The problems with a paper based voting system

A White Paper by Thomas Bronack

Problem Overview

In today's society where electronic technology is growing at an ever increasing rate, it is hard to understand why governments are not converting their paper based election systems to electronic form to guaranty "One Person – One Vote, and to eliminate fraud and corruption.

An example of how a paper based voting system is flawed and prone to corruption can be found in the Haitian elections, where the last election was invalidated due to fraudulent paper ballots (produced in Dubai) used to stuff the ballot boxes and elect a president illegally. To repair this damage it has already cost the Haitian government approximately $100,000,000, which could be a recurring cost if the fraud occurred again, and it is difficult to bring charges against the people committing the crime due to lack of evidence and an audit trail that could be used as a "Chain of Evidence" by prosecutors. Another example is when paper election ballots ran out at an American election and additional ballots were produced using a printer and make-shift process for creating the new ballots on white paper instead of the normal blue ballots. People rushed to obtain the new white ballots and quickly completed them and stuffed them into the ballot boxes in a manner that was not traceable and could have been fraudulently submitted, showing that even first world countries suffer from the use of paper based ballots.

The Impact

By allowing for the continued use of paper based voting, it is much too easy for corruption to occur, resulting in the people's voice not being clearly heard, or drowned out entirely by fraud. If the people's voice is not the foundation of our election system, what good is having an election in the first place? The election of fraudulent and corrupt politicians has led to countries that are more dictatorial then democratic, drowning the people in misery brought on by funds being routed to private causes and corrupt individuals instead of being used to support the people where the funds could be used to improve their lives, develop a better infrastructure, or create a better education and medical system, and generally improve the well-being of the countries society. All because politicians who are in charge of setting the direction and foundation of the election system are perhaps a part of the problem themselves.

Setting a New Direction

To eliminate the problems brought on by the use of paper ballots and integrate safety policies designed to root out fraud and corruption, while guarantying "One Person – One Vote", it is imperative that an electronic voting system be implemented. This system would provide ballot displays on a video screen instead of paper. Help screens would be available to the voter by simply clicking on a button, and data entry validation can guaranty that all necessary ballot fields have been entered correctly – thereby eliminating data entry failures or votes being lost due to illegible hand writing or mistakes (like not punching a hole in the right selection field, or using a pencil / pen that cannot be read by a scanner). But first, you must insure that the voter is who they claim to be and not a name found in the local cemetery or obituary column. Secondly, you must insure that the voter has not voted previously at another site in this election. How do you do that?

Using a Voter ID Smart Card that contains the voter's bio-metric data (eye scans, facial recognition, palm scan, finger prints, etc.) stored in the smart card's chip and readable at the voting station would verify that the voter is who they claim to be (thereby eliminating the voting dead that we so commonly hear about – think Chicago and Mayor Daly). But, simply verifying that a person is who they claim to be is only part of the resolution, you must also have a means to validate that the voter has not previously voted in this election – or that they are an eligible voter in the first place (i.e., felon not allowed to vote, those people on terrorist watch lists, or other reason that would stop a person from being allowed to vote).

The features of an electronic voting system

Now that we realize the pitfalls of a paper based voting system, let's see what should be included in an electronic voting system that would correct problems and improve the ability to capture and prosecute people committing crimes related to voting fraud and corruption.

Since the basis of any voting system is "One Person – One Vote", it stand to reason that we must verify that a voter is who they claim to be and that they have not previously voted in this election at another site (to eliminate double voting). This can be accomplished by creating a Voter ID Card based on the individual voter's bio-metric information (which is unique to only that individual). The Voter ID Card is created during the Voter Registration process, and when successfully completed the voter is added to the "Eligible Voter's List". This list is used to validate that the voter is indeed allowed to vote in this election at the location they have entered. The process includes:

1. Voter enters registration station and completes required forms relating to name, address, and other contact and identification information as deemed necessary. This data is used to create a Parent Record in a Registered Voter Data Base.
2. The voter then provides bio-metric information in the form of a digital picture for facial recognition, eye scan for Iris recognition, finger prints, palm print, and any other bio-metric information deemed necessary. The bi-metric information is attached to the voter's Parent Record as a Child Record so that it can be scanned without knowledge of the individual it belongs to. If a match is made and legal authority is provided, then voter's Parent Record can be viewed to obtain the name and contact information of the voter.
3. The voter is provided with a Voter ID Smart Card that they can use when casting their ballot.
4. On Election Day, the voter enters the voting station and presents their Voter ID Card to the guard; inserts their Voter ID Smart Card into a Card Reader while submitting to a bio-metric scan (i.e., Iris Scan, or Finger Print Scan). The card's bio-metric information is compared to the bio-metric information contained in the Child Record (the card cannot be removed during the verification process). If a match is made, then the voter information if forwarded to the voting activity data base to determine if this voter has already voted in this election at a different site (to eliminate double voting). If the voter fails these test, their card remains in the card reader and the guard is notified of the violation. The guard can then detain the voter and their voting card for questioning, and even apprehension and possible arrest. If the voter passes both of these tests (approximate time is between 2 and 5 seconds depending on volume) they are allowed to proceed to the voting booth
5. In the voting booth, the voter places his card in the reader slot and is provided with a video display to be used to cast their ballot. This display can also offer a language selection, and instructions on how to cast their ballot.
6. When the ballot is submitted, the voter's record is marked as "Cast a Ballot" and the tally of votes is updated. This allows the system to maintain a constant tally of votes per candidate, which can be broadcast to officials and the media as dictated.
7. When the election is completed, a complete tally of all of the votes is made available to executives, officials, the media, and the general public so that the winner can be determined and announced within minutes.
8. All throughout this process, audit trail records are maintained, as supportive evidence, and even a picture can be taken when the voter cast their ballot as complete evidence that their vote was cast at the unique voting station with a time and date stamp.

The above process satisfies the "One Person" aspect of any voting system, while the program used to guide this process guaranty's the "One Vote" aspect of a good voting system.

Both the Audit Trail and Documentation compiled during this process can be used as supportive evidence should a fraud or corruption activity occur. After the election is completed, the Voter

Activity Data Base is archived, so that investigations can be conducted at a later date should violations be detected, or suggested.

In an electronic voting system, an audit trail can be easily integrated into its operation – from initial voter registration to after the voter has cast their ballot. The process would start with the issuance of a Voter ID Card based on smart card technology and an individual's bio-metric signature. This card could also be used for other services like Motor Vehicle Licenses, and to register for other social services offered by the public sector, or business services offered by the private sector – one card used for many purposes because it can guaranty that the person is who they claim to be. These cards could also satisfy the requirements of the "Real ID Act of 2005" which is an act created after the 9/11 tragedy and whose compliance must be completed by October, 2018. Many states must meet these requirements anyhow and implementing a smart id card would fulfill many additional needs.

How to construct and implement an electronic voting system

In order to construct this type of system, you must perform a "Needs Analysis" to determine what has to be included in the electronic voting system. From the Needs Analysis, "Architectural Design" and "Engineering Design" Documents are created to define requirements that must be met when creating the system. A Request For Proposal (RFP)" is developed and Vendors Selected to respond to the RFP designated. The RFP is sent to the selected Vendors and a response date is defined in the document. On the Response Date, a review panel is convened to review the responses and select vendors to participate in the construction of the electronic voting system.

The benefits derived from an electronic voting system

By now you can realize some of the benefits derived from an electronic voting system, but let's list them anyway so they are clear:

1. Guaranteed "One Person" through a Voter ID Card based on a Smart Card whose chip contains the bio-metric information for the individual.
2. Guaranteed "One Vote" through the electronic voting systems application processing.
3. Audit Trail to use as an Evidence Trail should investigations be warranted for criminal processes, or just to seek ways to improve efficiency.
4. Documentation provided by the system can be used to support prosecution of people committing fraud or corruption.
5. Near Real-Time voting results.

6. Ability to provide voting results immediately upon close of election.
7. Use of Child Records for searching bio-metric information in support of criminal, or even medical research.
8. Elimination of Paper at a great cost savings.
9. Ability to support people with disabilities and those that speak different languages.
10. Ability to provide instructions and examples to assist voters using the system.
11. Much easier to control security, and a much faster voting operation.
12. A means to eliminate voting fraud and corruption.
13. Possible use as a remote operation, where voters could cast their ballot from home.
14. More benefits can be provided, but you get the jest of them from the list compiled above.

Another benefit that can be obtained from this system is the ability to create mobile and server based applications to assist voters by provided them with information and services that would speed up the voting process and eliminate a lot of confusion. For example, should a voter change their address, it can be accomplished via an application that would update the voter profile and provide them with the location that they now must vote at. Other applications could include news feeds, and other applications that would assist voters in particular and the public in general.

Let's get started building an honest and fair society through an electronic voting system

Now that you have become familiar with what an electronic voting system is, don't you think we should build and use one to support our elections? The people in charge of voting in your country, state, city, or municipality must be made aware of these benefits and urged to consider them when designating a voting process.

The Voter ID Card is an example of smart card technology that can prove a person's identity, and can be used for multiple applications other than simply voting. Consider using this technology for other services where a person's identity is essential.

How to contact me for further information

I can be reached via email at bronackt@gmail.com and would love to discuss this system with people having a voice in the decision making process relating to selecting a voting system to use, or those people wanting to learn more or discuss alternatives.