ELECTION ASSESSMENT

Information Quality Process Improvement

Election Assessment Hearing

June 29, 2005

Preliminary Report of Findings:

Voice of Election Customer Summaries

September 22, 2005

http://www.ElectionAssessment.org

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1. INTRODUCTION AND FRAMEWORK

1.1. INTRODUCTION

An Election Assessment Hearing took place on June 29, 2005 in Houston, Texas. Its purpose was to begin capturing the voice of the customers for the electoral process (the voters), to identify how to understand the quality of election processes, to review evidence and make preliminary assessments, and to foster the improvement of election processes by administrators, policymakers, standards bodies, advisors and other voting stewards and participants.

The testimony and analysis presented at this hearing described numerous problems and irregularities in America's election processes. The fact that the election processes of the United States of America have significant problems shocked the country and put it in a state of limbo for 29 days in November, 2000. Many of the issues that came into view then remain with us still.

This survey of election customer voices may serve as a base on which established professional methods for improving the quality of election processes may be founded.

1.2. FURTHER INPUT AND PEER REVIEW

We believe that we have identified many of the chief concerns that describe stakeholder expectations for election processes. However, we will keep our submissions email line open. Additional comments may be sent to submissions@electionassessment.org up until December 15, 2005. Submissions must include responses to the questions in the Election Assessment Call for Submissions cover document at:
http://www.electionassessment.org/downloads/eah_call_for_submissions.doc.

Peer review of quantitative analyses

Among the submissions we received are quantitative analyses which may already offer a factual basis for understanding the quality of election processes. We encourage further peer review of these analyses, since valid measures are useful as a foundation for encouraging a professional approach to identifying causes and implementing solutions. These analyses are listed at http://www.electionassessment.org/PeerReview/ . Peer review submissions may be sent to peerreview@electionassessment.org.

1.3. WHY THE ELECTION ASSESSMENT HEARING

Since the 2000 election, many researchers, analysts, and investigators have been examining issues and pursuing improvements in election processes throughout the United States. Along with numerous long-standing issues associated with the conduct of elections, the impact of electronic voting technologies has in recent years also become a matter of great concern.

The Election Assessment Hearing was organized to help assure that the strong interest expressed by numerous citizens to improve the quality of elections could be taken up within a professional, neutral and methodologically sound context.

1.4. WHY REAL ELECTION REFORM IS IMPERATIVE

A democracy is founded on the principle that citizens in a free society have the right to choose who will represent them in the governance, order, protection, and services that provide for the general welfare of the citizens of that society. This principle places supreme importance on the processes by which citizens choose their representatives.

If the election processes fail, causing the disenfranchisement of any of its citizens and affecting their ability to participate as voters or candidates – to run for office, to vote if they wish, to have their votes cast accurately as intended, to have their votes counted accurately as they were cast, and to have their votes recounted accurately as necessary in any challenge to an election – the consequences are plainly severe. Elections express the will of the populace. When they fail, they cannot be said to express the will of the public and the bond of confidence, representation and participation between the government and those it serves is broken.

Left uncorrected, broken election processes can undermine confidence not just in the election processes – they can undermine confidence in the government processes themselves.

1.5. ELECTION ASSESSMENT HEARING PRELIMINARY REPORT AUTHORS

The following panelists produced this report:

Seth Johnson, information quality improvement consultant

Marybeth Kuznik, pollworker

Evelyn Roberson, former election administrator

Further details regarding the Election Assessment project may be found at http://www.electionassessment.org.

A full listing of Hearing presenters and submissions is provided in the Appendix. These documents may be accessed from the Election Assessment website.

1.6. METHODOLOGY AND FRAMEWORK

1.6.1. FOSTERING A CULTURE OF ACCOUNTABILITY AND QUALITY

The Election Assessment project is an effort to foster election reform on the basis of professional practices for assuring quality, using techniques long established in service and manufacturing industries. The same means by which world-class organizations improve their processes on a factual basis every day are the means by which permanent and sustainable election reforms and reliable election outcomes can be achieved.

Election Assessment supports the application of information quality improvement principles to the election process, an approach that is inherently well suited to Federal- and State-level policy distinctions and that is not impeded by a number of confusions regarding accuracy as a measure of information producing processes (such as elections), the relationship of information technology to overall processes, and the impact of technology considering the unique nature of elections.

Overarching all other concerns is our recognition of the need to encourage a serious, responsible and accountable culture dedicated to improving elections on a reliable factual foundation.

This survey of issues and conditions in the conduct of our elections is designed to enable us to understand, in the voice of the customers who depend on the process, what characteristics describe a quality election process. These characteristics may then serve as a basis for assessing and improving the quality of the process. Subsequent steps to pursue under the quality improvement framework include determining the extent to which quality requirements are being fulfilled and applying the Shewhart cycle, analyzing root causes for defects and recommending and implementing improvements to the process in a controlled manner.

Election Assessment will continue to pursue and support the following courses of action:

- The establishment of accountability for the quality of election processes and the information they produce
- Surveys of stakeholders in the election process to understand the quality of the process
- Application of sound principles and clearly defined processes to assure election process and information quality
- Factual analysis of the systemic barriers to information quality in United States elections
- The establishment of clearly defined roles for stewardship of election information process quality
- Fact-based quality assessment and improvement projects initiated by citizens, election process stewards and other election participants, which may provide reliable baselines against which success may be gauged
- Appropriate analyses of costs of election processes and corrective measures necessitated to correct causes of defects

- The establishment of processes appropriate for assuring the quality of information processes:
  - *Establish definitions and common understanding of requirements*
  - *Analyze and establish common understanding of the elements of the election process*
  - *Measure the quality of the election processes and the information they produce*
  - *Measure the costs of election processes and of corrective actions for nonquality results*
  - *Establish processes for correcting vote errors, including audit, recount and revote processes*
  - *Improve election processes on an ongoing basis until we have near zero defects in them*

1.6.2. ELECTION REFORM AND PROCESS IMPROVEMENT

Centralization and Decentralization

Because it does not presuppose centralized or decentralized approaches, process improvement is a good fit for improving election processes in the United States. The method is designed to encourage process performers to implement improvements in their own processes in a controlled fashion, based on factual observation and measurement. As long as the principle of management accountability is in place at the appropriate level for the appropriate contest, and as long as valid means are in place by which the reliability of the process can be assessed factually, it is possible to improve voting processes in a manner in which we may hold confidence.

General Principles of Quality

There are four fundamental principles for managing quality, whether they are to be applied to the manufacturing of tangible goods, service delivery, or the production of information such as vote counts:

1. ***Focus on Process Improvement.*** Quality comes not from inspecting defects out, but by improving the processes to error-proof them to prevent the creation of defects. A major impact of the Help America Vote Act (HAVA) was to substitute one voting technology for another known-defective voting technology (punch cards). Simply substituting one technology for another does not constitute improvement. To improve a process one must define the process clearly, understand the causes of defects and error-proof the process; then train the election officials, poll workers, judges, and voters.

2. ***Use Proven Scientific Methods.*** Model processes on objective and provable methods such as Statistical Quality Control, the Shewhart Cycle (Plan-Do-Check-Act), Root Cause Analysis. Several proven quality management methods are used in manufacturing to measure, improve, and control manufacturing process quality. These very same tools are applicable to the improvement of the election processes.

3. ***Take a Customer Focus***. Quality has meaning only in the context of the customer, not the manufacturer, or the provider. Customer satisfaction is the real measure of a quality product or service. Every U.S. citizen is a Customer of the election processes. If the election processes fail, the failure disenfranchises voters and disserves American citizens. Quality election results do not mean every voter is happy with the outcome of the election, but that the election processes had integrity and assured the voters that their votes are cast as they intended and are subsequently counted accurately.

4. ***Management Accountability***. Managers who oversee processes that consume resources such as money or materials or that put people to work; or that acquire resources, such as hiring people or procuring raw materials or creating information, are accountable for the integrity of those processes to create or apply those resources for the benefit of all stakeholders. Managers who oversee the election processes likewise must be accountable for the integrity of the election processes under their charge so that they result in a fair, honest, accurate vote result.

These same four principles must apply to the election processes if we are to accomplish real reform that can eliminate the root causes of the defects seen in the recent elections.

Key Process of Quality Improvement

Every valid quality system is based on the process improvement technique called the Shewhart Cycle, known as PDCA or "Plan-Do-Check-Act," or a faithful variation of that cycle. Once problems are identified, improvements are made by those four steps in the cycle:

Plan. You must plan for an improvement. This consists of two components:

Analyze root cause. All process failures have precipitating causes, but they also have root causes behind the immediate precipitating cause(s). Before an improvement can be determined, the root causes must be identified. Failure to do so will sub-optimize, at best, an improvement, or fail to solve the problem and/or introduce negative side- effects, at worst.

Define improvement(s). The design of quality improvements, or election reforms, must be performed in a way to eliminate the root causes of the defects.

Do. To assure the effectiveness the defined improvements must be implemented in a "controlled" way to test and assure the improvements, solve the problem and prevent recurrence of the defects without introducing negative side-effects.

The infamous 2000 Palm Beach County "Butterfly Ballot" is an example of defining an improvement (enlarging the font of the text for readability for the elderly population) that was not tested in a controlled environment. As a result, the "Do" (testing of the improvement) became apparent on the morning of the election, when scores of voters came out saying, "I think I voted for the wrong candidate."

Check. Here you test the improvement to see if it worked. If not you must go back and re-implement or re-plan based on the cause of failure.

Act. Once confirmed, the improvement(s) are applied to the rest of the process implementations and documented, with training of those requiring knowledge and put in control to prevent decay of the improvements.

1.6.3. IMPROVING ELECTION INFORMATION PRODUCTION PROCESSES

Analyzing Technology Development and Other Election Processes

Election processes are information production processes. Because information production processes very often employ computer technology and software, they entail special attention be paid to both the processes by which electronic hardware and software are developed and the processes which employ those systems.

Once problems are identified with an information process, root causes for issues with technology development are analyzed distinctly from issues with "business-side" processes. We therefore place technology development and other processes under separate headers in our analysis.

The Role of the Voice of the Customer in Election Processes

In improving information production processes, surveying the voice of the customer plays a particularly important role, first of all because it is essential to the bridging of barriers that often otherwise arise between technological and business processes. The design and development of technology must meet stakeholder requirements across all processes and systems that work together to produce information.

But beyond this, it is the voice of the end customers that defines the quality of the process's product. In the case of elections, it is the voice of the electorate, who depend on reliable vote count results, that determines the success of the process as a whole.

Therefore, the voice of the customer bridges two potential barriers: that between developers of information technology and those who conduct election processes, and that between the election processes as a whole and those who depend on its outcome.

If election processes are not improved on the basis of surveying the expectations of internal stakeholders and end customers, the consequences are that great expense will be incurred as processes are implemented in which the electorate may very appropriately not have confidence.

On Accuracy and Information Quality

We find it useful in the elections context to make a special comment on one information quality characteristic in particular: the characteristic of *accuracy*.

In considering the 2000 election, many commentators pointed at hanging chads and other imperfect records of voter intent, and treated these as implying human imperfection in the counting process was at the bottom of the problems that were on display in Florida at that time.

In truth, a far more significant source of the difficulties was the general perception that automated voting machines could assure accurate vote counts in themselves. This confusion has led to far greater problems, including the establishment of multibillion-dollar federal programs that have encouraged a vast process of nationwide scope, of replacing existing technologies with others in a profoundly uncontrolled fashion.

It is important to understand that when we assess the accuracy of information production processes, the accuracy that we are concerned with is not a measure of any technology in isolation, but the extent to which the information produced by the process as a whole reflects reality – in the case of elections, the actual intent of the voters. Larry English defines accuracy as "the degree to which data correctly reflects the real-world object or event being described."1

Usability Studies and Accuracy

A body of research has arisen regarding the fallibility of the voter's recording of her intent on her ballot. Various programs are conducting usability studies for different technologies, from the standpoint of how various interfaces would facilitate more precise recording of voters' intent.

For all the considerable value of this field of analysis, it does not address the real question of accuracy that we must consider for any automated election process: to what extent does the outcome accurately represent reality, the actual intention of the voters? This question can only be addressed by comparing the outcome of the process as a whole against reality. This entails either comparing the vote results against the results of a hand count of a representative sample of physical, human-readable ballots, or comparing the results against the results of scientific exit polls.

For further details regarding accuracy as a measure of the quality of information production processes, see Larry English, Defining and Measuring Accuracy, available at http://www.infoimpact.com/articles/DMR_7.03DefiningandMeasuringAccuracy.pdf.

Transparency, Technology and Elections

Due to its uniquely competitive character, the integrity of the traditional election process depends critically on its transparency to all concerned parties. Since automation often removes that transparency and therefore undermines confidence in the process, we observe that the very introduction of technology into the process will often be problematic until dependable means can be established to instill confidence in the quality of the vote results.

General Information Quality Processes

The following are key processes entailed in establishing an overall system to assure information process quality:

- *Establish definitions and common understanding of requirements.* If we don't understand process requirements, we can't assure quality.
- *Analyze and establish common understanding of the elements of the process.* All points in the process at which information quality can be impacted must be understood.
- *Measure the quality of the processes and the information they produce.* The quality of the product serves as the measure of the process as a whole.
- *Measure the costs of the processes and of corrective actions for nonquality results.* The production of nonquality outcomes entail unnecessary costs.

[1] L. English. Improving Data Warehouse and Business Information Quality (IDW&BIQ). New York: Wiley & Sons, 1999, p. 147.

- *Establish processes for correcting errors*. Recounts and revotes are unfortunate necessities to correct invalid outcomes and must be prevented by building quality into the process.
- *Improve processes on an ongoing basis*. This is the process of taking known problems, analyzing root causes, and planning and implementing improvements that prevent nonquality.

1.7. PROCESSES EXAMINED

The election processes examined represent the complex of processes that makes up the Electoral System. A brief description of what is included in these processes is included at the beginning of each report of findings.

TECHNOLOGY DEVELOPMENT PROCESSES

- Voting Technology Design
- Voting Technology Certification

VOTER ENGAGEMENT, REGISTRATION, ACCESS AND VERIFICATION

- Voter Engagement and Registration
- Voter Registration Management
- Voter Access
- Voter Verification

CANDIDATE BALLOT ACCESS

- Ballot Access by Prospective Candidates

ELECTION PREPARATION, CONDUCT AND CHAIN OF CUSTODY

- Election Preparation
- Election Day Voting
- Chain of Custody

PROVISIONAL, EARLY AND ABSENTEE VOTING

- Provisional Voting
- Early Voting
- Absentee Voting

COUNTING, RECOUNTING, AUDITING AND EXIT POLLING

- Vote Counting
- Vote Recounting and Auditing
- Exit Polling

2. FINDINGS

2.1. TECHNOLOGY DEVELOPMENT

2.1.1. VOTING TECHNOLOGY DESIGN AND CERTIFICATION

Voting Technology Design: The processes for designing and developing the various voting systems.

Voting Technology Certification: The processes that evaluate and assure that various voting systems meet requirements for accuracy, integrity, security and recoverability in capturing, counting, recounting and/or auditing the vote

2.1.1.1. Findings

Voice of Election Customers

Submitters expressed concerns with voting technology having no paper trail (Fitrakis, B 001 p. 6; Fitrakis, B 003; Thayre, H 002, pp. 1-2), lacking official accountability (Fitrakis, B 003), lacking transparency (Fitrakis, B 003; Thayre, H 001, pp. 1, 2-3, 5; Thayre, H 002, p. 1; Corry, C 004), using proprietary "secret" software (Fitrakis, B 001 p. 6; Fitrakis, B 003; Waymack, J 001; Thayre, H 001, p. 5; Thayre, H 002, p. 3) or outdated software (Waymack, J 001). 15% of Ohio's ballots were cast on devices with no paper trail (Fitrakis, B 003). 40 counties in North Carolina lacked a voter-verified paper ballot (Waymack, J 001). At least 30% of the votes in 2004 were cast on "black box" machines (Fitrakis, B 003).

Submitters also identified concerns with voting technology that allows functionality to be modified dynamically (Harris, B 001, pp. 2, 8, 9; Forrest, K 001, pp. 9-10) and that is susceptible to either inexpensive and relatively unsophisticated exploits (Harris, B 001, p. 2; Corry, C 004) or well-financed exploits (Klein, S 001, pp. 1, pp. 6-7). Problems were identified with technology vulnerable through remote access capability (Harris, B 001, p. 4; Thayre, H 001, pp. 1, 8-9; Corry, C 004), including vote machines allowing technicians to change settings remotely (Windham, B 005). Exploits were described showing means of attacking central tabulators (Harris, B 001, p. 4), falsifying paper trail printouts and removing traces of pre-loaded votes (Harris, B 001, p. 9). The use of flash memory in voting technology was identified as a risk (Thayre, H 001, pp. 1, 9). Voting machines' vulnerability to trojans, viruses, and malignant code was noted, particularly given the predominant use by voting technology vendors of Microsoft Windows operating systems (Corry, C 004). Logic and accuracy tests that did not include setting the system date to election day were also identified as a risk (Moss, B 001 pp. 21-22)

Concerns were expressed regarding Internet or faxed-ballot voting being completely out of public view and unauditable (Forrest, K 001 p. 9).

It was observed that touchscreen DREs designed and tested to the FEC 1990 specification are likely to be vulnerable to electrostatic disruption, and that the high incidence of many anomalies for these machines is consistent with this (Klein, S 001, pp. 1, 5).

High speed ballot scanners were noted as being difficult to test due to their design to be used to count votes for any precinct (Forrest, K 001 p. 7). Voting machines with insufficient storage for votes were noted (Mercuri, R 001 p. 20; Waymack, J 001).

Submitters expressed concern for the use of outdated technology (Herrnson, P 003 p. 1; Herrnson, P 005 sl. 2; Waymack, J 001). The use of voting technology in election processes was described as entailing high costs (Thayre, H 001, pp. 1, 2-3; Corry, C 004).

Reports of Malfunctioning Voting Machines

Many instances of malfunctioning machines were noted in the record (Ananda, R 001 p. 8; Fitrakis, B 001, p. 4; Fitrakis, B 003; Herrnson, pp. 1, 2-3; Klein, S 001, pp. 3-4; Moss, B 001 pp. 24-25, 26; Phillips, R 001 pp. 1-3; Selker, T 001 p. 2; Thayre, H 001, p. 6; Waymack, J 001; Waymack, J 002). Charles Corry provides a history of vote machine failures (Corry, C 001).

Many cases were reported of voting machines with straight party voting functions providing default selections for one Presidential candidate but not another (Corry, C 004; Windham, B 002). A study of voting records in New Mexico proposed that the high under-vote rate in that state could be attributed to this defect (Alter, J 001 p. 1; Alter, J 002 pp. 1-3). These cases were reported in California (Orange County), Indiana, Missouri (St Louis, Jackson County), North Carolina (Mecklenburg, Wake, Durham, Forsyth, Burke and Guilford Counties), Pennsylvania (Philadelphia, Dauphin, Delaware and Lehigh Counties), South Carolina (Berkeley County) and Virginia (Fairfax County) (Windham, B 002).

We received reports of numerous voting machines recording unusual or plainly incorrect vote results (Moss, B 001 p. 26; Waymack, J 001; Waymack, J 002; Windham, B 002; Ananda, R 001 pp. 6, 8, 9, 10; Corry, C 004). This included voting machines in use all day that registered 0 or less votes (Fitrakis, B 001 p. 5), and machines with high Presidential undervotes (Moss, B 001 pp. 26-27; Ananda, R 001 pp. 8, 9). Central tabulator totals were seen changing implausibly (Phillips, R 001 p. 2; Ananda, R 001 p. 9; Waymack, J 002).

In one case, machines showed no Presidential candidate undervotes, despite their exhibiting numerous, varied anomalies interfering with the selection of the Presidential candidate, suggesting that a Presidential candidate was coded as a default value (Phillips, R 001 p. 3). Machines were also reported not recording votes for one presidential candidate and defaulting to none (Phillips, R 001 p. 2-3, Windham, B 002) and having their screens turn blank on selecting a candidate (Phillips, R 001 pp. 2-3). In another case, no option to choose a Presidential candidate was shown (Phillips, R 001 pp. 2-3) or repeated scrolling was reportedly necessary to register a Presidential vote (Phillips, R 001 pp. 2-3).

Many cases were reported of voting machines for which votes cast for one candidate would hop to another or disappear (Fitrakis, B 001 p. 4; Fitrakis, B 003; Moss, B 001 pp. 26, 27; Phillips, R 001 p. 2-3; Ananda, R 001 pp. 5, 6, 7, 8, 9, 10; Windham, B 002), including machines repeatedly requiring recalibrating for this reason (Moss, B 001 p. 26; Phillips, R 001 p. 3). Shifting votes were reported in California (Alameda and Riverside Counties), Colorado (Jefferson Counties), Florida (Palm Beach, Broward, Dade, Hillsboro, Pinellas, Sarasota, Pasco and Lee Counties), Georgia (Fulton, Dekalb, Clayton, Cobb, Douglas and Liberty Counties), Maryland (Baltimore, Montgomery, Harford and Prince George's Counties), New Mexico, Ohio (Mahoning and Franklin

Counties), Pennsylvania (Philadelphia; Montgomery and Mercer Counties), South Carolina (Richland County), Virginia (Fairfax County) and Washington (Snohomish County) (Windham, B 002).

Touch screen failures were reported in California (Orange, Alameda, Riverside, Sacramento and Napa Counties), Colorado (Jefferson County), Florida (Palm Beach, Broward, Dade, Hillsboro, Pinellas, Sarasota, Pasco and Lee Counties), Georgia (Fulton, Dekalb, Clayton, Cobb, Douglas, Liberty and Walker Counties), Kentucky, Maryland (Baltimore; Montgomery, Harford and Prince George's Counties), New Mexico, North Carolina (Mecklenburg, Wake, Durham, Forsyth, Burke and Guilford Counties), Ohio (Mahoning and Franklin Counties), Pennsylvania (Philadelphia; Montgomery and Mercer Counties), South Carolina (Richland and Berkeley Counties), Virginia (Fairfax County) and Washington (Snohomish County) (Windham, B 002).

Submitters also reported frequent instances of machines freezing up on Election day (Moss, B 001 p. 26; Phillips, R 001 pp. 2-3; Test, C 001; Windham, B 002), including opti-scan machines (Fitrakis, B 001 p. 4; Fitrakis, B 003; Martinez, J 001 p. 16; Moss, B 001 p. 26) and during testing (Moss, B 001 p. 26).

Incorrectly programmed punch card machines were noted as causing high rates of third party votes in certain precincts (Fitrakis, B 001 p. 4)

Submitters observed ballots that could not be inserted into certain machines (Ananda, R 001 p. 7; Moss, B 001 p. 26) and ballots rejected by machines (Martinez, J 001 p. 16). Submitters reported absentee ballots not aligning with correct punch holes (Moss, B 001 p. 25; Ananda, R 001 pp. 6, 7)

The Unilect Patriot system was decertified in Pennsylvania based on an analysis by Michael Shamos in which he found that its touchscreen does not function reliably, including occasionally entering a mode in which no touch can be registered on the screen (Mercuri, R 001 pp. 12-13, 14, 21; Mercuri, R 002 p. 4; Mercuri 003 p. 4-5).

Instances of inadequate logic and accuracy testing were noted (Ananda, R 001 pp. 5, 7, 8, 9; Forrest, K 001 p. 7; Moss, B 001 pp. 21-22)

Cartridges used on election day in Ohio were found generating error messages during recount (Ananda, R 001 p. 7). Submitters cited cases of devices malfunctioning due to inadequate vote storage (Mercuri, R 001 p. 20; Waymack, J 001)

Problems communicating with state registration database were observed in Georgia and Richmond, Virginia (Windham, B 002)

In addition, nonspecific reports of malfunctioning machines were reported in Alabama, California (Los Angeles), Colorado (Boulder and Larimer Counties), Florida (Orange, Duval, Leon and Volusia Counties), Georgia (Twiggs, Hancock and Beaufort Counties), Indiana, Louisiana, Maryland (Baltimore, Prince George's County), Michigan (Detroit), Missouri (St. Louis), Nevada (Las Vegas, Reno), North Carolina (Carteret, Gaston, Craven and Yadkin Counties), Ohio (Franklin, Lucas, Cuyahoga, Summit and Auglaize Counties), Pennsylvania (Philadelphia, Beaver and Berks Counties), South Carolina (Charleston), Virginia (Halifax and Prince William Counties),

Washington (King, Snohomish and Spokane Counties), and Wisconsin (Milwaukee) (Windham, B 002).

Select Comments on Vote Technology Design

(Submitters' comments generally did not exhibit concerns reflecting directly on the process of technology development as such. From a quality standpoint, technology planning must take a point of view of managing information as a resource. Information is among the most critical resources for any enterprise, and quality vote results are even more important to the functioning of a democratic society. Managing information quality entails understanding systems and applications as tools on an assembly line, used to produce a product [information/vote results], and as being integrated on the basis of how well they meet downstream customer requirements for the product, not the local requirements of particular subprocesses or the internal stakeholders who are the immediate beneficiaries of a particular technology. Quality-managed technology planning focuses on *reengineering* the information production process as a whole prior to *automating* it, thereby eliminating cost-adding efforts necessitated by failures to produce a quality product, as well as process steps that introduce error.)

Ted Selker stated that technological improvements must be implemented in a controlled way (Selker, T 001 p. 2). He asked whether HAVA funds should be used to buy machines rather than for research in how to improve them and the processes that use them (Selker, T 001 p. 3).

Charles Corry stated that members of NASED, which presently oversees testing of voting technology, do not have technical or engineering training or experience, that independent testing authorities are paid by voting technology vendors, and standards do not exist regarding what must be tested or how, and that untested and uncertified software is often used on voting technology actively being used (Corry, C 004). Submitters advised against relying on advice of technology vendors and not independent experts (Herrnson, P 005 sl. 4; Waymack, J 001; Waymack, J 002).

End customer spokespersons and design researchers both expressed concern for allowing the use of voting and tabulating devices that can be tampered with without detection (Moss, B 001 pp. 21-22; Herrnson, P 007 p. 4; Herrnson, P 009 p. 4; Selker, T 001 pp. 3, 5, 6-7; Selker, T pp. 3, 4-5). Ted Selker outlined a series of threats for voting processes to defend themselves against, including sophisticated hackers obtaining code and penetrating systems (Selker, T 005 p. 3), producers of voting systems inserting malicious code (Selker, T 005 p. 4), messages over open lines between system components being penetrated (Selker, T 005 p. 4), voters attempting to vote more than once, or as another person, or trying to steal others' votes (Selker, T 005 pp. 4-5), and malicious revotes by means of changing the system time on a voting machine (Selker, T 001 p. 5).

Ted Selker asked how we can prove the selections voters make through a computer interface are reflected accurately in voting machine records, as well as how we can know that a vote has been collected without the computer program tampering with it (Selker, T 001 p. 3).

Joseph Waymack expressed a concern for processes that lack a disaster recovery plan, suggesting the use of voter-verified paper ballots (Waymack, J 001).

Ballot Design

Submitters identified ballot misdesign as a concern (Ananda, R 001 pp. 1, 2), noting cases where absentee ballots bore candidate lists that did not correlate with the correct punch holes in the voting device (Ananda, R 001 pp 6, 7; Fitrakis, B 001 p. 3; Moss, B 001 pp. 24-25). Paul Herrnson and Ted Selker stated that defects in ballot design can affect election outcomes (Herrnson, P 001 pp. 1, 2; Herrnson, P 004; Herrnson, P 007 pp. 2-3; Selker, T 001 p. 3).

Paul Herrnson indicated that human factors and usability problems could impact voting technologies and ballot forms and may affect accuracy in recording voters' intent (Herrnson, P 004; Herrnson, P 009 p. 31), proposing that usability is at least as much a threat to election integrity as security (Herrnson, P 009 p. 4).

Submitters stated that usability was impacted by a focus on security and by economics (Herrnson, P 005 sl. 4), and that new features, social pressure, disability, age, education, willingness to use electronic technology, and socioeconomic status could all affect the usability of electronic voting systems (Herrnson, P 005 sl. 2; Herrnson, P 006, pp 3-4).

An analysis of the Unilect Patriot system found such issues as confusing, unclear and undocumented interface and navigational messages (Mercuri, R 001, pp. 8, 20, 22; Mercuri, R 002 p. 4; Mercuri, R 003 pp. 4, 5), a confusing straight-party vote deselect function (Mercuri, R 001 pp. 9-11, 22); Mercuri, R 001 p. 5), changes occurring on electronic ballot pages not currently being viewed by the voter (Mercuri, R 001 pp. 9-11), and confusing use of a button for provisional voting labeled for another function (Mercuri, R 001 p. 11). Herrnson found on a Diebold system that its function requiring the current vote to be deselected prior to changing the selected candidate was likely to be unclear to non-computer users, and in a test observed half of its users using the function correctly on the first try (Herrnson, P 009 pp. 24-31).

Ted Selker stated that users would generally prefer more iconographic information, such as political party pictures next to candidates, noting that election laws made this difficult (Selker, T 003 p. 9)

Submitters stated that many users do not review their ballots (Herrnson, P 009 p. 31) or they don't spend much time doing so (Selker, T 003 p. 9). Ted Selker stated that one in 10 voters informed of problems with their ballots were willing to vote again (Selker, T 001 p. 4). Rebecca Mercuri stated that the high undervote rate for counties in Pennsylvania that used the Unilect Patriot demonstrates voters do not necessarily make effective use of the system's review screen (Mercur, R 001 pp. 9-11). Ted Selker observed a tendency of voters not to choose to watch training videos (Selker, T 001 p. 4).

Roy Lipscomb stated that a voter's intent may be indeterminate if they make errors in producing their ballot, including casting too many votes in a contest (overvotes), failing to cast a vote in a contest (undervotes), marking the ballot ambiguously, entering write-in candidates illegibly, or marking the wrong box, then deciding not to correct the mistake (Lipscomb, R 001 p. 3).

Lipscomb observed that an internal computer copy of a voter's choices may deviate from the voter's intent, either due to hardware or software failure, tampering, operator error or electrical

disturbances (Lipscomb, R 001 p. 3), that systems that both create and deposit ballots can produce additional unauthorized ballots, and if a device controls the depositing or discarding of the ballot outside of public view, then voters may question whether the ballot was routed correctly (Lipscomb, R 001 p. 4).

Ted Selker observed that pre-scored punch cards that separate selections from descriptions showed the highest rate of missing presidential votes of any voting system in 2000, and stated that although hand counted ballots register few missing votes for president, they are widely thought to be the least accurately counted ballots available (Selker, T 003 pp. 1-2). Paul Herrnson cites punch card technology as registering unclear voter intent, paper ballots as subject to errors and difficult to process and interpret, and mechanical level technology as tending to break down, difficult to maintain, and difficult to store and transport (Herrnson, P 005 sl. 4).

Vote Technology Certification Observations

Federal-Level Observations

Procedures and methods for certifying voting systems for use are varied and lax (Mercuri, R 005)

States are buying systems that do not meet the requirements of HAVA Section 301 because HAVA has not yet gone into effect. States are implementing voting systems based on NASED qualification, which has nothing to do with HAVA funds (Pynchon, S 001)

Brian Hancock, ITA Secretariat for NASED, said he is not concerned about error rates because HAVA has not gone into effect yet. By similar reasoning, States can buy systems with unacceptable error rates. However on January 1, 2006, all these systems will then have to meet HAVA requirements, and they will either have to be "grandfathered in" or the States will have to give back millions in HAVA funding (Pynchon, S 001)

States can buy systems that do not meet HAVA requirements for disabled accessibility. However on January 1, 2006, all these systems will then have to meet HAVA requirements, and they will either have to be "grandfathered in" or the States will have to give back millions in HAVA funding (Pynchon, S 001)

HAVA Section 301 requires that voting systems have a "manual audit capacity." This phrase has never been defined by NIST (Pynchon, S 001)

States are buying DRE's with no manual audit capabilities because "manual audit capacity" has never been defined. No one knows whether these systems meet HAVA requirements because this term has not been defined (Pynchon, S 001)

FEC specification on reliability is inadequate and machine vendors have no incentive to exceed the specification (Klein, S 001, pp. 1, 2-3)

Touchscreen DREs designed and tested to the FEC 1990 specification are likely to be vulnerable to electrostatic disruption, possibly including complete loss of recorded votes (Klein, S 001, p. 5)

Uncertainty related to votes tabulated on DREs is greater than the uncertainty in a pre-election or exit poll of 1000 people (Klein, S 001, p. 1)

Presidentially-appointed EAC oversees Technical Guidelines Development Committee, Standards Board and making provisions for "testing, certification, decertification, and recertification of voting system hardware and software by accredited laboratories (Mercuri, R 004)

Election Assistance Commission (EAC) Technical Guidelines Development Committee (TGDC) were able to block or weaken efforts to close known vulnerabilities in existing voting equipment on the grounds that mandatory correction would require equipment to be replaced, creating problems in the conduct of upcoming elections (Klein, S 001, pp. 1-2)

Technical Guidelines were not available before state implementation plans were due, so 9 states requested HAVA extensions and many others contracted to purchase voting systems that are not HAVA compliant, since there are no official HAVA standards (Mercuri, R 004)

Voting systems are currently certified under a system established by the Federal Election Commission (FEC) and the National Association of State Election Directors (NASED). This certification is based on the 2002 FEC guidelines that were only adopted by 37 of the states and have been criticized by technologists as flawed (Mercuri, R 004)

Some problems with the FEC standard include the lack of a requirement that vote tallies be independently auditable, the allowance of trade-secret code that may not be able to be inspected should an election contest question the proper functionality of a voting system, and the use of commercial software products in balloting and tabulation systems without any inspection at all (Mercuri, R 004)

Early in 2004, NIST announced it had to curtail work on HAVA due to Federal budget cuts (Mercuri, R 004)

IEEE Project P1583 for a technical standard of requirements and evaluation methods for election voting equipment will provide detail necessary for increased assurances of voting product accessibility, accuracy, confidentiality, reliability, security and usability (Mercuri, R 004)

Many anomalies, especially with touchscreen DRE's, are consistent with the possibility that they are caused by effects of electrostatic discharge (ESD). This is an issue that has been ignored or at best inadequately addressed (Klein, S 001, p. 1)

Other Observations

Voting machine designs certified by private consulting firms that refuse to disclose their testing procedures (Windham, B 005)

No credible, independent audit of machines (Fitrakis, B 003; Thayre, H 001, p. 3); Voting machines not independently tested (Corry, C 004); Voting machine certification meaningless (Corry, C 004); Logic and accuracy testing is a farce (Corry, C 004)

Certification of voting machines only applies to the system itself (Windham, B 005)

When additional state certification inspection has been performed, there may be no guarantee that any particular system has been appropriately configured prior to deployment (Mercuri, R 004)

Testing is usually inadequate since each polling place is set up differently (Forrest, K 001 pp 9-10)

High speed ballot scanners harder to test since they are used to count votes for any precinct (Forrest, K 001 p. 7)

Smartcard voting subverts testing (Forrest, K 001 pp 9-10)

Few of the systems have been independently tested for voter usability issues (Herrnson, P 006)

There is little solid information overall about the interface between voters, various voting systems, and ballots (Herrnson, P 007)

Major problems still occur in voting equipment, training of poll workers, and ballot design (Herrnson, P 007)

Machines using outdated software (Waymack, J 001)

Vote machines often misprogrammed for given election (Corry, C 004)

A paramount concern in elections is how to regularly ensure that the vote count is accurate (Lipscomb, R 001 p. 1)

Most voting systems commonly offer "assurances" of accuracy, and ask for our "trust." But this evades the issue: Vote counts will remain controversial as long as "proof" is absent (Lipscomb, R 001 p. 1)

A test by the American Federation of the Blind of 5 DRE systems found most blind and visually impaired voters need some assistance with DREs (Pynchon, S 002)

A woman with severe vision impairment tested voting machines at the annual Supervisor of Elections statewide conference, and took 9 minutes to vote on the AutoMark and 31 minutes to vote on the Diebold. She liked the AutoMark immensely and didn't like the Diebold (Pynchon, S 002)

2.2. VOTER ENGAGEMENT, REGISTRATION, ACCESS AND VERIFICATION

2.2.1. VOTER ENGAGEMENT AND REGISTRATION

These processes encourage citizens to participate in the political processes as active, voting citizens, and register citizens so they have the legal capability to vote.

2.2.1.1. Findings

Voice of Election Customers

Submitters reported widespread difficulties with the process of citizens registering to vote and having their registration correctly processed and recorded. Hundreds of thousands of voters were projected to have experienced registration problems in Massachusetts (Martinez, J 001 pp. 10-11), based on a study that found one out of ten eligible voters observed at the polls having a significant problem with their voter registration preventing their first attempt at voting (Martinez, J 001 p. 8). Thousands of voters were reported to have been registered to vote in a timely manner, but never received their voter registration cards (Fitrakis, B 001 pp. 1-2), and many thousands were said to have experienced "botched" registrations (Moss, B 001 p. 25). Bill Moss and Rady Ananda noted irregularities in the registration process that resulted in voters receiving no notification that their registration was challenged (Moss, B 001 p. 26; Ananda, R 001 p. 7).

Several presenters noted that thousands of former felons were given incorrect information concerning their eligibility to vote (Fitrakis, B 001pp. 1-2; Ananda, R 001 p. 2). These reports involved not only currently convicted felons, but also those who had served their sentences and citizens who had been charged with felonies but only were convicted of misdemeanors (Fitrakis, B 001pp. 1-2; Ananda, R 001 p. 7). In at least once county there were reports of felons being told that they needed the signature of a judge in order to be allowed to vote (Ananda, R 001 p. 7).

Other reports were made involving the processing of voter registrations. One presenter noted that thousands of voters were changed from active to inactive status though not required by state law (Fitrakis, B 001pp. 1-2). In other areas, high percentages of voter registration were noted, but most of the citizens were reported as having never voted and with no signature on file for them (Ananda, R 001 p. 9). There were numerous reports of "unusual" and "unlikely" registrations (Ananda, R 001 p. 9), as well as many alleged cases of voter registrations being "tossed" [(Ananda, R 001 pp. 1 and 6 (Cuyahoga); Ananda, R 001 p. 2 (Franklin); Ananda, R 001 p. 2 (Hamilton); Ananda, R 001 p. 2 and 7 (Jefferson)]. A Secretary of State was reported to have enforced a very old law requiring a certain weight of paper to be used in order for voters' registration forms to be considered for processing (Fitrakis, B 001pp. 1-2). This same presenter noted that private companies were processing voter registrations and that some of these companies were politically connected (Fitrakis, B 001pp. 1-2). Concern was expressed that record voter registration efforts by one party were not at all reflected in the election results (Windham, B 005).

Difficulties with voter registration for students were reported as being hard to track because the Election Incident Reporting System had no search feature for student-related problems (Windham, B 001). Systematic suppression of the student vote was reported (Windham, B 001), with many students being allegedly being forced to travel to county election offices to verify their registrations (Ananda, R 001 p. 7). In one area, it was said that students at a certain college were

rejected from voting, while students at a nearby university were permitted to vote (Ananda, R 001 p. 8).

David Cobb stated that voting problems lead many Americans to believe that voting is irrelevant, and that others are disaffected and do not vote (Cobb, D 001 p. 1-2).

Submitters reported widespread voter registration database errors and confusion in polling location (Test, C 001). Forty-three states were said to have no method available for voters to correct errors in their registration on Election Day, which may result in the loss of the voters' opportunity to vote in that election (Martinez, J 001 p. 5). Many voters who had not changed their address for purposes of voter registration were allegedly told they were not on the list of registered voters at the poll where they normally vote (Martinez, J 001 p. 11). In one county, a precinct judge was reported as questioning every voter about his or her address (Moss, B 001 p. 26; Ananda, R 001 p. 7). There were numerous reports of missing registration records and what may have been deliberate misinformation regarding polling locations (Fitrakis, B 003, Moss, B 001 p. 25). Minority voters in numerous states were allegedly being targeted for eligibility problems related to voter registration (Martinez, J 001 p. 11), and voters who registered to vote through certain political parties or civil rights groups were reported as being told they could not vote (Moss, B 001 p. 26). Reports indicated that in one county, members of a certain political party were challenged as to their eligibility (Ananda, R 001 p. 7), and in other areas members of the same party were said to have been sent to wrong polling locations (Ananda, R 001 p. 6-7).

2.2.2. VOTER REGISTRATION MANAGEMENT

This process maintains and secures the list of registered voters and keeps the list current as registered voters may change addresses and / or names. The objective is to assure accuracy of the voter information and the jurisdictions in which they are eligible to vote.

2.2.2.1. Findings

Voice of Election Customers

Submitters noted numerous problems that reflect on management of voter registration. These include voter database errors (Test, C 001) and various issues related to inefficient processing of voter registration, such as many instances of voter registration cards not received by voters who registered on time (Fitrakis, B 001 p. 1), voter registration forms returned on the basis of their being submitted on the wrong weight paper (Fitrakis, B 001 p. 1), inability to correct registration errors (Martinez, J 001 pp. 5, 8; Healy, S 001 p. 1), large numbers of voter registration forms not being processed (Windham, B 001; Martinez, J 001 p. 11), voter registration information changed without notice (Windham, B 001), significant increases in voters being moved from active to inactive status (Fitrakis, B 001 p. 1-2), and large-scale disenfranchisement of citizens incorrectly identified as felons (Fitrakis, B 001 p. 1; Healy, S. 001 p. 2).

Numerous cases were cited of incorrect voter eligibility information being provided, such as information regarding felon eligibility (Fitrakis, B 001 p. 1) and legal voting addresses for purposes of residency (Windham, B 001), and listings of registered voters (Martinez, J 001 p. 10). Out-of-date polling books were reportedly used in Franklin County, Ohio (Fitrakis, B 001 p. 3).

Submitters identified concerns regarding private companies being used to process voter registrations (Fitrakis, B 001 p. 3; Healy, S 001 p. 2), unobservable voter list management services and inappropriate handling of private voter information (Merel, S 001 p. 7; Healy, S 001 pp. 1-3), and civic government functions being combined with military interests (Healy, S 001 p. 2).

We received numerous reports of eligible voters being discouraged from registering, in particular college students in numerous States (Windham, B 001). Submitters noted inadequacies in provisional ballot processing including their being of limited benefit in cases of registration issues (Martinez, J 001 p. 9) and large numbers of provisional ballots incorrectly invalidated based on registration information (Moss, B 001 p. 24). Other issues included inappropriate questioning of voters' addresses (Moss, B 001 p. 25) and deceptive registration of students under a particular party (Windham, B 001).

2.2.3. VOTER ACCESS

This process provides voters information and easy access to the location where they may vote.

2.2.3.1. Findings

Voice of Election Customers

The submitters identified a number of issues affecting voters' access to the polling place. There were reports of election administrative problems in that informational websites were out of date (Fitrakis, B 001 p. 3). Out-of-date voter sign-in books were reported at the polling place, resulting in provisional voting or not voting at all for some people (Phillips, R pp. 3-4; Windham, B 002).

Submitters cited polling place changes as an issue. Long time residents reported being turned away from their usual and correct polling places (Phillips, R 004 p. 4; Fitrakis, B 001 p. 3; Merel, S 001 p. 7). There were reports of polling places being changed without adequate notice to voters (Fitrakis, B 001 p.3; Phillips, R 004 p. 3; Windham, B 002; Moss, B 001 p. 24). Polling places were changed for security rationales (Fitrakis, B 001 p. 5) or were changed to locations considered dangerous or inconvenient (Phillips, R 004 p. 3). Some voters believed their polling place was illogically assigned (Fitrakis, B 001 p. 3).

It was reported that some polling places ran out of ballots and turned voters away without voting (Phillips, R 004 pp. 3-4). Polling places had problems with lack of voting machines or supplies, making voting difficult or impossible (Phillips, R 004 p. 4; Windham, B 001-003; Moss, B 001 p. 24). Some voters reportedly found their polling places opened late, causing voters on their way to work to leave without voting (Phillips, R 004 p. 4). Other polls were reported to have closed early, also causing voters to be unable to vote (Windham, B 002).

Submitters received complaints that provisional voting rules were changed from previous practice, causing confusion (Fitrakis, B 001 p. 3). Voter registration problems and manipulation were also reported (Fitrakis, B 001 pp. 3, 4, 6; Windham, B 001; Moss, B 001 p. 24; Martinez, J 001 p. 11).

Voters were reported to have been turned away without voting at polling places for various reasons. Some were denied the opportunity to cast a provisional ballot unless they were in the correct precinct (Fitrakis, B 001 p. 3; Phillips, R 004 p. 4; Moss, B 001 pp. 24, 26; Martinez, J 001 p. 6) Voters were turned away though they had provided proof of residency (Windham, B 001; Moss, B 001 p. 24; Martinez, J 001 p. 6). It was reported that some voters were turned away at multiple polling places, finally failing to vote (Phillips, R 004 p. 3).

Voters were reportedly sent to incorrect polling places and forced to vote provisionally (Fitrakis, B 001 pp. 3, 5; Phillips, R 004 p. 4; Windham, B 001-003; Martinez, J 001 pp. 11, 17). Some voters were sent to multiple polling places, discouraging their voting (Fitrakis, B 001 p. 5; Phillips, R 004 p. 4; Windham, B 001; Martinez, J 001 pp. 14, 17). Submitters reported voters being sent home to get their voting card in order to identify their correct precinct (Phillips, R 004 p. 3).

Confusion was reported at some polling places (Fitrakis, B 001 p. 3; Phillips, R 004 p. 4; Windham, B 002-003; Martinez, J 001 p. 17). Some of this confusion was attributed to multiple precincts located at the same polling place that were not clearly marked, resulting in some people voting at the wrong precinct (Fitrakis, B 001 p.3, Phillips, R 004 pp. 3-5).

Voters were reported encountering difficulty in filling out their ballots (Phillips, R 004 p. 4). Other reports cited pollworkers providing misinformation to voters or being rude (Phillips, R 004 p. 4; Windham, B 001-003' Moss, B 001 p. 25).

We received reports of barriers imposed on handicapped voters such as denial of curbside voting and lack of accommodations (Fitrakis, B 001 pp. 3, 5; Martinez, J 001 p. 17). Submitters stated that rides to polling places being refused to minority voters (Windham, B 001; Martinez, J 001 p. 6).

Long lines at polling places made it difficult for people to vote and resulted in some departing without voting (Fitrakis, B 001 p. 3; Phillips, R 004 p. 4; Windham, B 001-002; Martinez, J 001 p. 14). Voters were reported as being discouraged from voting by lines being deliberately kept under sun exposure (Windham, B 001). It was noted that photographs and videos were taken of voters, making some uncomfortable (Phillips, R 004 p.3).

Submitters presented numerous reports of voter intimidation and malfeasance (Fitrakis, B 001 pp. 3, 4, 6; Windham, B 001-003; Moss, B 001 p. 24). Intimidating leaflets and phone calls were cited (Fitrakis, B 001 p. 6, Moss, B 001 p. 24). Submitters reported intimidating behavior by police and security personnel, including ticketing and towing of voters' automobiles (Fitrakis, B 001 p. 4, Windham, B 001).

2.2.4. VOTER VERIFICATION

The processes of assuring that prospective voters are eligible to vote on Election day or for the manner in which they cast their vote, such as provisional or absentee.

2.2.4.1. Findings

Voice of Election Customers

A number of issues identified by submitters impacted on voter verification. These included large scale registration failures (Moss, B 001 p. 25) and challenges to absentee ballot requests (Fitrakis, B 001 p. 2), as well as registrations challenged with inadequate notification (Moss, B 001 p. 25). Submitters also reported instances of large numbers of provisional ballots invalidated on the basis of voters having not registered or having voted at the wrong precinct (Moss, B 001 pp. 25, 27), including by change of policy at short notice (Fitrakis, B 001 p. 2). Incidents of uncounted and unaccounted for provisional ballots were characterized as a tool for disenfranchisement (Merel, S 001 p. 7). Poll workers were noted as being unfamiliar with provisional voting rules (Fitrakis, B 001 p. 3).

Other problems affecting voter verification included misdirecting voters to incorrect polling places (Fitrakis, B 001 pp. 3, 5; Moss, B 001 pp. 24, 25; Windham, B 003), inadequately marked polling places with multiple precincts (Fitrakis, B 001 p. 3), the use of out-of-date polling books or data sources on official information websites (Fitrakis, B 001 p. 3), challengers in the polling place (Fitrakis, B 001 p. 5; Moss, B 001 p. 25), fraudulent voting by forged signature (Moss, B 001 p. 26) and malfeasance of poll workers in rejecting ballots (Windham, B 003).

Issues affecting voter verification were observed in relation to student voters, including absentee ballots not received by qualified voters, registered voters not found on voter lists at polling places, voters denied provisional ballots, deceptive registration practices bringing about address changes and switches of party affiliation, voters notified that they had been sent early voting ballots when they had not requested one, long lines of voters notified late in the day that they were at the wrong voting place, first time voters disallowed absentee ballots, registrations invalidated without notice, and apparent racial discrimination (Windham, B 001).

Internet and absentee voting were noted as rendering voter verification insecure (Mercuri, R 004).

2.3. CANDIDATE BALLOT ACCESS

2.3.1. BALLOT ACCESS BY PROSPECTIVE CANDIDATES

This process defines the requirements citizens who desire to run for office must meet to be placed on a ballot within the specific electoral jurisdictions.

2.3.1.1. Findings

Voice of Election Customers

Submitters expressed concerns about voters being restricted from voting for minor party and independent nominees. A lack of choice of candidates was cited as a problem in many states (Winger, R 001 p. 1), and candidate rights were described as the flip side of voter rights (Amato, T 001 p. 1). Theresa Amato called this condition a wide choice of a limited supply from two increasingly-converging parties (Amato, T 001 p. 1).

Richard Winger observed that no minor party candidate has qualified for the US House in GA since 1942; only 1 minor party nominee for US Senate has qualified in AK since 1936; Oklahoma voters could only vote for Bush or Kerry in 2004; and only Republicans and Democrats have qualified as political parties in NJ since 1920 (Winger, R 001 p. 1).

Theresa Amato cited a need for state and county ballot access reform and declared that independent and third party candidates are barred from competing in the electoral process (Amato, T 001 p. 4). State laws were identified as making it difficult to run candidates even for major parties (Winger, R 001 p. 1). A lack of uniform standards for independent candidates getting on the ballot was observed (Curtis, L 001). Unworkable requirements for petitions for vice presidential candidates and confusing state procedures for naming and selecting electors were noted (Amato, T 001 p. 1). Amato also pointed at a lack of integrated state voter databases (Amato, T 001 p. 3).

The election process and ballot access were likened to circumstances in countries where a single party is in control of the state (Amato, T 001 p. 1). It was noted that petitioning is a Constitutional right and that the First Amendment applies to public forums (Amato, T 001 p. 3). Conditions wherein volunteers are unable to gather signatures on petitions were cited, and petitioners were described as having an almost illegal status in what should be a right to petition the government (Curtis, L 001). Texas was mentioned as being known by ballot experts as one of the "bear" states (Curtis, L 001).

It was observed that the Constitution does not enshrine the two current major political parties (Amato, T 001 p. 1) and that the United States keeping parties and candidates off ballots is a bad example to the world (Winger, R 001 p. 1). The disenfranchisement of independent voters was compared with that of African-Americans in the South in the 1950s (Curtis, L 001).

2.4. ELECTION PREPARATION, CONDUCT AND CHAIN OF CUSTODY

2.4.1. ELECTION PREPARATION

The processes of planning and preparing for an election, including voting process (and technology) planning, pre-election planning, ballot design and testing, poll worker training, citizen training, among others.

2.4.1.1. Findings

Voice of Election Customers

Concerns related to preparation for elections included many reports of registration errors preventing voters from voting (Martinez, J 001 pp. 5, 8, 10, 11, 15; Moss, B 001 pp. 24, 25, 26; Phillips, R 001 pp. 1-2; Selker, T 001 p. 3; Test, C 001; Waymack, J 001). Problems with designation of precincts were reported (Moss, B 001 pp. 24, 25; Phillips, R 001 pp. 1, 2; Test, C 001), as well as incorrect notifications that polling places had been changed (Moss, B 001 p. 25). An issue regarding equitable assignment of voting machines to precincts was reported for Franklin, Knox, Hamilton, and Lucas counties in Ohio (Moss, B 001 pp. 25, 26; Phillips, R 001 p. 1).

Issues were noted with improperly discarded ballots (Moss, B 001 pp. 24-25), not placing ballots in secure locations and running out of ballots and turning voters away (Phillips, R 001 pp. 1-2), ballots without sleeves allowing pollworkers to view them (Phillips, R 001 pp. 1-2), cases of denying the right to cast a provisional ballot and have it counted (Martinez, J 001 pp. 9, 13, 15; Moss, B 001 pp. 24, 25, 27; Test, C 001), and problems with the use of absentee ballots (Moss, B 001 pp. 24-25, 26; Waymack, J 001).

Inadequate pollworker training was cited (Herrnson, P 007 pp. 2-3; Martinez, J 001 pp. 5, 8, 9, 13, 14, 15; Waymack, J 001), as well as dangerous polling locations (Phillips, R 001 pp. 1-2) and lack of privacy for voting (Phillips, R 001 pp. 1-2).

Concerns pertaining to technology planning included relying on the advice of technology vendors and not independent experts (Herrnson, P 005 sl. 4; Waymack, J 001; Waymack, J 002), logic and accuracy tests not including setting the system date to election day (Moss, B 001 pp. 21-22), ballots with varying candidate name sequences inserted into incorrect machines (Phillips, R 001 p. 2), voters being instructed to vote with a pen that the optical scanner might not read (Phillips, R 001 pp. 1-2), and vote machines with inadequate vote storage capacity (Mercuri, R 001 p. 20). Joseph Waymack noted a lack of disaster recovery plans through the use of voter verified paper ballots (Waymack, J 001).

Cynthia Test commented that laws were written for contesting paper elections, not electronic (Test, C 001). Ted Selker cited the need for technological improvements to be implemented in a controlled way (Selker, T 001 p. 2) and posed the question whether HAVA funds should be used to research how to improve voting machines and the processes that use them (Selker, T 002 p. 3).

2.4.2. ELECTION DAY VOTING

The process in which a voter casts his or her vote on Election Day. This process varies based on the voting technology and the processes designed in and controlled by regulations of the various jurisdictions. The objective is to assure that every person eligible to vote is able to cast their vote for the candidate or choice accurately as they intended.

2.4.2.1. Findings

Voice of Election Customers

Submitters reported numerous problems with election day voting. Voter registration problems were the major reason cited for citizens not being able to vote on election day, ranging from voters impeded by failing to report changes of address to the Registrar of Voters (Martinez, J 001 p.11), to voter lists not being kept updated (Phillips, R 008 p. 8), voters not being able to correct errors in their registrations (Martinez, J 001 pp. 5, 11) and names being wrongly removed (Phillips, R 001 pp. 1-2).

The process of voting was not always as positive an experience as it could be. Voters were reported to have encountered difficulty locating the polling place, with comments such as: incorrect locations given by officials or others (Fitrakis, B 001 p. 3; Phillips, R 004 p. 4); illogically assigned locations (Fitrakis, B 001 p. 3; Phillips, R 008 p. 8); last-second location changes (Fitrakis, B 001 p. 5); dangerous locations (Phillips, R 001 pp. 1-2); and lack of clear marking (Phillips, R 004 pp. 4-5; Phillips, R 008 p. 8).

Other issues arose at the polling place, including out-of-date sign-in books (Fitrakis, B 001 p. 3), not enough voting machines (Fitrakis, B 001 p. 4), and machines locked away (Fitrakis, B 001 p. 5). Submitters reported long lines in certain precincts (Fitrakis, B 001 p. 4; Phillips, R 001 pp. 1-2; Phillips, R 004 p. 4; Phillips, R 006 p. 9; Phillips, R 008 p. 7), polling places opening late (Phillips, R 004 p. 4), lack of privacy in voting (Phillips, R 001 pp. 1-2, Phillips, R 004 pp. 4-5), pollworkers giving wrong instructions (Phillips, R 001 pp. 1-2; Martinez, J 001 pp. 5, 9) and polling places running out of ballots or pencils (Phillips, R 004 p. 4). Instances of pollworkers being rude were cited often (Phillips, R 004 p. 4, Moss, B 001 pp. 24-25, Martinez, J 001 p. 9). Lack of training of pollworkers (Martinez, J 001 p. 1) and the length of election day (Martinez, J 001 p. 9) were also reported as concerns affecting election day voting.

Election result patterns such as very high over- and under-vote rates at precincts (Phillips, R 006 pp. 6-7 and Phillips, R 008 p. 7) or uncounted over- and under-votes (Fitrakis, B 001 p.5; Phillips, R 004 p.5) could also indicate issues with election conduct.

Ballot problems were noted such as polling places running of ballots (Phillips, R 001 pp.1-2) to no privacy sleeves for the ballots (Phillips, R 001 pp.1-2). Submitters reported ballots being placed in the wrong ballot box (Phillips, R 006 p. 4) and ballots being hard to mark (Phillips, R 004 p. 4). Impacted punch card chads were reported in the machines (Phillips, R 008 p. 5). Issues regarding the handling of candidate name rotation on ballots (Phillips, R 001 p.2; Phillips, R 006 p.1) and prepunched ballots for the presidential candidate position (Fitrakis, B 001 p.4; Phillips, R 006 pp.1-2, 11) were also cited.

Concerns related to provisional ballots included that they were being offered unevenly (Fitrakis, B 001 p. 3; Martinez, J 001 p. 3) or unnecessarily (Fitrakis 001 p. 3; Phillips, R 004 p. 4). Some poll workers reportedly required provisional ballots even with valid ID (Phillips, R 004 pp. 3-5). Submitters reported provisional ballots not counted (Martinez, J 001 p. 26) or invalidated in large numbers (Moss, B 001 p. 24).

Submitters cited problems with absentee ballots such as names misaligned with voting devices (Moss, B 001 p.24) and candidate name(s) missing from the ballot (Moss, B 001 pp.24-25).

It was reported that in some instances the oversight of critical election materials was not verifiable (Fitrakis, B 001 p.5). Cases included the unguarded storage of voting machines at polling locations (Fitrakis, B 001 p. 5), an optical scanner left unguarded (Phillips, R 004 p.4), and casual and unsecured storage of ballots at polling places (Phillips, R 004 p. 5; Phillips, R 001 pp. 1-2; Martinez, J 001 p. 12).

Submitters cited concerns pertaining to government administration such as lack of funds for elections (Martinez, J 001 p.5) and an inconsistent application of standards (Martinez, J 001 p.1).

It was reported that limited English speaking voters experienced difficulty and demographic gaps between election staffers and voters were noted (Martinez, J 001 p. 9).

There were a few instances reported of election process observers not being admitted. International and local observers were reported as being excluded from polling places in one case (Fitrakis, B 001 p. 4; Phillips, R 006 pp.1-2), and in another, citizens were denied access to a locked down building where votes were being counted (Moss, B 001 p. 26).

Bernard Windham provided numerous citations describing irregularities affecting students' ability to vote in the following states: Alabama, Arizona, California, Colorado, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maryland, Michigan, Missouri, Mississippi, Nevada, New Jersey, North Carolina, New York, Ohio, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, Washington, and Wisconsin.

Issues with election day voting were noted in many different states, including long lines, registration problems, ballot problems, including provisional and absentee ballots, polling place problems,confusion regarding proper polling place, improper ID requirements, malfeasance, misinformation,voter suppression, voter intimidation, write-ins disqualified on a technicality (San Diego, CA) and machine failures of many kinds. These issues were identified in Alabama (Birmingham, Montgomery, Tuscaloosa, Mobile, Morgan, Limestone), Arizona (Maricopa, Pina), California (Los Angeles, Orange, Alameda, Riverside, Sacramento Napa), Colorado (Denver, El Paso, Adams, Arapahoe, Boulder, Jefferson, Larimer, Douglas, Park), Florida (Alachua, Brevard, Broward, Collier, Dade, Duval, Escambia Hillsboro, Lee, Leon, Orange, Palm Beach, Pasco, Pinellas, Sarasota, Volusia), Georgia (Beaufort, Clayton, Cobb, DeKalb, Douglas, Fulton, Gwinnett, Hancock, Liberty, Twiggs, Walker), Illinois, Indiana (Franklin, Hamilton, Lake, Marion, Monroe, St.Joseph, Tippaconoe), Iowa, Kentucky (Henry County), Louisiana, Maryland (Harford, Montgomery, Prince George), Michigan (Ganesee, Oakland, Wayne), Missouri (Jackson, St.Louis), Mississippi (Cass, Clay), Nevada (Las Vegas, Reno), New Mexico, North Carolina (Alamance Burke, Carteret, Craven, Durham, Forsyth, Gaston, Guilford, Mecklenberg, Wake,

Yadkin), Ohio (Auglaize, Butler, Cuyahoga, Delaware, Fairfield, Franklin, Greene Hamilton, Hocking, Knox, Lucas, Mahoning, Montgomery, Portage, Sandusky, Starke, Summit, GTrumbull), Oregon, Pennsylvania (Allegheny, Beaver, Berks, Bucks, Dauphin, Delaware, Lehigh, Mercer, Montgomery, Philadelphia), South Carolina (Berkeley, Charleston, Greenville, Lexington, Richland, Spartanburg, York), Virginia (Fairfax, Halifax, Prince William, Richmond), Washington (Clarke, King, Pierce, Snohomish, Spokane, Thurston, Yakima) and Wisconsin (Dane, LaCrosse, Milwaukee,Racine, Waukesha). (Windham, B 002)

Some submissions detailed instances of election official malfeasance, such as the discriminatory withholding of voting machines from certain polling places (Moss, B 001 p. 24). Another instance alleged official misconduct wherein a vote county building was locked down and citizens were prevented from observing the process on the basis of a homeland security alert (Fitrakis, B 001 p.4). There were also reports of voters allegedly receiving phone calls informing them incorrectly of changes in their polling place locations (Moss, B 001 p. 24).

Voter intimidation was cited deriving from heavy security at the provisional voting location (Fitrakis, B 001 p. 5). A physically intimidating voter challenger in the polling place was reported (Phillips, R 008 p.8), as well as police aggressively ticketing and towing cars at polling place locations (Fitrakis, B 001 p. 5). Challengers located within polling places (Fitrakis, B 002 p. 5) were cited as cases of voter suppression.

Lack of accommodations for disabled persons, including no provisions for curbside voting, was noted (Fitrakis, B 001 p. 4). Election day being a work day was cited as a problem for those who work a distance from their polling place, making it difficult to get there in time to vote (Martinez, J 001 p.13).

A number of the submissions mentioned broken and malfunctioning voting machines as major problems for voters on election day (Fitrakis, B 001 p. 4; Phillips, R 001 pp.1-2; Phillips, R pp. 4-5; Phillips, R 008 pp. 3, 8; Moss, B 001 p. 25; Martinez, J 001 p. 12). Vote hopping, or a vote cast for one candidate being recorded for another instead, was reported (Fitrakis, B 001 p. 4; Phillips, R 001 p. 2; Phillips, R 006 p. 9; Phillips, R 008 pp. 1-3, 8; Moss, B 001 p. 25). Reported received of a preselected vote or a default to vote for a certain candidate on some electronic voting machines (Phillips, R 008 pp. 1, 2, 8). There were reports of disappearing votes, votes that appeared not to register on the voting device, in some cases requiring repeated entry (Phillips, R 006 pp. 6, 7, 9; Phillips, R 008 pp. 3, 7). A report was received of a voting machine that registered 0 votes throughout the day as it was being used (Fitrakis, B 001 p. 5). There were numerous reports of electronic voting machines freezing up and becoming unusable (Fitrakis, B 001 p. 4; Phillips, R 001 p. 3, Phillips, R 008 p. 1; Moss, B 001 p. 25). Instances of punchcard ballots unable to be inserted correctly into voting machines were reported (Moss, B 001 p. 24-25).

Submitters reported votes not stored in voting machines and lost (Mercuri, R 001 p. 20). Issues were raised regarding electronic voting machines being incorrectly programmed eliciting concern as to whether voters' choices would be recorded as intended (Fitrakis, B 001 p. 4; Phillips, R 001 pp. 2-3; Phillips, R 006 p. 1; Phillips, R 008 p. 7; Moss, B 001 p. 25).

2.4.3. CHAIN OF CUSTODY

The process of assuring the physical security of the voting equipment and the ballots to assure that no tampering can occur that could alter the results of an election.

2.4.3.1. Findings

Voice of Election Customers

Electronic Technology

Submitters reported a variety of issues regarding the chain of custody for electronic voting technology. These included the lockdown of a vote counting center excluding public view (Moss, B 001 p. 27), unmonitored access to voting machines between the election and a recount (Ananda, R 001 pp. 6, 8, 10; Eaton, S 001 p.1; Fitrakis, B 001 p. 5; Thayre, H 001 p. 5), questionable chain of custody for media recording votes (Fitrakis, B 001 p. 4), no chain of custody available for voting machines at the close of polls (Fitrakis, B 001, p. 5; Fitrakis, B 003), and gaps in the chain of custody between the testing or placement of devices and the election itself (Fitrakis, B 001 p. 5; Thayre, H 001 p. 11)

Concerns were voiced regarding the use of technology that can be manipulated untraceably (Thayre, H 001 pp. 8, 9; Harris, B 001). The lack of a ballot that could be recounted was noted (Fitrakis, B 003). Other factors impeding monitoring of technology including lack of technical expertise of election officials, technical difficulties of observing or tracking software, restricted access to technology and cost factors (Thayre, H 001 p. 50.

Submitters reported several cases of interference in recount processes (Ananda, R 001 p. 5), including vendor representatives taking apart voting machines prior to a recount (Eaton, S 001 p. 1), counting machines replaced when a machine recount did not match the election result (Ananda, R 001 p. 8), vendor representatives providing "cheat sheets" to assure machine recounts would not differ from election counts (Eaton, S 001 p. 1) and tabulating software altered before a recount (Ananda, R 001 p. 6).

Numerous instances were noted of elections and technology vendor personnel having easy and unmonitored access to voting technology (Ananda, R 001 pp. 5, 6, 8, 10; Eaton, S 001 p. 1; Fitrakis, B 001 p. 5; Fitrakis, B 003; Moss, B 001 pp. 21, 25; Thayre, H 002 p. 3) and inappropriate reliance on technology vendor personnel (Ananda, R 001 p. 8; Eaton, S 001 p. 1).

We also received reports of election officials withdrawing or refusing to release voting records for public inspection (Fitrakis, B 001; Moss, B 001 p. 22). Cases of retribution against whistleblowers were also noted (Ananda, R 001 pp. 5, 7).

Paper Records

Issues related to chain of custody for paper records were also noted. These included questionable ballot security procedures and ballots left out in an unguarded building (Ananda, R 001 p. 6), ballots rejected by machines set aside without clear knowledge of their disposition (Martinez, J 001 p. 12) and data critical to recounting discarded (Ananda, R 001 p. 6). It was noted

that absentee, provisional and write-in ballots are counted out of the public eye, rendering security difficult (Forrest, K 001 p. 5), and absentee and mail-in ballots with party registration and precinct number on the outside enable partisan mishandling (Forrect, K 001 p. 6).

Ted Selker noted a variety of concerns regarding the use of paper records, including logistical difficulties of working with paper voting receipts while keeping them secure, counting, verifying and transporting them (Selker, T 001 pp. 4, 5). Selker noted that transporting physical ballots entails they can be mislaid or lost, noting cases of ballot box designs that allowed ballots to fall out, misplaced ballot boxes, and procedural errors due to fatigue or nervousness while using physical records (Selker, T 001 p. 5). He also noted instances where another set of punchcards was allegedly substituted for the originals, and indicated that ballot workers running punchcard reading machines could mishandle the punchcards (Selker, T 001 p. 5).

2.5. PROVISIONAL, EARLY, AND ABSENTEE VOTING

2.5.1. PROVISIONAL VOTING

This process enables prospective eligible voters the right to cast a conditional vote on Election day if they are not able to be verified as eligible voters when they come to the polls, votes that will be counted when they are determined to be eligible to vote.

2.5.1.1. Findings

Voice of Election Customers

Submitters indicated considerable confusion at polling places regarding provisional ballots, with poll workers not familiar with provisional voting rules (Fitrakis, B 001 pp. 2-3; Fitrakis, B 003; Martinez, J 001 p. 9; Waymack, J 001).

Submitters indicated that many voters voted provisionally who might not have needed to, as a result of missing registration records (Fitrakis, B 003), individuals and voting rights groups misdirecting voters to wrong polls (Fitrakis, B 001 pp 2-3; Fitrakis, B 003; Ananda, R 001 p. 6), changed precincts and out-of-date, incorrectly identified polling places on official election websites (Fitrakis, B 001 pp. 2-3), out of date polling books causing some registered for years to appear to be not registered (Fitrakis, B 001 pp 2-3), and polling places with long, unclearly marked lines for different precincts, causing some to stay with their original line and vote provisionally (Fitrakis, B 001 pp 2-3).

Numerous instances were cited where few provisional ballots were validated (Martinez, J 001 pp. 9, 15; Merel, S 001 p. 7), including cases where they were ruled invalid because voters allegedly were not registered (Fitrakis, B 003; Moss, B 001 p. 25; Merel, S 001p. 7) or voted in the wrong precinct (Moss, B 001 pp. 25, 27; Ananda, R 001 p. 10). Provisional ballots were also indicated as having been discarded on many occasions (Ananda, R 001 pp. 1,2,4,6,7,10; Merel, S 001 p. 7). Other instances were mentioned where provisional ballots were not offered (Martinez, J 001 p. 15), including when electronic ballot machines failed (Test, C 001). In one case, many students received challenges to the right to vote absentee, with a message that they might lose their right to vote if they did not answer the challenge (Fitrakis, B 001 pp. 2-3). Other voters were disallowed to vote provisionally if they were mistaken about where they are expected to cast their ballot, against previously established practice (Fitrakis, B 001 pp. 2-3; Moss, B 001 pp. 25, 27).

In a thorough analysis of troubling patterns of practice at one precinct in New Mexico, researchers reported the misuse of provisional ballots by feeding them into optiscan ballot boxes on election day, as part of a wide-ranging, diverse and interdependent set of irregularities (See Griscom, D 001 p. 2). Part of this pattern included provisional voters casting votes at the precinct who could have cast a vote elsewhere as well. The breakdown of votes among provisional ballots accepted by the County Recorder did not match the breakdown for the vote at the polling place.

Provisional ballots were described as being of limited help to voters whose problems are with registration or other procedural issues (Martinez, J 001 pp. 9, 15; Merel, S 001 p. 7).

2.5.2. EARLY VOTING

The process that enables registered voters to vote during a time period before Election Day.

2.5.2.1. Findings

Voice of Election Customers

It was observed that 20% of all votes are cast early or by absentee ballot (Landes, L 001).

One researcher reported that in the November 2004 election, roughly 2/3 of the absentee and 1/2 of the early voting third party votes registered on the straight party option in 86 precincts in Santa Fe, NM did not register a vote for the presidential candidate of that party (Alter, J 001 pp. 2-3).

Early voting was described in terms of its impact on the observability of election processes. It was noted that vote fraud by absentee ballots is difficult to detect (Landes, L 001). They were described as leaving election officials in control of ballots, free to destroy, alter or replace them, and as constituting a secret processing of the vote (Landes, L 001), handling ballots out of public view, in unauditable fashion (Forrest, K 001 p. 9). It was indicated that early voting provides no protection against vote selling or voter coercion (Forrest, K 001 p. 9).

Mail ballot sorting has been outsourced, placing it under the oversight of private firms operating outside of public view and becoming single point of failure (Forrest, K 001 p. 6).

2.5.3. ABSENTEE VOTING

The process that enables registered voters the ability to vote if they are physically unable to vote on Election day, such as being required to be out of the country, or physically disabled and not able to get to the voting location.

2.5.3.1. Findings

Voice of Election Customers

Various issues related to absentee voting were noted by submitters. It was observed that 20% of all votes are cast early or by absentee ballot (Landes, L 001).

One researcher reported that in the November 2004 election, roughly 2/3 of the absentee and 1/2 of the early voting third party votes registered on the straight party option in 86 precincts in Santa Fe, NM did not register a vote for the presidential candidate of that party (Alter, J 001 pp. 2-3). A study of poll books by Dr. Werner Lange in 106 precincts in Trumbull County, Ohio observed 580 absentee votes cast for which there was no notation of absentee voting in the poll books (Moss, B 001 p. 21). Irregularities in the use of absentee ballots were cited as affecting voting and rendering an erroneous or uncertain result (Moss, B 001 pp. 24-25).

Irregularities and problems with absentee ballots were reported in the following states: Alabama (Birmingham, Montgomery, Mobile), Arizona (Pima County), Colorado (Denver, and El Paso, Adams, Arapahoe, Jefferson, Boulder and Larimer Counties), Florida (Palm Beach, Broward, Miami/Dade, Hillsboro, Pinellas, Orange and Duval Counties), Georgia (Fulton and DeKalb Counties), Kentucky, Maryland (Montgomery County), Missouri, Nevada (Las Vegas and Reno), North Carolina (Mecklesburg, Wake and Durham Counties), Ohio (Franklin, Hamilton, Lucas, Mahoning, Montgomery, and Summit Counties), South Carolina (Richland, Spartanburg, York and Berkeley Counties and Charleston) Washington (King, Snohomish, Pierce, Spokane Counties), Wisconsin (Milwaukee) (Windham, B. 002; Windham, B 003).

Thousands of students registered to vote absentee in Franklin County, Ohio received challenge letters from the Republican Party, and were warned by the county Board of Elections that if they did not answer the challenges, they could lose their right to vote (Ananda, R 001 p. 7; Fitrakis, B 001 p. 3). The Franklin County Board of Elections called or wrote an undetermined number of voters who obtained absentee ballots, challenging their addresses (Fitrakis, B 001 p. 3).

We received reports of absentee ballots not received, including many reports of students in many states (Fitrakis, B 003; Windham, B 001). The disappearance of 58,000 absentee ballots en route to voters in Miami, Florida was noted (Merel, S 001 p. 7). The mailing of absentee ballots has been outsourced to private industry in King County, Washington (Landes, L 001). Returned absentee and mail ballot sorting have been outsourced as well, placing them under the oversight of private firms operating outside of public view and creating a single point of failure (Forrest, K 001 p. 6).

Issues with ballot design and voting technology were cited, including absentee forms in which the number to be punched did not correlate with the candidate's number in the printed list (Fitrakis, B 001 p. 3), and absentee ballots with arrows that did not align with the correct punch hole

(Ananda, R. 001 pp. 6,7; Moss, B 001 pp. 24-25). Some absentee ballots were found pre-punched for one candidate (Fitrakis, B 003).

Absentee ballots were described in terms of their impact on the observability of election processes. It was noted that vote fraud by absentee ballots is nearly impossible to detect (Landes, L 001). They were described as leaving election officials in control of ballots, free to destroy, alter or replace them, and as constituting a secret processing of the vote (Landes, L 001), allowing them to handle ballots out of public view, in unauditable fashion (Forrest, K 001 p. 9). It was indicated that absentee ballots provide no protection against vote selling or voter coercion (Forrest, K 001 p. 9).

2.6. COUNTING, RECOUNTING, AUDITING AND EXIT POLLING

2.6.1. VOTE COUNTING

The process of tabulating the results of voting. The objective is to assure that every eligible ballot is counted and that it is counted accurately.

2.6.1.1. Findings

Voice of Election Customers

Submitters reported a statistically significant discrepancy between national exit poll results and official vote results for the 2004 election (Dopp, K 001 pp. 3, 4-5; Dopp, K 002 p. 3; Mitteldorf, J 001 p. 1; Moss, B 001 pp. 18, 19-20; Simon, J 001 p. 7), noting that the pattern was concentrated in five states, four of which were key battleground states (Dopp, K 001 p. 5; Moss, B 001 p. 19). Submitters indicate this discrepancy has not been explained (Dopp, K 001 pp. 5, 22; Dopp, K 002 pp. 4, 11), and was attributed by the exit polling agency to defects in the exit polls, without considering errors in election results (Dopp, K 001 p. 5). Raw, unadjusted, precinct level data for the exit poll has not been made available (Dopp, K 001 p. 5; Dopp, K 002 p. 6). A discrepancy between national exit polls and the popular vote count was also reported (Simon, J 001 p. 2).

A discrepancy was also noted between the accuracy of the exit polls with respect to the presidential race and the accuracy of other races (Dopp, K 001 p. 16). Voting technologies other than paper ballots were associated with exit poll discrepancies (Dopp, K 001 p. 22), and the within-precinct error for paper ballots varied from that for all other technologies (Dopp, K 001 p. 18; Mitteldorf, J 001 p. 4).

A study of voting patterns in one New Mexico county reported significantly different vote results between absentee totals and early voting and election day totals (Alter, J 001 pp. 1-2; Alter, J 002 pp. 1-3). An analysis of statewide data reported high local variation with respect to undervotes, as correlated with ethnicity and paper ballots versus DREs (Dopp, K 003 pp. 1, 4).

Unusual vote results were reported in various locations (Ananda, R 001 pp. 5-10; Dopp K 004 p. 1; Moss, B 001 pp. 25, 26; Phillips, R 001) These included high undervote rates (Alter, J 002 pp. 1, 2-3; Ananda, R 001 pp. 8, 9, 10; Dopp, K 001 pp. 4, 19; Mercuri, R 001 pp. 14-15, 19, 20; Moss, B 001 pp 26-27; Phillips, R 001 pp. 2-3), including correlations with districts with large minority populations (Alter, J 002 p. 2; Dopp, K 003 p. 1) and higher undervote rates for DREs than for other systems (Dopp, K 001 p. 19; Dopp, K 003 pp. 1, 3; Mercuri, R 002 p. 4). A large number of uncounted ballots were observed in Ohio, concentrated in counties predominantly using punchcards (Phillips, R 001 p. 2; Phillips, R 005 pp. 1, 2-3, 12), and also in precinct voting predominantly for one candidate (Phillips, R 001 p. 2; Phillips, R 005 pp 2-3, 4-5, 6, 7, 9-10, 11, 12).

Other unusual vote patterns included high rates of absentee ballots not noted in absentee logbooks (Moss, B 001 p. 21; Ananda, R 001 p. 10), many fewer total ballots cast than roster signatures (Alter, J 002 p. 3) and many phantom votes (more votes cast than roster signatures) (Alter, J 001 pp. 1-2; Alter, J 002 p. 3), unusual patterns of voter turnout (Ananda, R 001 p. 9;

Dopp, K 001 p. 4; Moss, B 001 p. 26; Phillips, R 001 pp. 2, 3; Phillips, R 007 p. 1; Phillips, R 009 pp. 1, 8) and unusual patterns of voter registration (Phillips, R 001 p. 3; Phillips, R 009 pp. 1, 8; Dopp, K 001 p. 4).

Submitters reported a broad range of concerns affecting vote counting. Among these were irregularities in registration, designation of precincts and use of absentee ballots as well as improperly discarded ballots (Moss, B 001 pp. 24-25); lost, discarded, and improperly rejected registration forms and absentee ballots (Dopp, K 001 p. 4); denials of the right to cast provisional ballots and have them counted (Moss, B 001 pp. 24-25, 27), including large numbers of provisional ballots invalidated (Ananda, R 001 pp. 6, 7, 10; Moss, B 001 p. 25) in one case through a policy change regarding ballots cast at the wrong precinct, but in the right polling place (Moss, B 001 p. 27); large numbers of registrations invalidated (Ananda, R 001 pp. 6, 7) including voters falsely notified their registrations were invalid (Ananda, R 001 p. 8) and absentee ballots challenged (Ananda, R 001 p. 7). A case of ballots being left loose on tables in an unlocked, unguarded building was reported (Ananda, R 001 p. 7).

It was noted that votes of one type can easily "cancel out" undervotes in another unless they are reported broken out (i.e., election day, absentee, overseas, provisional, early voting, etc.) (Dopp, K 002 p. 12). In an analysis of troubling patterns of practice at one precinct in New Mexico, researchers reported a wide-ranging, diverse and interdependent set of irregularities apparently of this nature (See Griscom, D 001 p. 2). We received reports of phantom votes subtracted from undervote certified totals (Alter, J 001 pp 1-2; Alter, J 002 p. 3), and provisional ballots not reported separately, and added to absentee or early voting totals (Alter, J 002 p. 3; Dopp, K 002 p. 12).

Concern about security for absentee and mailed ballots, provisional ballots, and write-ins was expressed since these votes are often received and counted out of the public eye (Forrest, K 001 p. 5), and as a result abuses of the qualification process for these ballots would not come to light (Forrest, K 001 pp. 5-6).

We received reports of ballots being counted under "lockdown" in one Ohio county, excluding public observation, reportedly in response to a threat assessment (Ananda, R 001 p. 10; Moss, B 001 p. 27; Phillips, R 009 p. 1).

Cases were reported of ballots counted on machines they were not designed for, listing candidates in a different order (Phillips, R 001 p. 2; Phillips, R 006); votes on computer disks tabulated twice (Moss, B 001 p. 27); and additional votes added to totals after all precincts reported, showing no significant change in major candidate vote percentages, but producing a margin for one candidate of exactly 16,000 votes (Phillips, R 001 p. 2; Phillips, R 007 p. 1)

Defects associated with voting machines were reported that would affect vote counting (Moss, B 001 pp. 24-27; Phillips, R 001 pp. 1-3). Logic and accuracy tests were not conducted in many cases in Ohio (Ananda, R 001 pp. 5, 7-9) or were performed without setting the system date to election day to capture the possibility of code set to execute on that date (Moss, B 001 pp. 21-22). Logic and accuracy tests were described as inadequate to protect against all concerns (Harris, B 001 p. 21; Forrest, K 001 pp. 7, 9). Katherine Forrest observed that central high speed ballot scanners were hard to test because they count multiple precincts and are necessarily configured in a variety of ways (Forrest, K 001 p. 7).

We received reports of improper access to voting machines, including interference with machines (Ananda, R 001 pp. 6, 10), allegations of changing legitimate results through physical or electronic access to tabulating systems (Moss, B 001 p. 21), and improper access to and use of a central vote tabulation computer (Ananda, R 001 p. 5; Moss, B 001 p. 25).

Other concerns included machine shortages (Ananda, R 001 pp. 7, 8; Moss, B 001 pp. 24-25), machines counting votes for opponent candidates (Moss, B 001 pp. 26, 27; Phillips, R 001 pp. 2-3; Phillips, R 008 p. 1), going blank when selecting one candidate (Phillips, R 001 pp. 2-3), or programmed to default to one candidate unless the voter overrode the default (Phillips, R 001 pp. 2-3; Phillips, R 008 pp. 1, 2-3, 7). Cases of machines jamming, ballots that could not be inserted into machines and faulty vote cartridges were reported (Ananda, R 001 pp. 7-8).

Submitters expressed concerns about the election system losing transparency and accountability (Merel, S 001 p. 6), giving election officials power to suppress and distort vote counts (Dopp, K 001 p. 22). The system was characterized as having the appearance of being designed to ease the task of manipulating the outcome (Forrest, K 001 p. 3). Electronic voting machines were described as preventing transparency (Thayre, H 001 p. 5; Thayre, H 002 p. 1) and impeding multi-partisan observation of election procedures, including vote handling and vote counting (Thayre, H 002 p. 4).

Voting equipment was described as vulnerable to security breaches and issues affecting the accuracy of vote counts (Dopp, K 001 p. 22; Dopp K 004 p. 1; Dopp, K 006 p. 1). An investigation of one system described it as being designed for flexibility over security (Harris, B 001 p. 22). The inherent alterability of computers was noted (Lipscomb, R 001 p. 3). DREs were reported as being more susceptible to manipulation than optical scan and ballot marking and generating systems (Dopp, K 004 p. 1). Concerns were expressed for central tabulators using an operating system that made them vulnerable to entry and manipulation (Simon, J 001 p. 6), and for a particular system found to be susceptible to modifying results undetected (Mercuri, R 001 p. 22).

Submitters described election processes as having secrecy and invisibility being built into them, with invisible ballots, ballot counting, central tabulation and aggregation (Merel, S 001 p. 5). Concerns were expressed for lack of oversight over the internal working of electronic voting machines and systems (Thayre, H 001 p. 4), and the difficulty of detecting the effect of unauthorized operating instructions inserted into software (Moss, B 001 pp. 21-22).

The significant use of nonauditable vote recording and counting equipment was noted (Dopp, K 001 pp. 4, 22; Dopp, K 004 p. 1; Dopp, K 006 p. 1). A study of one system discovered that different machines could be programmed independently, and therefore provided no way to verify certified functionality across machines (Harris, B 001 pp. 8-9). It was noted that few legislative proposals require audits or hand counts (Thayre, H 001 pp. 3-4). It was observed that high speed ballot scanners tend to be hidden from public view, but are also vulnerable to errors and fraud (Forrest, K 001 p. 7).

It was stated that computerized voting equipment is susceptible to undetected errors, malicious coding, and fraud (Simon, J 001 p. 6; Simon, J 002 p. 2), as well as programming error and equipment malfunction (Dopp, K 001 p. 1; Dopp, K 006 p. 1). Submitters observed that code can display one thing on a screen, record something else, and print something else again (Merel, S

001 p. 5, quoting Mercuri, R); that a ballot stored in memory can differ from the one on the screen (Thayre, H 001 p. 6), and the computer's copy of a voter's choices can differ from those on a paper ballot received by a voter (Lipscomb, R 001 p. 4).

Bev Harris reported that the Diebold GEMS central tabulator can be penetrated to change vote data (Harris, B 001 pp. 4,5). The potential to use smartcards to dynamically change the functioning of voting machines was noted (Forrest, K 001 pp. 9-10; Harris, B 001 p. 2). Harris submitted a report demonstrating security flaws in a Diebold optical scanner that executes code on memory cards, allowing functionality to be modified on individual machines (Harris, B 001 pp. 8-9). She showed that the device does not provide protection against tampering with checksums, that it allows paper trail falsification, pre-loading votes and removing their traces, programming of functionality to be based on triggers such as time and date and number of votes (Harris, B 001 pp. 8-9), and that it can adjust its function based on voter input and can redistribute votes while maintaining an appearance of integrity (Harris, B pp. 19-20).

In another study, Michael Shamos reports on another system that allows administrators to skip the printing of a a zero tape signifying the initiating of vote capture (Mercuri, R 001 p. 22; Mercuri, R 002 p. 5). He also showed that malicious activities could be performed on the central computer while erasing the evidence (Mercuri, R 002 p. 4), that the system allows manual adjusting of vote totals without an adequate audit trail (Mercuri, R 001 p. 12; Mercuri, R 003 p. 5), and that the electronic log can be circumvented since it only tracks events performed in the voting software, not events occurring in the operating system, such as copying and deleting (Mercuri, R 002 pp. 4-5).

Submitters expressed concern that vote systems were being developed, provided and maintained primarily by a few private vendors (Dopp, K 001 p. 4; Merel, S 001 p. 2; Simon, J 001 pp. 5-6). It was reported that vendors have refused to allow candidates to examine and verify the software used to record and count votes, and that election officials are often contractually barred from examining it (Thayre, H 002 p. 3). It was also observed that court decisions have held against voting machines and their software being inspected by public election officials (Merel, S 001 p. 2). Concern was expressed for a lack of security screening for workers involved in vote processing, and the lack of a legislative requirement for this (Thayre, H 002 pp. 2-3).

It was reported that returned absentee and mail ballot sorting is being outsourced to private businesses, outside of public view and becoming a single point of failure (Forrest, K 001 p. 6). It was suggested that private exit pollsters might choose to adjust exit poll data to conform to official election results and neglect to release the raw data for review (Dopp, K 002 p. 12).

2.6.2. VOTE RECOUNTING AND AUDITING

Vote Recounting: The process of verifying whether the vote counting process was performed accurately in close races where there is a challenge.

Vote Auditing: The process of assuring the vote counting was conducted accurately as compared with the valid ballots cast. The objective is to assure the accuracy of the vote counting process.

2.6.2.1. Findings

Voice of Election Customers

Submitters expressed concern regarding the auditability of election results. Among circumstances reported were allegations that election results were changed on electronic vote tabulating machines without audit trails (Moss, B 001 p. 21) and a lawsuit brought by a candidate to investigate election problems that was reportedly blocked (Test, C 001). It was observed that HAVA requires federal election systems have a manual audit permanent paper record (Mercuri, R 001 p. 3) and it was stated that proposed legislation on electronic/computer voting does not have sufficient audit requirements (Thayre H 001 p. 4). Submitters reported an instance wherein a Secretary of State directed poll books be kept from public view and delayed their inspection until after election results were certified (Ananda, R 001 p.10; Moss, B 001 p. 20). One submitter stated that touchscreen DRE ballots, off-site central tabulations, audit trails and recounts are now invisible (Merel, S 001 p. 5).

An analysis of one system reported that it allows manual adjustment of vote totals without a sufficient audit trail (Mercuri, R 003 p. 5), provides no audit trail for provisional votes on the central counting device as required (Mercuri, R 001 p. 11), its precinct logs did not show provisional votes nor how many voters voted (Mercuri, R 001 p. 12), and was not adequately auditable since it could be manipulated through access to its electronic log by means of the operating system (Mercuri, R 002 pp. 4-5).

One submitter observed that a lack of a "None of the Above" option on ballots creates an audit problem for tracking lost votes (Mercuri, R 004).

A submitter stated that in the absence of audit procedures, exit polls are the most accurate resource for verifying election outcomes (Mark, J 001 p. 3). Another submitter stated that audit and recount provisions are inadequate and are a poor defence against vote result manipulation (Simon, J 002 pp. 4-5).

Submitters also expressed concerns regarding recounts. Jonathan Simon asserted that recount procedures were controlled by machine vendors to avoid full hand counts (Simon, J 002 p. 4). Problems observed included interference with voting machines prior to recount (Ananda, R 001 pp. 6, 7, 9, 10), including an affidavit from a Deputy Director in Ohio describing a vendor technician accessing and modifying a machine to be used in a recount (Eaton, S 001 p. 1), a counting machine replaced when its recount did not match the original results (Ananda, R 001 p. 9), critical records disposed of by elections staff prior to recount (Ananda, R 001 p. 10), and ballots left in unguarded, unlocked premises prior to recount (Ananda, R 001 p. 7).

It was stated that election conditions have caused disputed outcomes (Cobb, D 002 p. 1), that vote counts would remain controversial as long as election systems do not provide proof of their validity (Lipscomb, R 001 p. 1), and that uncertain election results indicate fraud (Moss, B 001 p. 26). David Cobb stated that inconclusive vote counts or recounts will prevent agreement on the outcomes of future federal elections and result in the loss of voter confidence (Cobb, D 001 p. 1).

A statistically significant discrepancy between the national exit poll results and official election results was cited, stating that the exit poll results were adjusted to match election results (Moss, B 001 p. 17), and observing that the variation between the two results was in favor of one candidate for 10 of 11 "battleground states" (Moss, B 001 p. 18).

Submitters reported unusual patterns in vote results (Ananda, R 001 p. 6), including roster counts inconsistent with the numbers of ballots cast (Alter, J 005 p. 3), large numbers of undervotes in the presidential race (Ananda, R 001 p. 9), votes that may have been shifted from one candidate to another (Phillips, R 009 p. 1), large numbers of lost votes and races undecided (Waymack, J 001), unlikely voter turnouts (Ananda, R 001 p. 9; Moss, B 001 p. 25), numbers of votes cast that appear unlikely given registration patterns (Griscom, D 001 p. 3), and vote patterns that diverge from presumable party behavior (Phillips, R 010 p. 1; Phillips, R 011 p. 1).

Numerous irregularities in voting processes were reported, including votes shifted from one candidate and added to another (Ananda, R 001 pp. 5-10; Moss, B 001 pp. 22, 23), ballots substituted for valid ones (Moss, B 001 p. 20), new votes added to totals after all precincts had reported (Ananda, R 001 p. 9; Phillips, R 007 p. 1), uncounted ballots (Ananda, R 001 p. 10; Phillips, R 005 p. 1), entire precincts omitted (Waymack, J 001), votes counted twice (Ananda, R 001 p. 9, Moss, B 001 p. 26), shortages of voting machines (Phillips, R 001 p. 1), provisional ballots lost or not counted (Merel, S 001 p. 7; Ananda, R 001 pp. 7, 9), provisional ballots placed in the ballot box in error (Griscom, D 001 pp. 1-2), absentee ballots cast without notations in logbooks (Ananda, R 001 p. 10), and systemic patterns suggesting intentional fraud (Griscom, D 003 p. 4)

Numerous machine failures were reported, including extremely large numbers of negative votes (Ananda, R 001 p. 8; Moss, B 001 p. 25), failures causing losses of large numbers of votes and double counted ballots (Moss, B 001 p. 25; Waymack, J 001; Waymack, J 002), more votes for the presidential race than were cast (Waymack, J 001), central tabulators counting backwards (Waymack, J 002), and high rates of undervotes (Mercuri, R 001 p. 19).

Other concerns identified by submitters related to auditing and recounting processes include lack of security screening for employees, election workers, technicians and voting machine vendors (Thayre, H 002 p. 2), questionable ballot security procedures (Ananda, R 001 p. 6), ballots counted in secret under "lockdown" due to reported threat assessment (Ananda, R 001 p. 10; Moss, B 001 p. 26), lax security procedures related to access to voting machines before, during and after elections (Thayre, H 002 p. 3), access to vote tabulating machines by vendors (Ananda, R 001 p. 5; Moss, B 001 p. 20), and votes missing after unsupervised access to voting machine by vendor technician (Waymack, J 001)

Submitters expressed concern for procedures that keep the public from scrutinizing election results (Test, C 001), and that have eliminated transparency and accountability (Merel, S 001 p. 7) and direct voter participation and oversight (Landes, L 001 p. 2).

Submitters report that provisional, mailed, absentee, and write-in ballots are often privately counted (Forrest, K 001 p. 5) and some absentee and mail ballot sorting is outsourced and privately operated.

Lynn Landes stated that vote manipulation is hard to detect with early or absentee voting or the use of voting machines (Landes, L 001 p. 8). Others identified concerns that electronic voting machines are impossible for the public to inspect functionally (Forrest, K 001 p. 8) and prevent citizens from knowing whether votes are entered or counted correctly (Thayre, H 002 p. 1), that DREs without voter verified paper ballots are not secure and not transparent to voters with respect to vote, tabulation or recount (Dopp K 004 p.1-2), that even with a paper trail DREs prevent observation and verification of vote handling and counting, allow undetectable fraud, and employ software that is often a trade secret that may not be examined by election officials (Thayre, H 002 pp 2-4). High-speed ballot counters were identified as often hidden from view and yet implying similar concerns, while also posing special difficulties in testing (Forrest, K 001 p. 7).

Submitters testified that early voting is susceptible to tampering (Thayre, H 002 p. 4), that electronic voting allows any input or output to be manipulated without detection (Merel, S 001 p. 5) and allows unrecognizable alteration of programs, ballots and tallies by persons in remote locations (Thayre, H 001 p. 8), that DREs can be programmed to respond to hidden triggers (Harris, B 001), and that technicians can use flash memory devices in the form of watches, pens and lighters to unnoticeably copy software and data (Thayre, H 002 p. 1). Heleni Thayre stated that election systems that allow tampering and prevent observation are illegitimate (Thayre, H 002 p. 4).

Ted Selker identified a variety of concerns regarding voter-verified paper records as they may impact election audits and recounts, in the areas of ergonomics, logistics, security and mechanical fragility. Ergonomics issues for poll workers include the fact that paper records may differ from their electronic records (Selker, T 001 pp. 2, 3-4, 5-6), and encouraging their use, keeping them secure, counting them, verifying their count against the number of votes in the electronic device, sealing and preparing them for transport, and transporting them may pose ergonomic problems and entail additional time and effort (Selker, T 001 pp. 3-4).

Logistics issues cited by Selker include collecting, organizing and transporting (Selker, T 001 pp. 2, 5), reading and reconciling with electronic tallies, guarding against the possibility of replacing one set of paper records with another, dealing with fatigue or nervousness, the fact that machine counting human readable ballots accurately will be harder, the question of which record should be trusted when a disparity is seen, the fact that if ballot workers know the paper records are not the primary ballot this will lead them to be less careful with them than with the electronic records, the fact that receipts printed on curled thin paper are difficult to count, hard to stack and organize, the fact that interpreting human readable words on a paper record will be more complex than automatically registering a hole or filled-in oval (Selker, T 001 p. 5). A malicious person could change the time on the voting machine and produce a new trail, putting into question which is correct (Selker, T 001 p. 5). Other logistical issues include difficulties with counting and illiteracy (Selker, T 001 pp 5-6).

Security issues include the fact that the paper record can be systematically misprinted in an undetectable way (Selker, T 001 pp. 2, 6-7), hand counting will not easily detect fraud (Selker, T 001 p. 2), and producing discrepancies between the electronic record and the paper one could be used to question the quality of the technology and call for a new election (Selker, T 001 p. 6). Mechanical fragility concerns include the possibilities of printer breakdowns or supplies running out (Selker, T 001 pp. 2, 7).

Selker stated that effective means for counting paper records for auditing purposes have not been established and they do not address existing sources of disenfranchisement (Selker, T 001 p. 2). He stated that voter-verified paper trails undermine public confidence in electronic voting systems and human observations of elections can cause inaccurate vote counts (Selker, T 004).

Other submitters indicate that a paper trail is worthless if it is not the original ballot record for a recount (Simon, J 002 p. 4), that "voter verified paper receipts" are usually not counted openly, if at all (Merel, S 001 p. 5) and unofficial paper records may be ineffective (Merel, S 001 p. 6).

Rebecca Mercuri observes that problems with FEC standards have led to voter-verified paper ballots in California elections (Mercuri, R 004). Joseph Waymack states that voter-verified paper ballots save lost votes and without them there is no disaster recovery plan for elections (Waymack, J 001). Michael Shamos indicates that HAVA does not require a voter-verified record (Mercuri, R 001 p. 17).

2.6.3. EXIT POLLING

The process used by independent parties who survey voters as they leave the polling station to seek to understand voter behavior and voter choices.

2.6.3.1. Findings

Voice of Election Customers

The 2004 National Exit Polls as conducted by Edison/Mitofsky formed the subject of many submissions and much of our presenters' testimony. Numerous submissions reported that the Edison/Mitofsky exit poll projected a victory for one candidate but the official vote count had the opposite winner (Dopp, K 001 p. 3; Mitteldorf, J 001 p. 1; Moss, B 001 pp. 18, 20; Simon, J 001 pp. 2, 7, 12). This was reported to be the largest discrepancy between national exit poll and popular vote count in the poll's history (Simon, J 001 p. 2; Mitteldorf, J 001 p. 1).

Submitters expressed concern that the exit poll discrepancy has triggered a controversy which has yet to be resolved (Dopp, K 001 p. 5; Dopp, K 002 pp. 4, 9, 11; Mitteldorf, J 001 p. 1; Moss, B 001 pp. 18, 20; Simon, J 001 pp. 2, 7), stating that the discrepancy between the national exit poll and the official vote results was not attributable to chance (Dopp, K 001 pp. 3, 4-5; Dopp, K 002 p. 3; Mitteldorf, J 001 p. 1; Moss, B 001 pp. 18, 19-20; Simon, J 001 p. 7).

Submitters noted that the shift between exit poll results and official results in the direction of one candidate in key election states (Moss, B 001 p. 19; Dopp, K 001 p. 5) was highly unlikely. An analysis by Dr. Steven Freeman was cited as showing that the probability that random chance accounted for this consistent discrepancy in one direction was well outside of the realm of statistical plausibility (Dopp, K 001 p. 5; Moss, B 001 pp. 19, 20).

Submitters reported that Edison/Mitofsky disavowed their results and proceeded to explain the discrepancy with a theory that Bush voters were reluctant to be polled (Dopp, K 001 pp. 3, 5). Submitters responded to this theory by reporting that Edison/Mitofsky's own data does not support it (Dopp, K 002 pp. 3-4, 11; Mitteldorf, J 001 pp. 2, 4; Simon, J 001 pp. 2, 11) and noting that the Edison/Mitofsky analysis does not seriously consider the hypothesis that official election results did not reflect the will of the voters (Mitteldorf, J 001 p. 4-5).

Dr. Josh Mitteldorf reported that a hypothesis that the exit polls accurately reflected the will of the people and the official election results are in error has support in Edison/Mitofsky data (Mitteldorf, J 001 p. 5) and that statistical tests that could corroborate Edison/Mitofsky's hypothesis are conspicuously absent from their report (Mitteldorf, J 001 p. 3).

Submitters stated that the discrepancy was most likely to have been caused by inaccurate election results (Dopp, K 001 p. 18; Dopp, K 002 pp. 4, 10, 11; Mitteldorf, J 001 pp. 2, 5; Moss, B 001 p. 20; Simon, J 001 pp. 2, 10), citing thousands of reports of irregularities in the election (Dopp, K 001 p. 4; Dopp, K 002 p. 9; Mitteldorf, J 001 p. 1; Simon, J 001 p. 3).

It was reported that there was a discrepancy between the accuracy of the exit polls with respect to the presidential race as compared to their accuracy for other races (Dopp, K 001 p. 16), and that there were discrepancies between the within-precinct error for paper ballots versus all other technologies (Dopp, K 001 p. 18; Mitteldorf, J 001 p. 4). One submitter stated that exit

polling for the 2004 election was a more advanced, sophisticated, and meticulous operation than any ever undertaken previously (Simon, J 001 p. 5), and in light of the history of exit polling and the care that was taken to achieve accuracy in the results, there is little to suggest flaws in the design or administration of the exit polls were to account for the discrepancy (Simon, J 001 p.11).

Presenters stated that the discrepancy was unlikely to be due to exit poll error (Dopp, K 001 pp. 7-16; Dopp, K 002 pp. 4, 10; Simon, J 001 pp. 2, 10) and that there is little to suggest significant flaws in the design or administration of the official exit polls (Simon, J 001 p. 12). Submitters reported that the same Exit Polls more accurately projected the Senate races (Dopp, K 001 p. 16). Dr. Mitteldorf said that he was skeptical of the Edison / Mitofsky claim that weather and placement of the pollster was a significant factor helping to explain within-precinct errors (Mitteldorf, J 001 p. 4).

Submissions expressed concern about the unavailability of Edison/Mitofsky's raw, unadjusted, precinct-level exit poll data as this would enable independent analysis (Dopp, K 001 p. 5; Dopp, K 002 pp. 4-5, 6, 11, 12; Mitteldorf, J 001 p. 1). It was stated that Edison/Mitofsky could materially improve collective understanding of the exit polls – and of whether they are evidence of vote fraud – through a full release of the data and by conducting further tests on the exit poll data (Dopp, K 002 p. 12).

There was concern expressed that private exit pollsters could adjust exit poll data to conform to actual official election results in the future, and neglect to publicly release any "unadjusted" data (Dopp, K 002 p.12; Moss, B 001 p. 18).

One submission stated that the national exit poll is the most accurate representation of the votes actually cast (Moss, B 001 p. 20). Jonathan Simon stated that in past elections publication of exit poll results prior to poll closings dampened voter turnout, and attributed this to voters regarding exit poll projections as all but infallible (Simon, J 001 pp. 4, 8). Simon proceeded to state that exit polling problems began to appear along with the development and spread of computerized vote counting equipment (Simon, J 001 p. 4). Others expressed concerns about security vulnerabilities, accuracy issues, and election officials having the power to suppress and distort vote counts (Dopp, K 001 p. 22; Mitteldorf, J 001 p. 1).

Kathy Dopp stated that the fact that all voting equipment technologies except paper ballots were associated with large unexplained exit poll discrepancies, all favoring the same candidate, warranted inquiry (Dopp, K 001 p. 22). She stated that the 2004 exit poll discrepancy in one of the world's oldest democracies is unacceptable (Dopp, K 002 p. 11), and she and Mitteldorf stated that the unexplained irregularities underscore the fragility of U.S. election systems (Mitteldorf, J 001 p. 1; Dopp, K 002 p. 11).

Kathy Dopp expressed concern that computerized vote recording and tallying equipment are sold by private corporations and increase opportunities for distortions of the vote counting process (Dopp, K 001 pp. 11, 22).

3. APPENDIX

A. PRESENTERS AND SUBMISSIONS

The following documents may be accessed at:
http://www.electionassessment.org/Submissions/2005-06-29EAH/

Alter, Judy

- 001: Abstract: The Straight Party Option in Santa Fe County - 2004 General Election
- 002: Executive Summary: The Straight Party Option in Santa Fe County - 2004 Election
- 003: Roster Count Versus Ballots Slides
- 004: Roster Count Versus Ballots
- 005: Absentee Votes - Roster Versus Ballots and Total Presidential Vote
- 006: Early Votes and Election Day - Roster Count Versus Ballots
- 007: Canvass of Returns of General Election Held on November 2, 2004 - State of New Mexico
- 008: Absentee Votes Spreadsheet
- 009: Early Voting Spreadsheet
- 010: Election Day Spreadsheet

Amato, Theresa

- 001: Toward Party-Neutral or Non Partisan Federal Election Reform

Ananda, Rady

- 001: Ohio County by Vendor & EIRs plus Map

Behrmann, John

- 001: Written Testimony of John Robert BEHRMAN
- 002: A Short List of Election-Related Technology Issues

Cobb, David

- 001: Testimony to Election Assessment Hearing
- 002: Voter Confidence Resolution with Guide (Source Document)

Corry, Charles

- 001: Electronic Voting Equipment Problems Tabulated by State and County
- 002: Basic Voting Principles
- 003: Bad Ideas for Voting
- 004: Bad Ideas for Voting Just Keep Coming (Source Document)
- 005: Voting Centers
- 006: Spreadsheet

Curtis, Clint

- 001: Call for Submissions
- 002: Affidavit

Curtis, Linda

- 001: Testimony, Election Assessment Hearing

Dopp, Kathy

- 001: Analysis of the 2004 Presidential Election Exit Poll Discrepancies (Source Document)
- 002: Patterns of Exit Poll Discrepancies: More On the Implausibility of a "Uniform" Bias Explanation for the 2004 Presidential Election Exit Poll Discrepancies (Source Document)
- 003: Analysis of Undervotes in New Mexico's 2004 Presidential Ballots (Source Document)
- 004: Summary: Utah Voting Equipment Selection Advice (Source Document)
- 005: Electronic Voting System Best Practices (Source Document)
- 006: What election data can Election Offices collect and publicly release in order to Monitor Elections for accuracy? (Source Document)
- 007: How Can Independent Paper Audits Detect and Correct Vote Miscounts? (Source Document)

Eaton, Sherole

- 001: Affidavit (Source Document)

Fitrakis, Bob

- 001: Election Reform Proposals: Lessons from Ohio's 2004 Election
- 002: Did George W. Bush Steal America's 2004 Election? Essential Documents (Source Document)
- 003: Introduction: Did George W. Bush Steal America's 2004 Election? Essential Documents (Source Document)

Forrest, Katherine

- 001: Submission (Source Document)

Griscom, David

- 001: Ballot-Box Irregularities Committed by Poll Workers at a Tucson, Arizona, Precinct on 2 November 2004
- 002: An Audit of 2 November 2004 Voting at Precinct 324 of Arizona Congressional District 7: A Playbook for Cheating on Opt-Scan Ballot Boxes
- 003: Summary

Harris, Bev

- 001: SECURITY ALERT: July 4, 2005 Critical Security Issues with Diebold Optical Scan Design (Source Document)

Healy, Sherry

- 001: Centralized Voter Registration Recommendations to EAC (Source Document)

Herrnson, Paul

- 001: Call for Submissions
- 002: Research on Voting Technology and Ballot Design (Source Document)
- 003: Contemporary Voting Machines Report (Last Updated Feb. 2004). (Source Document)
- 004: SGER: Human Factors Research on Voting Machines and Ballot Design. Presentation to NIST Symposium on Building Trust and Confidence in Voting Systems (Dec.10-11, 2003) (Source Document)
- 005: Presentation to NASED on Designing Interfaces for Voting Machines (Feb. 4, 2005) (Source Document)
- 006: "The Promise and Pitfalls of Electronic Voting" (Midwest Political Science Association, April 2005) (Source Document)

- 007: "The Impact of Voting Systems on Residual Votes, Incomplete Ballots, and Other Measures of Voting Behavior" (Midwest Political Science Association, April 2005) (Source Document)
- 008: Presentation to NSF Digital Government 2005 Conference (May 2005) (Source Document)
- 009: "Voter Intent, Voting Technology, and Measurement Error" (American Association for Public Opinion Research Conference, May 2005) (Source Document)

Karasek, Jo Anne

- 001: Constitutional Amendment for Secure Paper Ballot System

Klein, Stanley

- 001: Statement for Election Assessment Hearing to be Held June 29, 2005

Landes, Lynn

- 001: An Argument For Paper Ballots and Hand Counts ONLY (no machines, no audits)
- 002: History of Voting, Plus Q & A

Lehto, Paul

- 001: Evidence of Election Irregularities in Snohomish County, Washington General Election 2004 (Source Document)
- 002: Complaint for Declaratory Judgment and Other Relief (Source Document)

Lipscomb, Roy

- 001: Citizens Audit: A Fully Transparent Voting Strategy

Mark, Jonathan

- 001: Submission

Martinez, Juan

- 001: Massachusetts Election Protection: Securing the Voting Rights of Our Communities 2004 (Source Document)

Mercuri, Rebecca

- 001: Unilect Corporation PATRIOT Voting System: An Evaluation (Source Document)
- 002: Commonwealth of Pennsylvania Department of State Reexamination Results of Unilect Corporation's Patriot Direct Recording System - April 7, 2005 (Source Document)
- 003: Commonwealth of Pennsylvania Department of State Reexamination Results of Unilect Corporation's Patriot Direct Recording System - May 6, 2005 (Source Document)
- 004: Electronic Voting (Source Document)

Merel, Sharona

- 001: Overview of America's Elections – An Inspired Vision Off Course – Correcting Our Course

Mitteldorf, Josh

- 001: Response to the Report "Evaluation of Edison/Mitofsky Election System 2004" (Source Document)

Moss, Rev. Bill

- 001: Verified Election Contest Petition in the Supreme Court of Ohio (Source Document)

Phillips, Richard Hayes

- 001: Abstracts for Election Assessment Hearing
- 002: Stealing Votes in Columbus (Source Document)
- 003: Favoritism in the Suburbs (Source Document)
- 004: Another Third Rate Burglary (Source Document)
- 005: Uncounted Ballots in Ohio
- 006: Caterpillar Crawl in Cuyahoga County
- 007: Hacking the Vote in Miami County (Source Document)
- 008: Default Settings in Mahoning County (Source Document)
- 009: Election Results in Southwestern Ohio (Source Document)
- 010: One More Look at Southwestern Ohio (Source Document)
- 011: Log Cabin Republicans in Ohio

Pynchon, Susan

- 001: The scandalous implementation of the Help America Vote Act
- 002: Response and Solutions to Criticism of Automark

Selker, Ted

- 001: Security Vulnerabilities and Problems with VVPT (Source Document)
- 002: An Active Approach to Voting Verification (Source Document)
- 003: Orienting Graphical User Interfaces Reduce Errors: The Low Error Voting Interface (Source Document)
- 004: A description of an audio verification approach (Source Document)
- 005: The SAVE System: Secure Architecture for Voting Electronically (Source Document)

Simon, Jonathan

- 001: The 2004 Presidential Election: Who Won The Popular Vote? An Examination of the Comparative Validity of Exit Poll and Vote Count Data (Source Document)
- 002: A Logical Argument Against The Pursuit Of Vote-Counting Reform At The Federal Level
- 003: Letter to Jimmy Carter (1)
- 004: Letter to Jimmy Carter (2)

Test, Cynthia

- 001: Call for Submissions

Thayre, Heleni

- 001: Legislative Guidelines for Voting Procedures and Equipment (Draft)
- 002: How are Electronic Voting Machines Dangerous to Democracy? (Draft)

Waymack, Joseph

- 001: North Carolina's Ballot Blues (Source Document)
- 002: Prevent Election Fiascos (Source Document)

Windham, Bernard

- 001: Systematic Suppression of Student Voters (Source Document)
- 002: Summary of Election Problems by State (and counties) for selected counties in each state where a search was made of the EIRS election day hotline reports database for selected topics and key words. (Source Document)
- 003: Ohio Election Problems (Source Document)
- 004: Analysis of 2004 Florida Presidential Election Results by County Compared to Historical Patterns and Other Information. (Source Document)
- 005: Patterns of Touchscreen Voting Machine Vote Fraud Identified and Documented in Florida, Ohio, New Mexico and Elsewhere (Source Document)

Winger, Richard

- 001: Outline of Richard Winger Testimony