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Asking the Right Questions About Electronic Voting—*Summary*

COMPUTER SCIENCE AND TELECOMMUNICATIONS BOARD

Background

High profile problems in recent elections have resulted in calls to accelerate the use of information technology in the voting process to help avoid such problems in the future. Such an approach, however, is not straightforward as is suggested by an emotional public debate that has arisen about electronic voting. While election officials believe electronic voting systems offer the promise of conducting and administering elections more effectively and at lower cost, a number of concerns have been raised about security and other aspects of these systems. To help address these points, the National Science Foundation asked the NRC to examine electronic voting issues. A first step in doing so is to formulate key questions that must be addressed by election officials, policy makers, and the public about the use of electronic information technology in the election administration. This report provides an extensive list of questions under several topics constituting the election process, along with a number of conclusions to help set the questions in perspective.

Topics for Questions

Three threads define the context for this analysis. First, the election process is complex and highly decentralized. For example, there are over 185,000 voting precincts in the United States and about 800,000 voting machines. Second is the wide variety of voting technologies that have been proposed to increase efficiency and reduce problems. Third is the need for public confidence in elections, which must be seen by all to be fair.

Within this context, several topics and subtopics were identified for which the questions were articulated. Technology issues made up the first topic, which was further broken down into information technology for voter registration and information technology for voting. A key issue for the former is to develop processes that ensure that those not eligible, to vote for a variety of reasons, are removed from the roles while making sure that eligible voters are not inadvertently removed during the same procedures. The latter includes two issue areas of particular significance: security and reliability, and usability and accessibility including human factors engineering.

The other topics identified were the life cycle cost for information technology systems—operations and maintenance which will almost certainly exceed acquisition cost; poll worker training to be able to recognize and correct problems occurring during voting; data on many aspects of the election process that are now lacking and are needed to

improve the system; public confidence in elections; testing and certification; funding and sustaining improvements over the long term; institutional issues given the short lifetime of information technologies compared to that of non-electronic voting systems; and research questions. Over 80 questions were developed and are presented in the report.

Findings and Conclusions

A number of conclusions were identified that help clarify the debate over electronic voting systems and provide a framework for putting these questions into perspective.

Electronic voting systems offer potential for voting and election management that is an improvement over what has previously been available. However, the realization of this potential requires a commitment to this path by the nation, the states, and local jurisdictions that is not yet evident. This path will require, among other things, research, funding, educational efforts, and new standards and testing processes. In addition, **the desirability of electronic voting systems should be judged on the basis of whether their use will significantly improve the process of election administration.** When electronic systems offer the opportunity to significantly improve at reasonable cost the process of election administration in multiple dimensions over what it is today, e.g., more efficient, less costly, more trustworthy and secure and so on, it makes sense to consider their deployment.

Judgments about the ultimate desirability and feasibility of electronic voting systems should not be limited to the features and flaws of the systems demonstrated to date. Technologies improve over time, and it is thus inappropriate to make strong generalizations about the systems of tomorrow based on inspection of the systems of today. At the same time, there are some technical realities that are exceedingly likely to persist over the long run. Conclusions based on such realities do have a staying power that conclusions based on the today's state of technology do not.

Trusted election processes should be regarded as the gold standard of election administration, where a trusted election process is one that works, that can be shown to have worked after the election has been held, that can be shown to have not been manipulated and to have not led to a large number of mistaken or lost votes, and that can be shown to reflect the intent of the voters. Trusted election processes increase the likelihood that elections will be regarded as fair, even by the losing side and even in a partisan political environment.

Many parties have made important contributions to the public debate over electronic voting:

- Electronic voting skeptics have raised important questions about the security of electronic voting systems that should not be discouraged or suppressed. Electronic voting systems, like all complex systems, are fallible and potentially susceptible to deliberate or accidental compromise, and some kind of backup against the possibility of fraud or malfunction should be available if

and when allegations of such occurrences arise. The paper trail may be a mechanism that can serve this function, but whether it is the only or most appropriate such mechanism has yet to be determined.

- Political scientists who have studied elections for many years have identified data whose collection would enable the public to judge the accuracy and usability of voting systems in use and the accuracy and reliability of the voter registration systems used by states, counties, and municipalities. Independent observers need relevant and reliable data in order to judge the adequacy of the systems in use, and election officials should be encouraged to acquire such data and to make it publicly available.

- Legislators in many states have publicly aired many important issues related to electronic voting. In so doing, they have placed a considerable amount of useful information on the public record, and they have successfully balanced a variety of concerns in some of their legislative efforts.

At the same time, it is appropriate and proper that election officials are properly concerned about many aspects of election administration, and they must balance a variety of considerations—including security, speed and accuracy of reporting election results, usability, affordability, turnout, and compliance with Federal, state, and local election laws. It is entirely reasonable and understandable that they take an operational perspective, as might be expressed in the question "Will a particular electronic voting system help to significantly improve election administration and management with respect to all of these considerations?" If they can in good conscience answer this question in the affirmative, acquisition of such a system is justifiable.

There is enormous emotion and passion felt by all participants in the public debate about electronic voting that reflect a very heartfelt and strong commitment to democracy. The nation, however, is better served by passionate engagement that by dispassionate apathy, and the passions expressed by the participants should be commended and not disparaged. It is also hoped that the questions developed in this study can help the nation overcome political and technological barriers that impede the improvement of election systems.

For additional information:

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COMMITTEE ON
A FRAMEWORK FOR UNDERSTANDING ELECTRONIC VOTING

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