

Voting, Vote Capture & Vote Counting Symposium

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ABSTRACT

Elections, and enfranchisement of citizens, are a foundational element of democracy, yet the implementation of elections in terms of both technology and process varies widely. [1] New voting technologies offer promise yet create new risks; and the process and technology must be simultaneously adopted and crafted. In order to explore both the promise and the risk, a Symposium at the Kennedy School of Government was convened. The attendees for this event included technologists, election officials, political scientists, policy analysts, notable press experts, and activists. From that Symposium the authors developed a set of policy and technology best practices. [2] This highlights document reports those practices.

Categories and Subject Descriptors

K.4 computers and society; K.5 legal aspects of computing; J.4 social and behavioral sciences; H.5.2 user interfaces

General Terms

Security, Human Factors, Legal Aspects.

Keywords

voting, elections, process, democracy

1. INTRODUCTION

The Vote, Vote Capture and Vote Counting Symposium was a symposium for open discourse over voting processes and technologists. The Symposium required careful selection of participants and planning in order to obtain the best possible value from the participants. The primary goal of the symposium was to set out the major issues surrounding vote collection and tabulation for contemplation and discussion. This goal was successful, and in fact a series of best practices emerged from the symposium.

2. SYMPOSIUM

2.1 Organizational Philosophy

The organizational philosophy of the event was to bring together a diverse set of experts, off the record, in order to share honest

concerns without the glare of public scrutiny. The goal was a honest, respectful informed discourse. As a result the invitations went to a large number of individuals that reflected every possible perspective on the topic of voting. Indeed the range of represented opinions was widely divergent. The only group that was not represented was vendors. Vendors have a professional responsibility to promote and advocate their chosen technologies.

2.2 Agenda

The agenda was based around participants, not presentations. In terms of organization there were two panels after the introduction. The first panel introduced the process to all participants, with Mary Kiffmeyer, Secretary of State of Alaska joining Thad Hall and Conny McCormack presented the subtle organizational and political science challenges to voter participation, not unlike [2]. The second panel, consisting of Rebecca Mercuri, Avi Rubin, and Lorrie Cranor, described the sometimes invisible technical challenges to secure reliable voting.

For the remainder, in fact the majority of the day, the participants broke up into groups. Each group was less than twenty people and had a specific set of topics to discuss. Every group discussion had at least one representative from the following categories: election official, activists, technologist, social scientist, and legal expert. Each group had a graduate student participant who took notes, and guided the discourse as necessary.

2.3 Process

The dialogue was sufficiently productive that the near unanimous consensus of the participants was that a set of best practices be developed from the notes and discourse. A mailing list that included all attendees and several invited individuals who were unable to attend was configured. The draft document was sent out to the selected participants. There was considerable disagreement that significantly changed the final document from the initial draft. The final best practices document, a consensus document based on multiple iterations is described in the following section.

3. BEST PRACTICES

There were seven major themes that emerged in the discussion at the symposium. First, there is a need for immediate steps. Second, a hybrid system that includes paper for audit and electronics for speed and flexibility can meet the requirements of a good electoral system outlined in the best practices document. Third, there is a critical need for investment in the

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human element. Fourth, vote tallies can be speedy or accurate, but not both, and the public should understand this very human distinction. Fifth, design standards are needed for all technologies – including paper ballot - with respect to usability. Sixth, transparency in processes, including electronic processes, is critical. Finally, electronic systems require an audit trail consisting of independent non-aggregated artifacts of which paper ballots are the only currently feasible option for the public at large.

3.1 Immediate Steps

For pages other than the first page, start at the top of the page, and continue in double-column format. The two columns on the last page should be as close to equal length as possible.

3.2 A Hybrid System

Paper and electronic systems each have unique and potentially complementary strengths. Electronic systems can provide fast counts, suitable ballots, and ease the vast logistics problems of voting. Paper provides auditable counts, ease of use, and voter confidence. Emphasis on accurate vote counting must be balanced with speed – a tally can be quick or rigorous, but not both.

Paper and electronic systems also both have flaws, and a failed implementation can exacerbate both. For example, a method which provides continuous printed paper for verification, rather than individual records of votes, provides a temporal record of voting and can remove anonymity. Electronic votes have more flexible interfaces, but this enables not only better interfaces but also interfaces that have more subtle or even emergent errors.

Processes should be designed to address the unique strengths and weaknesses of particular voting systems. Process design should assume that failure will occur and address the possibility of failure before an election. There should be agreed-upon rules for resolution of uncertainty before the conflict occurs

3.3 Invest in the Human Element

With improved technologies, the people who administer elections matter more, not less. More training, additional incentives and improved remuneration for poll workers is needed immediately. The requirements on poll workers are increased with the complexity of the voting technology because the failure modes become more complex.

3.4 Speed & Accuracy are Exclusive

Digital counting systems enable fast counting. Vote counts can be quick, or they can be verified and audited. The press is responsible for communicating that early totals are less certain, rather than presenting more accurate later counts as alterations of an earlier state. Speed and accuracy are mutually exclusive in vote counting.

3.5 Standards are Needed

Rigorous testing and certification of electronic voting technologies is needed, for security, reliability, and usability. Such testing should be led by NIST and the EAC and should be implemented quickly.

Usability standards are also needed. Current standards are an important but inadequate start. Universities can provide

expertise in usability testing. Volunteer corps of students of faculty with expertise can be developed either in a partisan or non-partisan manner for interface testing. There is a wealth of usability expertise but no mechanism for providing that expertise to those who administer elections. The standards for usability testing do not currently embody the best practices in usability, and if they did so would need to be regularly updated to reflect progress in the field.

3.6 Open Technology

The acquisition and evaluation of election and voting technology should be subject to public participation. Further, symposium participants advocate the use of open code in electronic systems to facilitate transparency. EAC and NIST voting standards should be open and implemented freely.

3.7 Paper Ballots Remain Necessary

There should be extensive random auditing of election outcomes as well as a binding reconciliation process. Ballots should be tracked through a custody chain.

4. CONCLUSIONS

Digital voting systems are not solutions to the chronic process and human resource problems of voting. In fact, digital system exacerbate those problems by creating a mismatch between process and technology, as well as producing newer, more complex failure modes. With appropriate standards, auditing, and evaluation digital voting systems can offer greater flexibility in terms of interfaces, and potential for very fast counts which can be later verified. The Help America Vote Act was an inadequate first step in terms of standards, definitions, and action. [4]

5. ACKNOWLEDGMENTS

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