

This assessment consists of three sections:

- An enumeration of some of the significant deficiencies of the Slalom report and reasons to reject it.
- Further assessments about the open source voting system (OSVS) project in light of the Slalom report's deficiencies.
- Additional notes that provide further background details supporting the key reasons to reject the Slalom report.

Key reasons to reject the Slalom report

Key reasons to reject the Slalom report and to not rely on it for guidance about the future of San Francisco's OSVS project include:

- 1 . The report does not adequately answer two important questions:
 - a . How much will the OSVS project cost?
 - b . How should the project proceed after the project's (first) planning phase?
- 2 . Nearly all of the report's cost estimates are vacuous, i.e. empty and meaningless because the estimates are for a generic, largely unspecified voting system; there is little to no explanation of what functionality the cost estimates could deliver, either at the low end or the high end.
- 3 . A number of estimates are unfounded and appear to be demonstrably excessive.
- 4 . The 100% contingency allowance for costs was a late addition to the report* and the justification for such a large contingency allowance, a lack of knowledge of San Francisco's requirements, appears to be either a result of poor planning or a capricious attempt to further inflate the cost estimates.
- 5 . The report does not offer a cost estimate for its recommended procurement option, the seventh, which would likely be the report's lowest cost option.
- 6 . The report is extremely limited in the types of procurement and development approaches it considered.
- 7 . The report recommends a fundamentally old school, high risk, inevitably budget busting waterfall project methodology with little more than an "Agile" label slapped on it and then misleadingly wrapped in some basic agile methodology jargon.
- 8 . The report attempts to compensate for its deficiencies by recommending a second planning phase, what it calls the Discovery phase, which unrealistically seeks solutions to some issues, which can only be resolved through actual development work. Such a recommendation is symptomatic of a mismanaged project experiencing analysis paralysis.
- 9 . The report is confusing in its presentation as a result of late revisions*.
 - a . Its executive summary was removed.

* Based on a comparison to the draft version of the report that was the most recent version as of the report's contractual due date, January 26, 2018, as determined and supplied by the Department of Elections.

- b . Development costs for its most expensive procurement option were given early and prominent coverage without adequate indication that those costs were not the only version of development cost estimates, but rather the development cost estimates for only one of seven procurement options.
- 10 . The report does not adequately distinguish between project costs and the share of those costs that San Francisco might bear. It fails to account for possible state funding or funding from private sources.
- 11 . The report recommends, with little to no justification, taking action to overturn the Elections Commission's policy that the OSVS project should develop a voting system that is open source and paper based. It makes these recommendations as spurious remedies to unrelated or misconceived risks.
- 12 . The report naively presumes that the accurate cost estimates that it was supposed to have produced can be obtained during a subsequent Discovery phase, in which only high-level requirements are to be determined, however.
- 13 . The report failed to cover RFP and contractually required topics and barely covers others. Such topics include total cost of ownership, existing patents as possible impediments, integration testing, how to attract and evaluate contractors, and criteria to identify the best hardware components.
- 14 . The report grossly mis-characterizes the Open Source Community as being comprised only of unreliable volunteers.
- 15 . The report ignores the existence of OSVS components already developed and in use.
- 16 . Where the report finds that San Francisco's in-house development capabilities to be insufficient, the report considers few if any options for strengthening those capabilities other than hiring expensive consultants for one-off work assignments.

Further assessments and conclusions

The Slalom report was not entirely without value. However its extensive deficiencies make it unsuitable for the purposes for which it was needed. It was a significant waste of project elapsed time and financial resources. It represents a fundamental project management failure.

The deficiencies of the Slalom report and the project management failure that the report represents have been further evident in the late and grossly inadequate 2018 application to COIT for further funding of the OSVS project. This is the third year in a row that the project has failed to make a minimally competent COIT application.

This year's application identified exorbitant funding requirements beyond FY 2018-19. For FY 2018-19, the request did not reflect the Election Commission's March resolution and instead appeared to request only enough additional money to fund the Slalom report's ill-conceived notion of a Discovery phase as a next phase. Even Slalom's example schedule indicated that more could be accomplished during the next

year of the project. The application did not include for FY 2018-19 any specific description of deliverables, activities to produce deliverables, major items of expenditure, or a project schedule for the year. In short, there was nothing to indicate that the requesters had done sufficient planning to bolster confidence that any additional funding would be well spent in pursuit of the project's laudable goals.

Some of the report's deficiencies can be attributed to Slalom's own lack of prior expertise in the core domains of elections, voting systems, and agile development. A result is that much of the report fails to reflect insight that goes beyond the input to the Election Commission's 2015 open source policy. However the causes of the report's deficiencies go beyond Slalom's contributions to the report.

It would be a further waste of time and money to try to repair the Slalom report. Project efforts would be better spent on changing management practices to prevent further repeats of such failures. Needed change includes ensuring accountable governance for the project, ensuring that the project is led from the top by people who are dedicated to making the project a success, and isolating project-related decision making from influence by those who do not want the project to succeed.

Rejecting the Slalom report will send a strong signal that the Elections Commission expects future deliverables to be high quality, constructive contributions to the OSVS project. Failure to send that signal now will greatly elevate the risk that further resources expended on the project will turn it into a very expensive failure.

Additional notes - background details

The questions in 1.a and 1.b were the key questions members of the Elections Commission identified in its January, 2017 meeting when the plans for producing what became the Slalom report were first discussed at a Commission meeting.

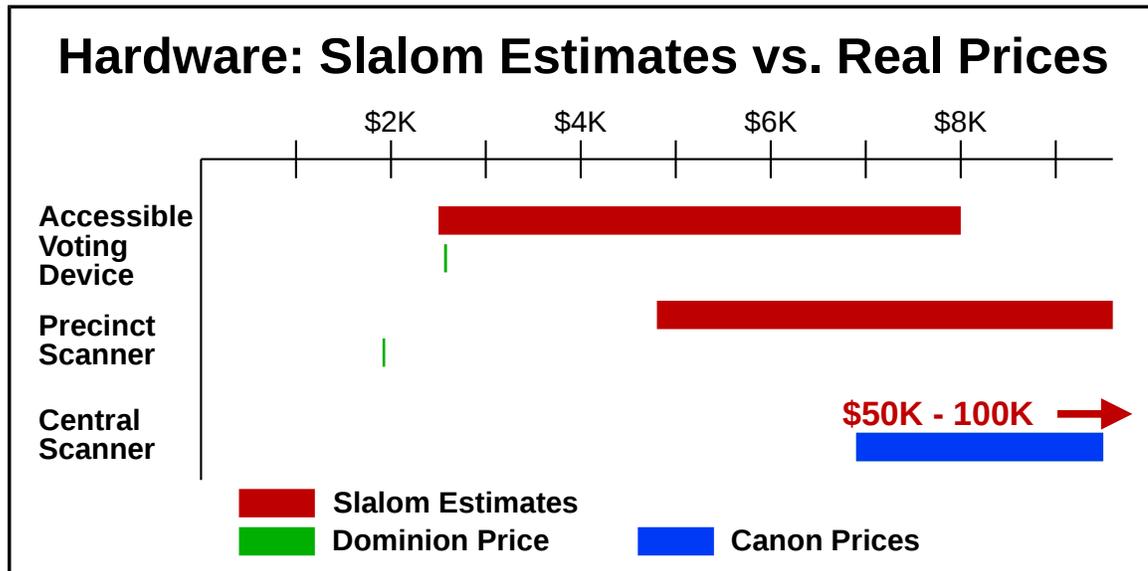
Key reason 2 is applicable even if nothing were known about San Francisco's specific requirements. It is an issue that Slalom evaded when questioned about it during the Commission's March 21, 2018 meeting.

Regarding key reason 3:

- Slalom estimates that it will take 5 - 10 full time contractors, each costing \$360,000 per year (or maybe just 5 of them, but each costing up to \$720,000 per year) just to maintain the system for every year of the system's useful lifetime, even if no functional improvements are being developed. This is an absurdly high estimate for which Slalom provides no justification.
- The estimates of up to \$1M per year for application hosting in the cloud is similarly absurd given that only the remote accessible component could be connected to the Internet. Even that component's use would be relatively low volume by web application standards and even then on average for only about

eight weeks or less per year.

- A comparison of Slalom estimates for hardware versus Dominion unit prices for full voting system prices are shown in the following figure and table.



Device Type	Slalom Estimates	Dominion Price	Canon Price
Accessible Voting Device	\$2,500 - \$8000	\$2,575	
Precinct Scanner	\$4,800 - \$9,600	\$1,925	
Central Scanner (Total)	\$50K - \$100K		\$6,900 - \$9500

Note that the comparisons shown here tend to be conservative, i.e. reduce likely actual differences:

- Slalom estimates are for just hardware.
- Dominion prices are for recent, complete, functional, certified voting system devices with election-specific software from a traditional vendor, with all of its markups in a highly concentrated, less than competitive market, as sold to counties in Colorado.
- The Dominion accessible voting device is a combination ballot marking device and paper ballot scanner.
- The Dominion precinct scanner is also a combination ballot marking device and paper ballot scanner, but without all of the accessible features of the accessible voting device.
- For central scanners, Slalom does not indicate unit prices or the number of scanners used to calculate its total estimate. The unit estimates shown here

- are based on an assumption of six scanners. The Department of Elections currently operates with only four central scanners.
- The Canon prices are unit prices on Amazon for new, single unit purchases of the higher-end models that Dominion rebrands and sells as their central scanners: Canon DR-G1130 (100 ppm duplex) and Canon DR-X10C (130 ppm duplex). The Canon unit prices shown here also include an additional allowance of \$1,500 for a laptop or desktop computer to drive the scanner.
 - Current Department of Elections scanners scan at rates of about 240 ppm duplex. However newer voting systems that support image-based adjudication of ballots do not require outstacking and rescanning of anomalously marked ballots. This enables simpler scanning protocols that make more effective use of operator and machine time to do actual scanning, so lower ppm (pages per minute) scanning rates can provide similar capacities with about the same number of units.

Regarding key reason 4, San Francisco's use of its current voting system could have served as a ready source for a base of San Francisco's business functional requirements for the Slalom report. That base could have been easily augmented as desired by any forward looking requirements from the Department of Elections 2015 RFI or its RFP for an interim voting system.

Regarding key reason 6, approaches such as conducting contests and establishing a bounty are approaches that were not mentioned in the Slalom report. None of the procurement or development approaches that Slalom considered appeared to be adapted to and take advantage of the open source nature of the system being developed.