Proposal for a Paradigm Shift

Online Voting for U.S. Overseas and Military Voters Accepted and Supported by Computer Scientists and State Election Officials

Submitted to the
Democracy Fund

Name:	Overseas Vote Foundation, Inc. (OVF)
Business Structure:	501(c)(3) nonprofit, nonpartisan, public charity
Description:	OVF is a nonprofit, nonpartisan organization that helps absentee voters participate in federal elections by providing public access to interactive web services
Year Founded:	2005
Address:	4325 Old Glebe Road, Arlington, VA 22207
Main Contact:	Susan Dzieduszycka-Suinat, President and CEO
Telephone:	+1 202 470 2480
Fax:	+1 202 318 0653
Email:	susan@overseasvotefoundation.org
Website:	www.overseasvotefoundation.org
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Introduction / Situation

As an organization focused on overseas and military voting challenges, Overseas Vote Foundation (OVF) has spent 8 years, including 5 general election cycles, executing our core activities: technological innovation and development, voter survey research, and building positive collaborative dialogue amongst stakeholders in the overseas and military community. All of this activity has been focused on our objective to improve the overseas and military voter experience. We have indeed caused "disruption" to the status quo, and in doing so inspired constructive reform and modernization to a previously stagnant and archaic voting process.

Overseas and military absentee voters (UOCAVA voters) can now access registration services, voter information, and ballots online. [1] Nevertheless, the process remains imperfect. The OVF 2012 Post Election Survey revealed that 22 percent of respondents either did not receive the ballot they requested or received it too late to vote.[2] Further, the overseas and military ballot return rate is only 73 percent, indicating that more than a quarter of ballots that *are* received are not returned to be counted. The implication of these statistics is significant: in 2011, the State Department estimated that 6.8 million Americans live overseas, an amount greater than the population of 37 of the 50 states in the United States.

Attempts have been made to facilitate the receipt of blank ballots and the return of voted ballots. The majority of states utilize email with attached PDF files to transmit blank ballots. In 2012, 24 states allowed voted ballots to be returned via email or fax in the 2012 general election.

At its most basic, email and post are being used as boxes in which ballots land. Neither provides great value for the election official in administrative challenges. The ballots using either method will have to be handled multiple times, they can disappear or be lost and the system doesn't reconcile or report. Email is not a voting system simply because it is online. However, by being online, a ballot in email is subject to vastly increased integrity threats. Email and its contents can be easily tampered with and spoofed.

Again: email was never designed to be a voting system. It doesn't begin to have the security or administration features needed to guarantee the integrity of the ballot or the election overall. With the current situation, overseas and military absentee voters absentee voters cannot return their ballots online with assurance that they will be counted as cast or in fact counted at all.

Unfortunately, for election officials and voters alike, there are no online voting options that the election integrity community currently supports. With this project, we propose to transform this situation.

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1 Overseas and military voters are referred to as UOCAVA voters based on The Uniformed and Overseas Citizens Absentee Voting Act (UOCAVA) of 1986. The Act provides the legal basis for absentee voting requirements for these citizens.

2 For the fifth consecutive general election cycle, OVF administered its unique post election survey of overseas and military voters. Survey invitations were sent to over 97,000 overseas and military voters with respondents representing 160 countries and all 50 states, the District of Columbia and Guam. Full methodology and survey results are available upon request.

Request for Support

OVF requests $200,000 support over a period of 12 months from the Democracy Fund to bring together a "Team of Rivals" to research and specify the development, testing and supply of a secure online overseas and military absentee voting solution to election officials and overseas and military voters by 2016.

Standoff in the Election Community

Election Officials

There is great demand on the part of election officials to offer better solutions for remote absentee voting, in particular to the military community overseas and the disable voter community within the US. Election officials are seeking new technology to meet these needs. Very often, however, the election integrity community thwarts election officials in their attempts due to the lack of security and auditability assurances in the methods they propose.

With no widespread technology to meet their needs, election officials are turning in ever-greater numbers to vendors with untested, uncertified products, or to weak stop gap methods such as email which is susceptible to intrusion and exposes interception of the ballot on the open Internet, while offering no election process support.

Indeed, election officials surveyed by OVF reported that email was the primary method of voted ballot return for the overseas and military community in the 2012 General Election, with close to 37 percent of voted ballots returned using email.[3] Email, despite the risks, is fast becoming the default ballot transmission method.

The frustration of the election officials is increasing. They need real solutions to remote and accessible voting in order to meet the needs of the electorate who demand better, broader, faster service, and to the public who want greater insight into every election and its results. The pressure on the election officials is considerable, and they will not relent in their search to improve the situation.

Scientists and Experts

The majority of US computer science experts are against online voting solutions for many valid reasons. While some of their arguments may be legitimate, because of their unyielding opposition to online remote voting solutions they are not offering alternatives that the election officials like, and this has brought them an ever-increasing reputation as obstructionists to improving the electoral process.

As a result, election officials and existing vendors are avoiding constructive dialogue with many of our countries finest minds and talents and subsequently seeking less optimal solutions to the challenge of online voting that we face today. Because of this impasse, the concern of the election integrity community is deepening. They see that they

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[3] Following the 2012 General Election, OVF conducted its fourth survey of local election officials (LEOs) across all the U.S. States and territories. Survey invitations were sent to 7,785 LEOs and absentee voting clerks. Full methodology and survey results are available upon request.

cannot stop the progression toward remote online voting, but they now stand on the outside, shunned by the people that need them the most.

Strategy – Team of Rivals

Despite their differences, these two sides have common ground: there is a fundamental commitment to preserve the integrity of the ballot. At the same time, there is a desire to bring more voters into the democratic process, and to make voting more available and accessible to overseas, military and disabled voters who face greater hurdles in the voting process.

Building on this common ground, OVF proposes to bring election officials and scientists together to form a "Team of Rivals" that will tackle the challenges and delineate a specification for a usable remote voting solution that preserves ballot integrity.

OVF is ideally placed to direct and mediate this process. As an organization with the track record, mindset, ability and capacity to innovate and solve real problems for UOCAVA voters, we are accustomed to questioning the status quo. We have consistently brought the many factions of the election community together to discuss and work toward innovative absentee voting solutions for the UOCAVA community and is poised to do it again.

The "Team of Rivals" will be comprised of a selected group of esteemed experts in computer security and voting, usability and election integrity together with a selected group of state and county election officials who have expressed an interest in secure online remote Internet Voting (IV). The election officials will inform the experts of their needs and system requirements. The experts will design and specify an accessible system that they feel can best withstand cyber security threats and protect the integrity of the ballot.

OVF will manage the project itself in all its phases, the team dynamics, and the outcome to assure that the result becomes an available system that can be acquired in the open market.

End-to-End Verifiable Voting Technology

Computer scientists are reluctant to recommend the idea of voting over the Internet, however they do agree that if it does happen, it should be a system that takes advantage of End-to-End (E2E) verifiability and auditability.

As defined by Josh Benaloh, Senior Cryptographer at Microsoft Research, E2E is a property of an election, not a single technology. The two important components of an E2E election are that 1) voters can check that their ballots are cast as intended; and 2) anyone can check that the cast ballots have been accurately tallied.

Systems that produce E2E-verifiable elections usually utilize cryptography. The process introduces a new level of election integrity, not known in other voting systems. At the same time, E2E-verification concepts introduce usability challenges, which must be overcome to make the system viable.

These security properties of E2E are acknowledged by the scientific community, and have been demonstrated in the development of prototype systems, such as Helios and Remotegrity. We will consider taking advantage of developed technology to bring forward an IV system that fully employs the concepts of E2E-verifiability.

Testing

We contend that in order for an IV system to be accepted by the voting public, it is crucial that the process we propose be cooperative and transparent. The computer security community must be permitted to view and comment on all aspects concerning meeting security requirements, and election officials and legal authorities must be assured that usability requirements are met to their satisfaction.

For these reasons, we will subject our system to open and rigorous testing to establish a new benchmark for IV system security properties. By leading and demonstrating transparency by example, awareness of security IV requirements and election official demand for testing will grow, thereby encouraging commercial vendors to follow suit.

Proposed Program Actions

Phase I - Establish Team, Document Research and Specifications

1. **Identify/Recruit Team Members**

- Scientists, subject-matter and usability experts, typically known for their commitment to ballot integrity and election auditability will be brought together to support this development project. Please see Appendix A.
- Potential state and county election officials who will support and contribute to the requirements document should be contacted and chosen according to interest and availability. Please see Appendix B.
- Project Management and support staff.

2. System Specification Development and Documentation

A. Whole Product Solution Specification

A "whole product solution" approach will be used in order to address the full range of requirements for bringing a new solution to market. These aspects of the system must also be specified and will include, but not be limited to the following:

- Use Case Analysis and System Requirements
- Specifications including Security and Usability
- System Development Planning and Integration
- System and User documentation
- Legal and administrative recommendations and documentation
- System support and maintenance
- IT sys admin requirements and training
- Data center operation guidance: server hosting, maintenance, staffing and operational requirements

- Election official training on system procedures and use
- Life cycle cost management
- Complete business plan including go-to-market strategy

B. Technical Specifications and Considerations

Security
The security requirements will inform the software design from the beginning.

Most IV security challenges have been detailed already (for example, in the 2011 NIST reports 7682, 7711, 7770). Such research will be analyzed and used to define and decide a desired approach to managing each of the security challenges faced.

We will specify, design and develop a technical solution that can be further deployed to respond to the IV question in an accessible manner. It must address the core technical challenges and will include, but not be limited to the following:

- Use Case Definition
- Usability
- Accessibility
- Ballot integrity
- System security
- Intrusion detection and response
- Voter authentication
- Ballot verifiability
- Auditability
- Data security
- Coercion detection and response
- Testing

Usability
It is a key objective to not only create a solution for absentee military and overseas voters, but also to simultaneously address the challenging voting situation of remote disabled voters. We must meet the security needs in a way that includes all voters.

A detailed definition of the user experience, system features, functionality, look and feel, usability, reporting, and all other interactive aspects of the system must be documented.

Fundamentally, usability cannot be "layered on" as an afterthought in the development of any system. We also cannot expect a system to meet the needs of the disabled community if it is not designed for them. Instead, we will design our system with accessibility in mind from the start. Our goal is to lead on usability and developing a system that works for all voters.

C. Build/Buy Recommendation
A build versus buy decision will be required and taken into consideration in development of the specification. We will identify, review and evaluate existing E2E technologies in terms of technical capabilities, and in terms of whether the code can be acquired and used to form the kernel of the new system. Estimation of what is entailed both from a business

and technical standpoint in acquiring and actually using any existing technology, versus building from scratch will be essential in this decision.

D. Testing

As noted above, we are dedicated to ensuring that the system will be open and transparent. Computer code, communication protocols, and design decisions will be publicly reviewable. A means for public testing and evaluation is inherent to the program to determine whether the system meets the requirements. Our aim is a system that meets the requirements of both security experts and election officials, and one that the voting public will view as trustworthy and accessible.

Testing and evaluation scenarios will be described. The objective is twofold: to ensure that election officials have a solid understanding in lay terms of the technical issues involved in IV and can communicate effectively to the voting public that the requirements have been met; and to ensure that if a system meets the requirements, it will be viewed by the computing community as acceptable on technical grounds for use in voting. Who will conduct these tests and what the outcome will be must also be determined.

3. Business Plan

The technical specifications must be met by an equally serious business and marketing plan. A complete organizational structure for accomplishing this project in the development phases and beyond must be envisioned and planned. Staffing must be dealt with for short and long-term operations including engineering, product marketing, documentation, production, support, training, legal, and finance, human resources and general management.

Deliberation on the business aspects is essential to the success of the effort and will include identifying potential funding resources and sponsors, as well envisioning a long-term revenue strategy, be that self-sustaining or not, to maintain the program.

Although the intent may be that the technology is available through a nonprofit, Public-interest Corporation, the result of these efforts must be that the system can be provided, supported, maintained and managed within a self-sustaining business model.

4. Deliverables

The outcome of this Phase I effort will be a detailed, fully researched report, which addresses and provides recommendations for all of the items described above. The report will specify what we intend to create and test, how we intend to manage, staff and fund the project, and how the effort will be sustained and managed over time.

The Phase I report will detail the following project phases:

- Phase II – system development and testing
- Phase III – business and marketing program development

It is conceivable that Phases II and III are executed in parallel.

Final Note

As the founder of Overseas Vote Foundation, and someone who has been highly involved with the development and use of technology in this particular sector, I would be remiss not to point out how unprecedented this situation is in the election community.

The fact that such a broad range of computer scientists specialized in electoral policy and practice and committed to election integrity are currently willing to examine and propose a design and specification for a problem that has held our electoral industry in check for a very long time should be taken very seriously.

This would in effect be a "Nixon goes to China" sort of project that has the potential to unblock a critical impasse. In tech terms, this project would create what we call a "disruptive" development – one that changes the status quo, and moves it forward in a positive way.

Thank you for your opportunity to submit this proposal.

Appendices follow.

Appendix A

Potential team members include the following interested scientists and experts:

Ben Adida is Director of Identity at Mozilla. His passion is *autonomy*, empowering individuals with secure, private, and efficient access to their data. Ben has applied these principles to secure voting, personal health records, and the broader Web.

Josh Benaloh is a Senior Cryptographer at Microsoft Research. He has published extensively on cryptography and voting and is an elected director of the International Association for Cryptographic Research.

Duncan Buell is a professor in the Department of Computer Science and Engineering at the University of South Carolina. He has extensive experience analyzing data from ES&S iVotronics DREs and has served for several years as an election technology consultant to the League of Women Voters of South Carolina.

Dana Chisnell is an independent researcher currently working on usable security and research methods for social media usability, including extensive experience in ballot design and election system usability.

Poorvi Vora is an Associate Professor in the Department of Computer Science at George Washington University. Her research interests are in applied cryptography, voting, and privacy.

Dan Wallach is an Associate Professor in the Department of Computer Science at Rice University and the director of the NSF ACCURATE (A Center for Correct, Usable, Reliable, Auditable and Transparent Elections). His research involves computer security and the issues of building secure and robust software systems for the Internet.

David Wagner is a professor in the Computer Science Division of the Department of Electrical Engineering and Computer Science at the University of California, Berkeley, where his research is focused on computer security, especially of large-scale systems and networks.

Filip Zagorski is an Assistant Professor in the Institute of Mathematics and Computer Science at the Wroclaw University of Technology, where he conducts research in cryptography, security, and e-voting.

Appendix B

This is a list of states and counties to be contacted as potential participants. The list is not limited to the following. We would seek a minimum of 4 states and/or counties to participate.

Alaska – LG expressed concern for election integrity, strong military voter participation, long-term program to provide online tools to UOCAVA voters

California – next to New York, the largest UOCAVA state

Connecticut - has recently sought to change state law to allow for email ballot return

Selected Florida Counties – large military and overseas voter community. Many counties were 2010 EASE Grant recipients

Georgia – large military community

Kentucky – has recently sought to change state law to allow for email ballot return

Maine –state manages UOCAVA balloting centrally for 500 jurisdictions

Minnesota – committed to election integrity, strong military voter participation, long-term program to provide online tools to UOCAVA voters. 2010 EASE Grant recipient

New Jersey – looking for online solutions (post Sandy)

West Virginia – long-term interest in online voting

Travis County, Texas – currently working on the STAR Vote E2E polling place solution – very strong interest in this technology and this type of activity

Appendix C

Proposed Project Manager

BIOGRAPHY
Susan Dzieduszycka-Suinat, President & CEO
Overseas Vote Foundation and U.S. Vote Foundation

Susan Dzieduszycka-Suinat heads the Overseas Vote Foundation (OVF) and its associated initiative, U.S. Vote Foundation (US Vote). In 2004, Susan launched the first online voter registration tool for overseas and military voters. The initial pilot effort, known as Overseas Vote 2004, was immensely successful and in 2005 blossomed into the nonpartisan, nonprofit, public services organization Overseas Vote Foundation, which has become a force of change for overseas and military voter empowerment.

As its Co-founder, President and Chief Executive Officer, Susan is as much the visionary behind the organization as its day-to-day leader. Her work encompasses the foundation's strategic and operational planning, innovation and technical development, commercial and marketing programs. In addition, Susan is actively engaged with voter support, outreach, research programs and policy development programs.

Since its inception, and in spite of limited resources, OVF has spearheaded a complete transformation of the overseas and military voting landscape through its relentless pursuit of what Susan describes as OVF's "3D Strategy" of Development, Data and Dialogue [See Video]. These elements represent the structure of the OVF organization, which delivers robust technological innovation and development, survey research and analyses, and an annual conference program that builds OVF's greater network of people.

Susan orchestrates the work of the foundation around the greater goal of creating an environment conducive to positive electoral reform. This was realized in the 2009 passage of the Military and Overseas Voter Empowerment Act, and she has expanded her focus to include domestic voting challenges.

Susan has been an outspoken leader opposing unwanted overseas and military voting policies, which inspired creation of the successful CLOVE Initiative in 2012. She has actively participated in the efforts of the Uniform Law Commission to develop and propagate adoption of the Uniform Military and Overseas Voting Act across the states. OVF, through Susan's direct efforts, has been the recipient of grants from The Pew Charitable Trusts, the Carnegie Foundation of New York, and the JEHT Foundation. As an active public speaker, Susan often addresses the National Association of Secretaries of State and the National Association of State Election Directors, among other esteemed organizations. She has testified in Congress in support of overseas and military voting rights and was honored as a Google Fellow at the Personal Democracy Forum 2009 in Barcelona. She is a participating member of the Election Verification Network.

OVF's successful and innovative suite of software applications are the first of its kind within the U.S. are a direct outcome of Susan's vision for voter services that work within

today's security paradigm. She is responsible for the functional specification and ongoing development of the complete suite of Internet-based voter services available today. OVF's core engine and application suite greatly expanded in depth and breadth in 2012 when OVF executed on development grants for Minnesota, New York, and of Okaloosa County, Florida.

Susan's demonstrated ability to create and proliferate a standard for user-oriented voter services is expressed across the 18 websites run by the foundation. These include the Overseas Vote Foundation website, Youth Vote Overseas, state-specific sites for Kentucky, Ohio, Minnesota, New York and Vermont, county specific sites for Bernalillo County, NM and Okaloosa County, FL, and strategic voter outreach sites for the League of Women Voters, and Rock the Vote, among others. In 2008, Susan designed and proposed a strategic alliance program for FedEx Corporation, leading to the development of Express Your Vote, a discounted express ballot return service which has operated in over 90 countries for three general election cycles.

2012 heralded Susan's newest innovation: OVF's launch of a domestic voting effort, U.S. Vote Foundation (US Vote) [See Video]. US Vote adopts OVF's concept of a voter services site that provides customized web applications and information services. US Vote is the only website that gives domestic U.S. voters the ability to generate accurate and complete state-specific voter registration and state-specific absentee ballot request applications across all states. U.S. Vote Foundation piloted a Spanish-language initiative together with Hispanic Communications Network, Voto Ausente USA, across 12 states in 2012, and debuted its first hosted system for the National Association of Independent Colleges and Universities' Your Vote Your Voice program.

Prior to OVF, Susan was director of marketing for France and Spain for the worldwide leader in UNIX on PC-based systems, SCO, whom she worked for in various senior marketing positions for thirteen years. She founded her own marketing company The Dream Plan in Munich, Germany, which operated full-time from 2002 through mid 2004. Since mid 2004 and for the foreseeable future, Susan dedicates her complete time and attention solely to Overseas Vote Foundation and its affiliates.

Susan received a Bachelor's degree in environmental studies at the University of California, Santa Cruz and certifications in organizational development, large-scale project management and marketing from the University of California, Berkeley.

A native of Ann Arbor, Michigan, Susan and her family reside in Munich, Germany.

OVF Innovations Video 1:31m
http://www.youtube.com/watch?v=ybajqOX7d18&feature=share&list=PL96F43DEF5D3AEA4F

US Vote Launch Video 1:25m
http://www.youtube.com/watch?v=QSPF2z-ynSM&feature=share&list=PL96F43DEF5D3AEA4F