



08 January, 2010

## The Federal Voting Assistance Program

Mr. Scott Wiedmann, Deputy Director  
c/o Business Transformation Agency  
1851 S. Bell Street, Bldg CM3, Room 425  
Arlington, VA 22240-5291

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Re: Response to RFI— Solicitation Number: BTA\_RFI\_0001  
Federal Voting Assistance Program (FVAP) COTS Product

### Greetings Deputy Director Wiedmann:

The Open Source Digital Voting Foundation (OSDV), a non-profit public benefits corporation developing open source voting technology and representing the general public and stakeholders comprised of States' elections directors and other voting systems experts across the nation, is pleased to submit a public response to your Request for Information as administered by the Business Transformation Agency.

We applaud the Federal Voting Assistance Program (FVAP) effort and commitment to serving the Uniformed and Overseas Citizens Absentee Voting Act (UOCAVA) by developing a MOVE Act implementation strategy and plan that particularly serves the absentee requirements of our overseas citizens and military in this age of digital democracy.

We completely concur that there needs to be a way and means for this essential population of the U.S. electorate to ensure they are enfranchised in the cornerstone of our democracy: the casting and counting of votes in free and fair elections. We take that assertion one step further and submit that in this digital age by stating that it is imperative there exist digital means to ensure a voter's registration is in order and that they may receive a blank ballot to greatly reduce the disenfranchising cycle time and distance barriers to participation. This is in part the fabric of the mission of our Foundation. We hope that the Director and FVAP find our comments helpful and informative.

Respectfully Submitted,

### Gregory A. Miller, JD

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**Before the  
BUSINESS TRANSFORMATION AGENCY  
ON BEHALF OF THE FEDERAL VOTING ASSISTANCE PROGRAM  
Arlington, VA 22240-5291**

In the Matter of     )   BTA\_RFI\_0001  
                                  )  
FVAP MOVE ACT IMPLEMENTATION   )   Information Technology Services  
                                  )  
COTS MARKET RESEARCH     )   NAICS: 541519

**RESPONSE SUBMISSION — SOURCES SOUGHT**

**THE OPEN SOURCE DIGITAL VOTING FOUNDATION AND TRUSTTHEVOTE PROJECT**

**Introduction**

The Business Transformation Agency (BTA) in its assistance to the Federal Voting Assistance Program (FVAP) requested information about available commercial off-the-shelf (COTS) software packages that meet FVAP needs. The OSDV Foundation and the TrustTheVote™ Project (hereinafter “OSDV”) is pleased to respond to this request for information, and gratefully acknowledges the assistance of several parties in providing information to aid our preparing this response: Election Information Services, LLC, the Overseas Vote Foundation, David Webber of the OASIS TC for Election Markup Language, and the Pew Center for the States Voting Information Project, sponsored by Google.

**Overview**

The Business Transformation Agency (BTA) in its assistance to the Federal Voting Assistance Program (FVAP) requested information about available commercial off-the-shelf (COTS) software packages that meet the following requirements:

- Assists military and overseas voters to
  - Register to vote,
  - Request an absentee ballot, and
  - Obtain a blank, mark-ready ballot that:

- Is specific to the voter’s jurisdiction, with Federal, State and local offices and applicable referenda
  - Can be marked and completed electronically
  - Can be printed by the voter
  - Can be marked by hand if not marked electronically
  - Can be physically returned to the local election officials appropriate for the specific voter
- Performs this assistance in a State-specific manner, to account for **all** States’ distinct requirements and practices in registration, absentee voting, and balloting.
  - Performs this assistance with the support of data sharing and inter-operation with **all** State or local Voter Registration Systems and Election Management Systems of 56 States and territories.

To the best knowledge of OSDV, **no such COTS software package exists.**

Therefore, we anticipate that, in order for FVAP to obtain the required capabilities, FVAP will need to engage in a project of tailored application-specific software development and system integration, building on existing relevant technology to deliver these capabilities to military and overseas voters and to their State and local elections officials. Given the non-profit mission and public benefit work of the OSDV Foundation and TrustTheVote Project, the remainder of this RFI-response is intended to provide BTA on behalf of FVAP with potentially useful insights about what a hypothetical “*FVAP Compliant Solution*” might be from our perspective as architects and engineers of publicly owned, open source elections and voting technology. Such a hypothetical solution includes references to relevant existing technology or use cases. It is solely our intention to advise, counsel, and inform the FVAP on a technology approach in lieu of suitable COTS.

### **Hypothetical FVAP Solution**

For purposes of providing information as described above, we define a hypothetical FVAP Solution that consists of the following capabilities or components:

- **Registration Wizard** – an on-line interactive Web application that assists the user in preparing and then printing a State-specific Federal Post Card

Application (FPCA), and directing the user to send the printed form to the correct mailing address for the local election office appropriate to the user.

- [Absentee Request Capability](#) – an additional feature of the Registration Wizard, in which the user can prepare the FPCA form to request an absentee ballot.
- [Voter Registration System Link](#) – an additional feature of the Registration Wizard for sharing information with State Voter Registration Systems
- [Blank Ballot Wizard](#) – an on-line interactive Web application that assists the user in finding and downloading a blank ballot that is specific to the voter’s jurisdiction.
- [Election Management System Link](#) – an additional feature of the Blank Ballot Wizard for obtaining ballot information with jurisdictions’ election management systems.

Each of the following section provides more information on each of these capabilities or components, including relevant existing technology that could be used in the construction of each.

#### **Hypothetical FVAP Solution: Registration Wizard**

The technical feasibility of the hypothetical Registration Wizard has already been proven by existence and successful use of online voter registration systems operated NGOs such as: Rock The Vote and OSDV; League of Women Voters; and most notably the Overseas Vote Foundation (OVF), whose wizard is specifically for FPCA preparation.

The OVF wizard in its current state, to the best of OSDV’s knowledge, is insufficient to provide the capabilities of the Registration Wizard portion of FVAP Solution, because its per-State customization has been performed for only a subset of the 56 States and territories of interest to FVAP. However, the OVF wizard does demonstrate the ability to perform the functions of State-specific user interface, data collection, and form preparation. Hence, the potential use of the OVF wizard, in the context of FVAP Solution, would be extending to the full 56 the set of States/territories that are supported. We are not able to provide a ROM estimate of this approach, but anticipate that an OVF RFI response would do so.

An alternative approach would be to develop a new FVAP Solution Registration Wizard using current and typical technologies and platforms for development of Web applications. One potential benefit of this approach could be the development of a common data format for the expression of State-specific meta-data that describes a State's requirements for collection of voter information for an overseas or military voter's registration, registration update (e.g. change of address), or absentee request. In any case, however, a significant part of the task (to develop such a wizard) is legal and policy research to determine the specifics of each State's requirements.

OSDV has developed (in collaboration with Rock The Vote) a similar wizard, though oriented to domestic voter registration. In the course of doing so, the legal and policy research was performed for the District of Columbia, and 47 of the 50 States that are relevant for domestic voter registration by mail using the standard NVRA form. The results were compiled into a meta-database and used to drive the State-specific processing of user interface, data collection, and document preparation. Based on this experience, we can provide a rough order-of-magnitude estimate for part of the development of such a wizard for FPCA assistance: direct expenses for 35 to 50 person-weeks of labor time for a team of software developers, user-interface designer, system architect, project manager, legal/policy researcher, legal review, and translation services for multi-language support. Please note:

- This estimate assumes the use of a particular technical development approach and technology platform (“agile development” using the Ruby-on-Rails<sup>1</sup> platform).
- This estimate does not include other costs such as hardware acquisition, license fees for COTS proprietary software (operating systems, DBMS, Web server), service/support fees for proprietary software (operating systems, DBMS, Web server), service/support fees for open-source software, system integration of the custom-developed software with hardware and platform software, and deployment in and managed server and/or managed application support environment.

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<sup>1</sup> See generally: [http://en.wikipedia.org/wiki/Ruby\\_on\\_Rails](http://en.wikipedia.org/wiki/Ruby_on_Rails)

- The range of this estimate (35 to 50) can vary depending on the amount of State-specific policy research that is required, the number of languages supported, the degree of ADA support provided, the level of sophistication of graphical and user interface elements, and other factors.

Another existing technology, relevant to the Registration Wizard, relates to the acquisition and use of the information required to determine the mailing address of local election official based on self-reported geo-location information provided by the voter (street address, zip code and State of residence). The hypothetical registration wizard described above (FVAP completion, full State-specific processing) simply assumes the existence of data that maps from a user's location to a mailing address for return of the FPCA form. For simplicity, the State-specific meta-data can include a single address for the entire State. However, one possible elaboration is to direct the forms to be mailed to local jurisdictions. Doing so, however, requires the collection and maintenance of a database of detailed local information for all States and territories. Rather than including this task in the development and operation of the Registration Wizard, one alternative is for the Wizard's back-end components to acquire this information from the service of the Voting Information Project (VIP), which has collected street file data from some States. For other States that have not yet participated in VIP, such States could begin to participate (given the benefit of MOVE Act implementation that they would gain via the FVAP Solution), or to provide street file data directly to the FVAP Solution, or to rely on a single address for the entire State.

#### **Hypothetical FVAP Solution: Absentee Request Capability**

Like the registration capability, the OVF wizard has already similarly demonstrated the absentee request capability in terms of using the FPCA. For any such FPCA-based registration wizard, the additional feature of absentee request is a minor extension of use of the FPCA – typically the use of fields (4c) and (6), though State-specific rules apply. We believe that the addition of an absentee request capability is a very modest extension that would not have a significant effect on a ROM estimate.

One variation of this capability is to not use the FPCA (for absentee request), but to generate an absentee application specific to the voter's State and in conformance with respective State laws related to eligibility for absentee applications. The information gathered would be same, but there would be a very modest additional task for creating the additional State-specific application, filled in, in addition to the FVAP for registration.

#### **Hypothetical FVAP Solution: Voter Registration System (VRS) Link**

The function of a VRS link would be to have the FVAP Solution Registration Wizard's back-end components be able to perform data inter-change with a State VRS. Among the benefits enabled could be:

- providing States an ability to validate voters' eligibility for registration and/or absentee ballot, based on user provided information;
- in the case of a valid registration and/or absentee application, providing the ability electronically capture and store the provided information
- where applicable by State law, providing the ability to complete the valid request processing electronically and in real time.

#### **Hypothetical FVAP Solution: Blank Ballot Wizard**

The initial purpose the Blank Ballot Wizard would be to collect information from a voter to determine which existing blank ballot (for an upcoming election) would be appropriate for the given voter, and to determine the mailing address of jurisdictional office to which the completed ballot should be returned. Further, the blank ballot delivered would have the ability for the voter to use existing software to complete the ballot.

There are several possible approaches to the initial purpose. Common to most or all is the requirement for the Wizard to be able to obtain data from States or local jurisdictions, data that describes a particular ballot style, and links it a particular precinct or precinct-split which contains the specific voter's registered address. While not part of the user-visible function of the Wizard, this data link is perhaps the most challenging. In the most ambitious approach, the Wizard back end would utilize an Election Management System Link to interoperate with every local

jurisdiction to obtain the relevant information, and expect such systems to provide it in a common data format.

One alternative approach would be to utilize and extend the Voting Information Project infrastructure that already has the data (for some States) that maps from a voter's registered address to a precinct or precinct-split. If the ballot data were provided via Web publication (rather than a real time Election Management System Link), then a simple extension of the VIP infrastructure would enable States to publish to VIP the Web address that voters could use to obtain the blank ballot for their precinct or split. The same could be true for published information that directs to voter on proper preparation and mailing of the absentee ballot enclosure, and correct mailing address to use, etc.

There are also alternatives to method by which the blank ballot is completed. In the most ambitious scenario, a particular ballot's Web address would actually be an instance of the Ballot Completion Wizard. Such a Wizard would be similar to the Registration Wizard's function of collecting user input and preparing a printable form, except that instead of the same form in every case (FPCA for the Registration Wizard), the online UI (user interface/experience) and paper form would be dynamically generated for each distinct ballot style. Each user would see a UI for ballot completion, and print a particular ballot document, based on ballot definition data published by the State or local jurisdictions. This approach is tantamount to providing a Web application that is an Internet-based Ballot Marking Device, using common data format for ballots, adopted by and published by every participating jurisdiction. Even leaving aside the substantial challenges of common data format adoption and dynamic publication of data in this format, the software development costs would be at least an **order of magnitude** larger than a Registration Wizard.

A more modest approach would **assume** the publication of each ballot as PDF file, so that the user can be directed by the Blank Ballot Wizard to the appropriate PDF file for their ballot, download the ballot, and complete the ballot. The digitally-enabled marking approach is based on using PDF active form-fields for the ballot areas in which a user can make a mark to indicate a candidate selection.

The method for electronic marking would be the use of any of several widely available (and in some cases freely available) PDF reader tools with support for active form-fields. For those voters who could download the ballot PDF file and use such a tool, the tool would enable electronic marking. For others, printing and hand marking remains an option. Though not an issue for the Blank Ballot Wizard *per se*, this approach represents a **considerable assumption** that every election jurisdiction could both generate ballots in PDF form (presumably using their existing voting system's EMS features), and also add the active form-fields for the bubbles (or similar ballot mark zones). Such post-facto emendation of voting-system-generated ballots, at large scale, would require significant automation that, to our knowledge is not readily available as COTS. An even more modest approach would be publication ballots as standard image files (GIF, JPEG, etc.) without any post-processing; electronic marking would be possible for the relatively smaller portion of voters with access to image processing software that enables modification of the image by electronically "filling the oval".

#### **Hypothetical FVAP Solution: Election Manage System (EMS) Link**

The EMS Link capability has been described in the previous section. Note that in some of the potential approaches described in the previous section, an EMS Link could be rendered unnecessary. For example, if the VIP infrastructure is used for the Wizard to direct voters to the Web address for their appropriate ballot, and these Web addresses simply provide downloadable ballot files to be marked by hand or by local software (PDF or image editor tools already on the voter's PC), then the Wizard may not require direct linkage to EMSs.

## Summary

To the best of our knowledge and experience<sup>2</sup>, there are no existing COTS software solutions that *completely* provide the capabilities required by the FVAP, particularly the capabilities for Wizard State-specific processing for all 56 State/territories, full multi-language support, and common data format (CDF) support for CDF-based data interoperability with VRS or EMS systems.

We believe that in order to gain these capabilities, FVAP will have to engage in a project of custom software development and system integration to create these capabilities. One approach may be to work with a proprietary COTS vendor on a project to adapt an existing product with customization, localization, and other modifications. Such an approach has the benefit of starting with an existing product, but this can also be a drawback if the existing product's basic concept of operation is not entirely consistent with the FVAP's vision for these voter assistive services. Internet voting products may be a likely candidate for both partial capability and this type of inconsistency. And importantly, any proprietary COTS approach also suffers from "vendor lock-in" as well as raising reasonable questions about transparency.

We observe that FVAP's requirements can be met with a different approach that leverages existing public infrastructure and common data formats (e.g., VIP), and builds on proven open-source technology for agile and rapid development of Web applications. FVAP would engage with technology service providers for software development and system integration to implement the FVAP Solution on this existing technology base. In this approach, all the costs of development and deployment are visible, and there is no vendor lock-in. Further, should such a solution embrace an open source approach, we believe a higher degree of accuracy, transparency, trust, security, and continual innovation is possible.

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<sup>2</sup> **Ed. Note:** Bear in mind that one of the principal driving forces behind the inception of the Open Source Digital Voting Foundation and the launch and development of the TrustTheVote Project ([www.trustthevote.org](http://www.trustthevote.org)) is that there are no commercial solutions to elections and voting systems today that can provide the level of accuracy, transparency, trust, and security to ensure the integrity deserved in the age of digital democracy. It is the Foundation and Project's mandate to remedy such with true innovation, void of legacy voting technology considerations, the complexities of commercial incumbency, and yet honoring the federalized architecture of America's elections processes while seamlessly integrating with existing collateral (legacy) government information systems and services. Accordingly, when we observe, "*to the best of our knowledge...*" we are expressing a learned opinion based on three years of researching elections systems technology.

Operating an FVAP Solution developed with public funding, FVAP would be free to extend and evolve the Solution over time using the technology development and service providers of its choice. Further, if the Solution itself is open-source, then other entities besides FVAP may contribute new technical capabilities that FVAP could choose to adopt and incorporate in the FVAP solution for future versions/revisions.

Respectfully submitted,

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