

How To Run An Election

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Introduction

Voting is a method for collecting the desires of a group of individuals as inputs and processing them to produce an output that is a choice between or among two or more alternatives. In any non-frivolous application of voting, it should be apparent that the most important consideration regarding any given voting issue is that the choice made should be the best one for the overall well being of the group. Simply stated, **the primary objective of voting on any issue is to make the best possible choice.** That having been said, there are some other quite important overall characteristics that voting systems should possess:

- Auditability – It must be possible to verify counts and results so that confidence is high that each input is being properly taken into account and that any fraud will be detected.
- Secret Ballot – Voters should have the right to freely cast their ballots privately and be free from force or coercion to vote any particular way.
- Transparency – A high percentage of electors should be able to understand the voting methodology and how the whole process works. (This is doubly important for election officials, judges of elections and poll observers.) Everything should be as “observable” as possible, so that confidence can be high that voting, counting and auditing are being carried out in accordance with prescribed rules and procedures.
- Fairness – A large majority of electors should feel that the process is “fair” (by whatever standards they may hold to be critical).
- Openness/participation – The process is open to any qualified voter *who has the interest and motivation to participate*, and a reasonable percentage of electors actually do participate so that decision making power cannot fall into the hands of a small group or an individual.

A voting system lacking these characteristics is not likely to be widely accepted and supported, making its long-term viability questionable.

Giga-words and Giga-hours have been devoted to the above five characteristics, but relatively little attention seems to have been paid to engineering the process so that it best achieves the main objective of making the best decisions. It might also be apparent that there are certain inherent conflicts that arise between the above desirable characteristics. Auditability and transparency tend to work in opposition to maintaining the secrecy of the ballot. Designing to facilitate making the best decisions could conflict with fairness and openness/participation. So far, it appears that any voting system will involve tradeoffs and it is important to make good choices in this regard.

The intent here is to comprehensively and logically explore how these tradeoffs should be made and how elections might best be run in the second decade of the 21st century. Two hugely important aspects of election mechanics will not be here addressed:

- Ballot Access – Various processes are used to determine what candidates’ names will appear on the ballot. Most of these require collection of a reasonably small number of nominating petition signatures to demonstrate a modicum of support. This is as it should be. However, there are some unfortunate instances where large political parties have

conspired to erect barriers that have the effect of keeping their competition off the ballot, thereby reducing voter choice.

- Voter Registration and Polling Place Screening – Voters normally must register to vote. They are then screened when entering the polling place. This process must be designed to insure that only voters authorized to vote at a particular polling place are admitted and that they do not vote more than once. Of course. Attempts to subvert the process are varied and manifold, including the classic example of dead people voting.

This discussion begins with the assumption that the correct candidates are properly on the ballot and that only living authorized voters are allowed to enter the polling place and vote once.

What's Wrong with Old-fashioned Paper Ballots?

Not much. Procedures have been fine-tuned over the years and paper ballots marked and counted by humans have served their purpose fairly well. In fact, careless attempts to introduce new technology have often been steps backwards and substantially none has actually been an overall improvement over paper ballots. Transparency and Auditability have frequently taken major hits. So, many regard paper ballots as still the “gold standard,” offering stability and a good balance of the above-mentioned tradeoffs.

How Technology Might Improve Upon Paper Ballots

An obvious approach is to start with paper ballots as the standard and look for ways that technology can be utilized to improve weaknesses without significantly sacrificing strengths. Here is a menu of some opportunities (6 and 7 below were developed in greater depth by the author in a 2007 paper titled *Voting for Better Decisions*):

1. Speed and Efficiency – This is the most often cited benefit of new technology. Clearly, if voters' intents can be accurately captured electronically, they can be quickly summarized, formatted to be both human and machine readable, published and forwarded to a central tally location as soon as the polls close. (Needless to say, this will be an improvement only if it does not significantly sacrifice any of the above important characteristics.)
2. Improve the Paper Ballot – If voters' intents have been electronically captured, they can be printed on paper in a standard form that is clear, unambiguous and human-readable. Arguments over the style of marking boxes or interpretation of handwriting (resulting in disputed ballots) can be substantially eliminated. Voters verify their printed ballots before depositing them into a traditional ballot box. The ballots become the ultimate authority on voters' intents. The ballots are used to verify and validate the published results of each polling place and if a recount becomes necessary. Initial results can be considered tentative until audits are completed.
3. Virtually Eliminate Spoiled Ballots – Voters are able to easily make, review, modify, re-review and re-modify all selections until they are completely satisfied with all choices. Over-votes and duplicated choices are not allowed. Voters must double-confirm their selections, but once the ballot prints and is verified, no further changes are allowed. A very clear and unambiguous ballot can be printed. If the ballot fails to clearly print or does not match the selections that were made, that would, of course, be an alarm condition requiring the immediate attention of the judge of elections.

4. Eliminate Ballot Position – A randomly selected half of voters can see their candidates listed in alphabetical order. The other half always sees candidates in reverse alphabetic order. Substantially eliminating the known statistical bias associated with ballot position may tend to improve the quality of the decisions made.
5. Facilitate Faster Audits – With voter-verified paper ballots and good auditing, there can be high confidence that any “computer mistakes” (unintentional or deliberate) will be detected and corrected in the published results. Although all software and hardware should ideally be open to public examination, solid auditing renders this far less important and, indeed, strongly discourages any attempt to influence results by jimmying the system. It is possible to provide auditors with aids (more detail later) that will usually allow completion of a thorough audit within a few hours of the polls’ closing.
6. Implement a Better Voting Methodology – It has been known for hundreds of years that the plurality voting method is seriously flawed in the case where no candidate receives a majority of the votes (e.g., the 2000 U.S. presidential election). Weighted voting or a good ranked choice voting method can remedy the problem, but necessarily adds some complexity. Although it could conceivably be done manually, the extra work would be child’s play for a computer. This is important as it could be expected to improve the quality of the decision making. Plurality engenders insincere voting in many contests, especially when some voters fear “wasting” their votes on their preferred candidate who is perceived to be weaker; they instead choose the “lesser of two evils” between two candidates they believe to be stronger. Note that Instant Runoff Voting (IRV) seems to be the best known of the ranked-choice voting methods, but it definitely is NOT the best. MRCV actually is the best possible ranked-choice method.
7. Reduce Impact of Uninformed Voters – It is reasonable to think that decision making quality would be improved if voters not informed or caring little about a given race refrain from casting any vote in that race. This already happens to some extent now (undervotes). Certainly eliminate any device (such as “straight ticket” voting) which facilitates thoughtless votes. A consolidated, unadorned, alphabetized candidate selection list could be built containing all candidates from all contests. Voters would select from this same list for all races (or write in a name). A voter unable to select the candidate that s/he wishes to vote for from such a list could at best only contribute noise to the selection process.

Things To Do and NOT Do

Processes or operations for which it is important to guarantee that correct procedure has been followed should be confined to the polling places during the hours immediately preceding, during and following an election (or to similar controlled settings where a recount has been scheduled). All eyes are on the polling places on election day. Arrangements have been made to have qualified poll workers in appropriate numbers in place (election judge(s), observers from opposing factions, constables and possibly media representatives).

Polling places are decentralized and locally controlled; this is good as anyone intent upon influencing an election will have much more difficulty doing it at many places simultaneously. Avoid having any critical operation performed at a centralized location or at a time other than on

election day. Minimize the use of absentee ballots to those cases where they are absolutely needed for good reason.

The entire election process should be understandable to a bright high school student. This has been called (Douglas) Jones' Rule and it is a good one. Certainly, all election judges, poll observers and election officials must have a clear and deep understanding of all critical operations, processes and procedures. At least for the foreseeable future, these considerations would appear to rule out cryptography-based end-to-end approaches. A famous science fiction author once pointed out that sufficiently advanced technology is indistinguishable from magic. Any form of modern cryptography would be the same as magic to most people. They may fear, with some justification, that some "magician" behind a curtain could control elections.

Don't print anything on a ballot intended to be verified by the voter that is not human readable. A voter cannot verify anything s/he can't read and understand. If the ballot is to be made machine readable, use an OCR font. However, introducing additional machines into the process is likely to create more problems than are solved. Voter-verifiable ballots do not enable auditing of such additional machines, so can they be trusted? It is probably wiser to adhere to the old KISS approach (Keep It Simple, Stupid).