from selling their vote, or being coerced.

Answer the following questions. Please read *all* questions carefully before answering them.

1. Does traditional voting with 'pen and paper' fulfill all the conditions listed above? You may assume (1) that votes are cast in polling booths in publicly accessible polling stations, (2) that voters must prove their identity before being given a ballot, (3) that voters deposit their own ballots in sealed ballot boxes (4) and that ballot boxes are opened at a predetermined hour, after polling has ended, in the presence of neutral (international) observers. Explain your answer.

2. In recent years there have been some problems with the reliability of (closed source) electronic voting machines. Most notably, electronic interference has shown to be an effective measure for analysing voting behaviour at a distance. Assuming that this particular problem can be solved (e.g. by placing polling booths inside lead walls) and that the voting procedure is comparable to the procedure described above for 'pen and paper', does voting using electronic voting machines meet the conditions listed above? Motivate your answer.
 - (a) Would a 'paper trail' help? (i.e., voting machines not only count the votes real-time, they also print paper ballots after each vote. These ballots are deposited in the sealed ballot boxes, providing a (machine) independent way of counting votes after all ballots have been cast.) What are advantages and disadvantages of this procedure? If the electronic voting machine and the paper trail differ in end results, which one of the two should be considered to be the most accurate end result? Name at least one argument for each and give a final conclusion.
 - (b) Would making the source available of the software with which votes are recorded make a difference? Why (not)? Does using an electronic voting machine with open source software and a paper trail solve all problems with electronic voting? Motivate your answer.

3. Another way to organize voting is to allow eVoting voting over the Internet. The last time this happened in the Netherlands was during the General Elections in 2006, for expatriates (Dutch citizens living outside of the Netherlands) only.
 - (a) Does eVoting fulfill the conditions listed above?
 - (b) eVoting is often compared to 'postal mail voting', where voters are allowed to cast their vote via mail. Does postal mail voting fulfill the conditions?
 - (c) Why do you believe expatriates are given these options? Is this problematic?

Procedure

Submit your assignment through "Safe Assignment" in BlackBoard on or before one o'clock (13:00) on **October 12**. Deadlines are **strict**. The dropboxes close automatically, after the deadline it is not longer possible to submit your assignment. If you have problems with submitting then mail one of the instructors personally, **before** the deadline. The assignment must include **a title, your name and student number, and at least three references (e.g. a book other than A Gift of Fire, a news article, a Web site)**. Show where the references are used in the text by quoting the reference: More information on writing can, for example, be found in a book such as this [1] one.

References

- [1] Justin Zobel. *Writing for Computer Science*. Springer Verlag, second edition, 2004.