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ANALYSIS OF REAL TIME ELECTRONIC VOTING SYSTEMS

As technology has moved forward in several aspects of our lives, the increase in use of mechanics and electronics has also emerged. The use of mechanics in the area of voting was introduced as early as the 1890s with the invention of the Herman Hollerith punch card machinery for the US census, and later developed into electronic voting. Electronic voting, or e-voting, is a term encompassing several different types of voting, embracing both electronic means of casting a vote and electronic means of counting votes.

As the area of voting has evolved from public voting, in the early US, to the use of paper ballots with mark choices, the area of electronic voting has also evolved. Electronic voting has changed from the use of punch cards to the use of optical scan systems and specialized electronic voting kiosks (including direct recording electronic voting systems). Electronic voting can also involve remote transmission of ballots via telephones or private computer networks, and the latest development is voting over the Internet.

Electronic voting technology at polling stations can speed up the counting of ballots and provide improved accessibility for disabled voters. A voting system providing remote voting via the Internet could improve the accessibility and provide an even more convenient voting process. It might also lead to greater voter turnout in elections, as well as phase out existing cumbersome (and insecure) processes of absentee voting.

The promises of accuracy, security and precision have driven electronic voting systems forward. However, the worries of corrupt or manipulative software have held back widespread adoption of several systems. Especially Internet voting schemes are discussed and criticized. There are many threats and issues with attacks and fraudulent behavior, including network attacks compromised computers and corrupt system components.

In recent years electronic voting has become a very popular and hot research topic. The electronic mean of counting paper ballots has existed for a while now, but the focus now is more on how to cast electronic ballots. Voting via direct recording machines or the Internet could also decrease the use of paper ballots and the manual work of preparation (no need of printing ballots in different languages, etc.) The correctness of these systems is also critical, as there is no room for errors in the electronic recording or counting of ballots.

Electronic voting exists in different forms already, including tallying votes by computer, using electronic equipment in polling stations and voting over the Internet from the voter's own computer or mobile device. There are several types of modern electronic voting systems: optical scan systems, systems to electronically cast ballots,

end-to-end verifiable voting systems, Internet voting systems, which have their own nuances, advantages and disadvantages.

The use of electronic means to cast a vote has many advantages. Using an electronic voting machine at the precinct would reduce the use of paper ballots, as the machine that displays the ballot electronically. It would also make it easier to prepare special ballots for other languages or visually impaired voters programmed into the system, instead of printing out several options. The newest development in the area of e-voting is using the Internet for remote voting. By making the voters able to vote from their homes computer one of the goals is to improve the accessibility for disabled voters, as they don't have to actually go to the polling station. The overall participation would probably also increase because of the more comfort of voting from home, and it would maybe be more appealing to the youth doing the voting electronically.

As we see the use of computers for voting has many advantages, but a system for electronic voting requires means to preserve every aspect of a traditional voting scenario when it comes to security aspects like authentication, secrecy and anonymity. The system has to prevent attacks, errors and any electronic fraud.

As all information systems, an e-voting system is also vulnerable against computer attacks. Although Internet voting may improve several election factors, there are concerns that the benefits are outweighed by the issues of many potential security threats. The security flaws often concern the voter's home computers, and that these are the weakest link because people do not keep their personal computers secure.

Electronic voting systems have many functions, including encryption, randomization, communication and security systems. Cryptography can be used to protect the communication between the user's browser and the election server, to ensure privacy, and for verification purposes. The technology of cryptography is relied upon to ensure integrity and confidentiality of network traffic.

The advantages and benefits of real-time electronic voting systems could be outweighed by the issues of the many potential security threats. There are critical security threats to electronic voting systems, but developed secure cryptographic methods and techniques (symmetric encryption, hash functions, public key encryption, digital signatures, digital certificates and so on) can provide secrecy, integrity and proofs of correctness, countering many of these potential attacks.