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The Official Quarterly Publication of the TrustTheVote® Project

OSET INSTITUTE

THE V○ PROJE

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IN THIS ISSUE

BUILDING THE PEOPLE'S VOTING SYSTEM

GREETINGS MEMBER/SUBSCRIBER—

Welcome to our 4th quarter review; what a year 2022 has been. As we reflect on '22 a couple of lessons have emerged.

Lesson #1: In order to actually trust the vote, we must believe in elections. And to that point, we can confidently say that trust is what black-box software demands; belief is what glass-box software delivers.

Lesson #2: The two principal problems in election technology infrastructure are opacity and obsolescence. Opacity is what enables misinformation and disinformation. Obsolescence is what is putting election technology infrastructure at stake and without commercial incentives to refactor that technology framework, we continue to sit on a ticking time-bomb before something actually is exploited due to inherent design vulnerabilities. It didn't happen in 2020 and it surely did not in 2022. However, 2024 looms.

All of this is due to a 20-year vacuum in innovation that our public benefit work is addressing. The result of our effort will be the **People's Voting System**.

The TrustTheVote® Project—made up of you, the members, and us as your technology developers—makes possible what has not been possible for 20 years: unbridled innovation in election technology.

While holding strong to the value of the durable paper ballot of record, we recognize that machinery is still required for many aspects of election administration. Creating voting systems that are verifiable, accurate, secure, and transparent has been a challenge due to the dysfunctional market and industry for this niche of government technology.
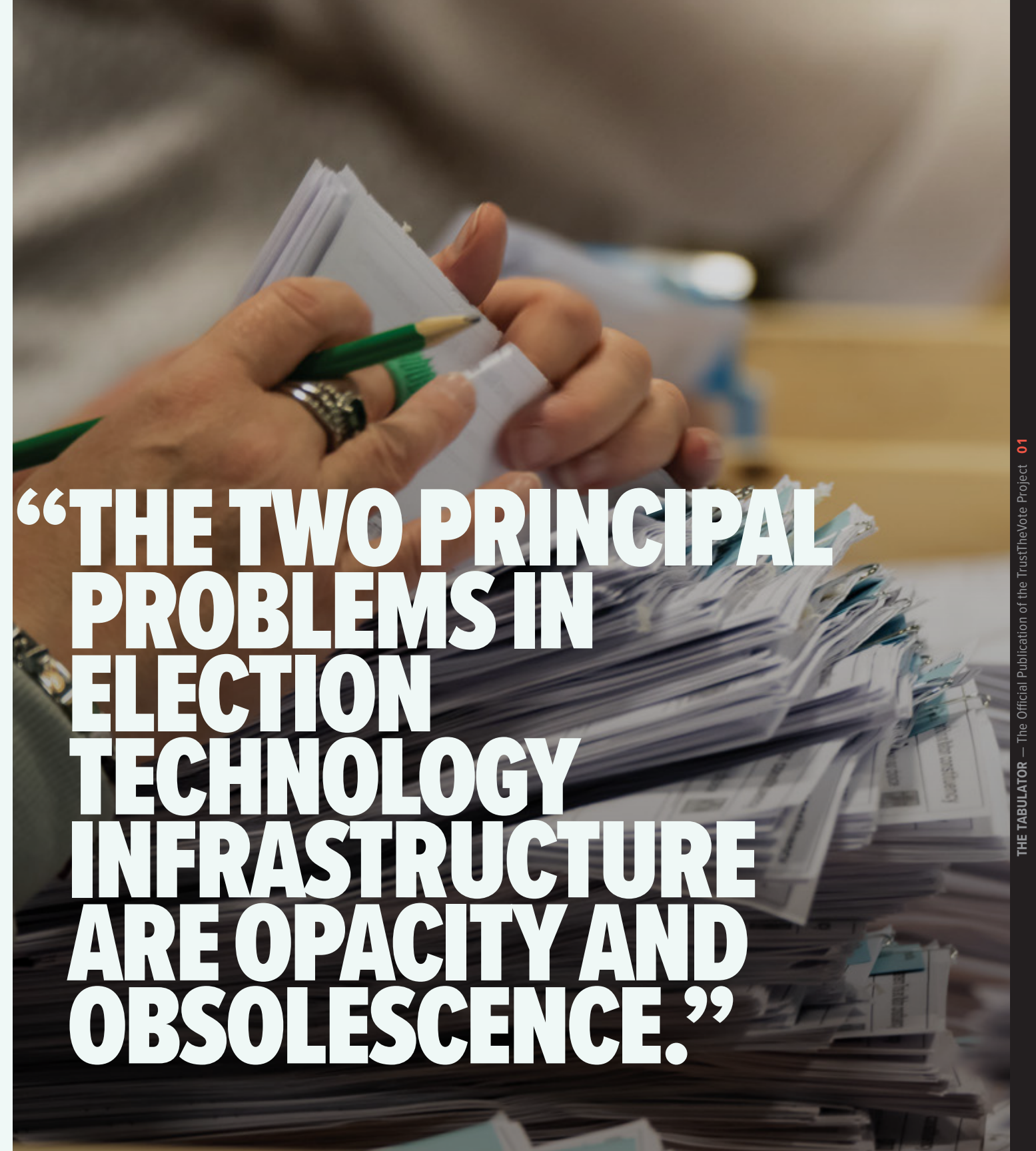
A key ingredient to accomplishing this is keeping you—our member community—informed. To that end, this issue brings it—interviews from election change-makers, progress reports from our technology foundry, and more. And here is our holiday treat for you: a way to share our story with your friends and family: an advance preview of a new 15-minute video presentation available at: https://vimeo.com/779769990.

Please watch and let us know what you think. ☑

Sincerely,

E. John Sebes
Co-Founder & Chief Technology Officer

> "THE TWO PRINCIPAL PROBLEMS IN ELECTION TECHNOLOGY INFRASTRUCTURE ARE OPACITY AND OBSOLESCENCE."

Technology

MISSION PROGRESS

WE LIKE TO REFER TO OUR WORK at the Trust-TheVote® Project as a "software foundry." We think the notion of a "foundry" is a good analogy. It evokes images of factories creating molds and precision cast parts. That makes sense because we're building sets of software building blocks used to assemble apps and services to innovate the administration of elections and the voter experience. Turns out there are a number of software development initiatives underway and not just the **People's Voting System** (ElectOS ™). Each quarter we update you on some of the most important projects underway at the TrustTheVote® Project.

Here is the 4th Quarter update in the order of their current effort level, with a priority flag next to each to inform you how important your support is now.

Green flag means the project is funded and rolling.

Blue flag means funding should be coming, but needs help to get it done.

Orange flag means we need funding help to stay on course.

Red flag means help is needed ASAP as this is a high-priority project.

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Mark-It
This is an absentee ballot marking tool for the ~38M voters in the U.S. with disabilities that prevent them from regularly participating in person. The project is nearing completion of the user interface for a mobile device such as a tablet. Early demonstrations are planned for late summer and work is expanding into support for multiple languages, ranked-choice ballots, open primaries and more.

Rocky
This is our oldest technology work—the 3rd party voter registration platform used by Rock The Vote and many others. Work continues in software development and support of absentee ballot request services, and a host of other service additions. The key importance here is the integration of this technology with States' voter registration systems so state officials can quickly receive applications and process them without the error-prone problem of re-keying in the data.

Grommet
This is the canvassing tools for mobile voter registration services at events, or on campus, for example. Work continues on robust reporting and performance analysis tools, support for the ever-changing flavors of the Android mobile OS as well as continued development on Apple iOS. Grommet is in full use now, and the workload is keeping up with any technical issues in the field.

RCTab
This is the open-source ranked-choice vote tabulator that is rapidly growing in popularity and was used to conduct several RCV elections this past cycle including the Mayoral race in NYC. The TrustTheVote® Project through its parent, the OSET Institute has partnered with the Ranked-Choice Voting Resource Center to rapidly accelerate improvements and enhancements with adoption growing rapidly. Work is underway now, as well as potential for licensing the software to commercial voting system makers. Stay tuned!

Vanadium™
This is the ground-breaking ledgering system that wraps and "securifies" existing state voter registration database systems with a block-chain class technology to eliminate the risks of external cyber-attacks. Vanadium technology could one day completely redefine voter registration systems, making them faster, more reliable and efficient, as well as providing a tripwire service to detect efforts to compromise the data. Work is underway to deploy several pilot installations in time for the 2024 general election.

VoteTracker+™
This is a super-exciting, and somewhat exotic breakthrough technology that is in the lab at a very early stage of development, but we think you're going to love this. Imagine the ability to go to a service to verify that your ballot has been counted as cast, once you've finished casting that ballot? Well, at a very high-level of explanation that's it! The system is currently in design with lots of early testing. There is a lot of cryptography, and exotic tech to make it work, and the researchers are using the popular software administration service, GitHub as a unique testbed. All signals are "go" to launch crowd-funding to build the actual pilot, so please watch for that as another important election verification tool you and our team can put forth to increase confidence in elections and their outcomes!

VoteReady™
So, if you think VoteTracker+ rocks, hold up, because VoteReady is already rolling out as a back-end service for monitoring changes to voter-rolls, and soon will be available for your own mobile device. VoteReady is like "LifeLock®" for your voter registration. The moment a change occurs or is about to happen to your registration record or status, your mobile device gets an alert. We're now in the depths of development of the Android and iOS app; the service is already essentially built. Your support of this project can help ensure we get this into voter's hands. Contact us to learn more.

Guthrie
One of the most important pieces of technology to trust the vote is apps and services to perform post-election verification using a process called "risk-limiting audit." Guthrie will be a software appliance that operates in the cloud to make freely available to all jurisdictions the software to perform post-election results audits. The project is in collaboration with UC Berkeley and the inventor of RLAs, Dr. Philip Stark. We are raising additional funds to cover engineering costs for the new software development effort, which are likely to be matched by larger donors and grants if we can demonstrate a groundswell of public support. Guthrie is critical to trusting elections and believing in the outcomes going forward, especially for 2024. Contact us to learn more.

ElectOS™
This is the people's voting system and our flagship initiative we need to finish by 2024. We're actively growing funding for this work which is an open-source software platform for the casting and counting of votes. It covers ballot tally and tabulators, the election management system, the ballot printer, and for those who need or want it, a ballot marking device. All of these components (and some other software) make-up the People's Voting System. The underlying hardware, where required, will be off-the-shelf components from American companies like Dell, HP, and Intel with some security verification modifications and ElectOS embedded. Current work is focused on the important and complex parts of trustworthy boot (start-up) and hardware integrity verification. ☑

15 Minutes with
Elections Expert

DAVID LEVINE

by Gregory Miller

Our feature interview is with David Levine, Elections Integrity Fellow at the Alliance for Securing Democracy of the German Marshall Fund. David is a non-practicing lawyer and previously, the Ada County, Idaho Elections Director. David focuses on election access, trust and security, external threats from malign actors and the challenges democracies face in conducting free and fair elections. David's work has been published in NY Times, Washington Post, NPR, Bloomberg, BBC, and others.

Tell us about the Alliance for Securing Democracy; and how much of its work is US-centric vs a global effort?

The Alliance for Securing Democracy (ASD) is a nonpartisan initiative housed at the German Marshall Fund of the United States (GMF), which develops comprehensive strategies to deter, defend against, and raise the costs of autocratic efforts to undermine and interfere in democratic institutions. ASD has staff in Washington, D.C., and Brussels, and it brings together experts on disinformation, malign finance, emerging technologies, elections integrity, economic coercion, and cybersecurity, as well as Russia, China, and the Middle East, to collaborate across traditional stove-pipes and develop cross-cutting frameworks.

Much of our work focuses on the United States and its democratic partners in Europe. We are committed to the idea that the United States and Europe are stronger together, and we champion the principles of democracy, human rights and international cooperation, which have served as the bedrock of peace and prosperity since the end of World War II but are under increasing strain.

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"THE MIDTERMS AVOIDED THE WORST-CASE OUTCOMES BUT VIGILANCE IS STILL NEEDED."
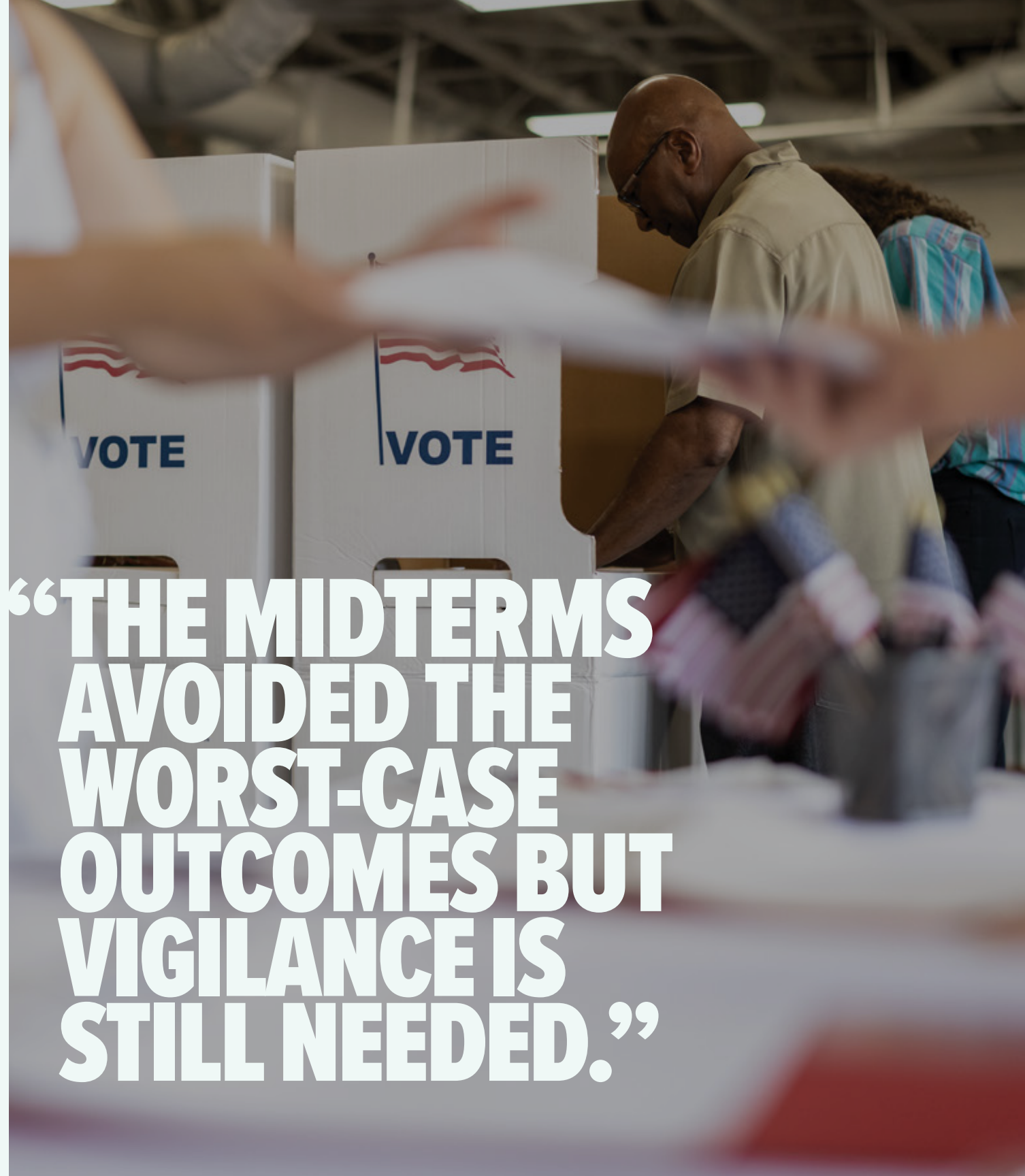
That said, we also recognize that issues critical to transatlantic interests in the 21st century go well beyond the transatlantic region. For example, concerted efforts by malign actors to undermine democratic processes and erode democratic institutions pose a foundational threat… not only to the United States and its democratic partners in Europe, but Asia and elsewhere. External threats from authoritarian governments have coincided with internal challenges from domestic actors to weaken democratic norms and institutions all over the world, and we are increasingly working with partners in countries across the globe to uphold democracy's foundational principles and counter autocratic efforts to exploit discord and undermine democratic institutions.

Many say we dodged a bullet in the midterms insofar as the chaos that could have occurred, how do you see it?

To quote a recent piece from ASD's co-directors, Rachael Dean Wilson and Dave Salvo, "The Midterms avoided the worst-case outcomes but vigilance is still needed."

On the one hand, there were some encouraging signs from the midterms. For example, most election-denying candidates who ran for governor or secretary of state lost in 2022. Voters in many of these states decisively rejected their attempts to undermine democracy, and as a result, many of the most important offices overseeing the integrity of the 2024 presidential election will be filled by individuals who say they put free and fair elections before partisan interests. Additionally, most candidates, including some election deniers who lost their races, conceded in a timely, unambiguous manner. As the January 6, 2021 attack on the U.S. Capitol showed, a peaceful transfer of power is critical to a healthy democracy, and these concessions are hopefully a sign of a return to a longstanding norm in American politics. Finally, thanks in large part to the work of election officials, law enforcement, civic groups, and others, violence largely failed to materialize during the midterms.

On the other hand, there are a multitude of threats that remain. For example, election denialism continues to play a major role in American politics. During the election, denialism groups improperly challenged voters' eligibility, monitored and intimidated those using ballot drop boxes, and sought to infiltrate the selection and training of poll workers. Online disinformation grew. Attacks on election officials persisted. And in some instances, local officials themselves sought to refuse to certify legitimate election results or undermine confidence in results. And while many election denying candidates suffered losses, others also won races for offices that will play a role in overseeing future elections.

I think the bottom line is the 2022 elections were conducted in a free and fair manner, and the midterm results—in terms of process and administration—were far better than they could have turned out. However, popping champagne corks at this point would be premature. There is a good deal of work to do between now and 2024.

We definitely agree with that, which is a segue to the next question. We know there are inherent design vulnerabilities in today's voting technology, but so long as the perimeter is secured, those vulnerabilities cannot be exploited. However, over 2021 and 2022 we witnessed this perimeter compromised by inside actors such that copies of proprietary software were released. Now what? What needs to be done to prevent this from happening again?

As you alluded to, physical access to some election infrastructure makes it more likely that an adversary will be able to find a vulnerability. And, in addition to being a direct security risk, breaking chain of custody for voting technology can, in and of itself, result in future vulnerabilities.

Additionally, the disclosure of the underlying technology that makes up election systems also increases the risk that an adversary could detect a vulnerability. As the Center for Internet Security and others have noted, patch levels, configurations of systems and

software, and other information about the makeup of election systems could be used by attackers looking to find a way to compromise the system. I know the OSET Institute has made these points as well.

Due in part to the rise in election offices being asked to turn over voting equipment for third party audits, the security breaches that have been reported at local elections offices involving improper access to sensitive voting technology, and other factors, I believe we need a new vision for election security. One that not only accounts for the capacity and desire of external actors, such as hostile foreign governments, cybercriminals and bad-faith domestic actors to undermine the credibility of election results, but potential insider threats as well.

While the U.S. has repeatedly demonstrated its ability to administer free and fair elections in challenging

future elections. That is something we are interested in potentially working with the OSET Institute and others to develop.

Given your focus and vantage point in helping shape election administration public policy, how important is public trust in the machinery of voting to the security of elections?

Public trust is *paramount*. As we saw with the January 6, 2021, insurrection on the U.S. Capitol, if there isn't public trust in the machinery of voting, all bets are off.

Election security involves at least three policy goals: First, *access*—ensuring that all eligible voters who want to vote can do so. Second, *security*; ensuring that elections are free from criminal and other malicious activity, disinformation, and cyber-interfer-

"AS WE SAW WITH THE JANUARY 6 INSURRECTION, IF THERE ISN'T PUBLIC TRUST IN THE MACHINERY OF VOTING, ALL BETS ARE OFF."

environments, the ever-growing threat landscape demands that we continue working to bolster the security of elections against autocratic actors. The challenge of election security is to ensure that no attack exceeds our ability to detect and recover from it, and the recent emergence of additional threats, both external and internal, has lent greater urgency to ensuring that election officials know their current potential vulnerabilities as well as options for protecting the integrity of their systems. An updated assessment of the threat landscape with ideas for how to counter these threats could give election officials and their partners a clearer idea of what is necessary to help ensure the security of U.S. election systems for

ence. Third, *integrity*—ensuring that the conduct of elections is perceived as legitimate across the political spectrum. If we can't achieve all three, the likelihood of conducting a successful election becomes increasingly difficult, and there's potentially no better example of this than the 2020 presidential election.

The 2020 election had the highest voter turnout of the 21st century and the highest turnout since 1900, and its security was attested-to by the nation's top intelligence and law enforcement agencies, judges, and others, including the Department of Homeland Security—Cybersecurity and Infrastructure Security Agency (CISA), the Department of Justice, the Courts, top election officials in nearly every state, and notable

[election security experts](#), which I know OSET Institute intended to sign-on to, and several of your Board advisors did. Unfortunately, such facts and statements did little to dissuade former President Trump and many of his supporters from [seeking to overturn the 2020 election](#), efforts that led to the violence at the U.S. Capitol.

What do you think is necessary to restore belief in elections and their outcomes?

Robust education and awareness campaigns on how elections really work; consistent, dependable investments in systems, processes and procedures that support evidence-based elections, so that election officials can present demonstrable evidence of the accuracy of the entire elections process; a whole-of-society effort to combat election mis-, dis- and malinformation; and greater accountability for those who seek to cast doubt on the integrity of U.S. elections without justification.

What are your top two or three concerns for the security of the 2024 election cycle?

Top of the agenda must be the security of election personnel: I'm concerned about the well-being of election workers–top-to-bottom... including state and local election officials, IT staff, and temporary staff, such as poll-workers, all who have the unique knowledge, skills, and abilities to administer U.S. elections. As recently as a month before the midterms, law enforcement reported that they were continuing to see unusual levels of threats to election workers in seven states, and since 2020, there has a [robust effort](#) by some partisan actors to infiltrate the poll worker training and selection process in jurisdictions across the country so that their ranks include individuals who may be willing to break the rules to help their side win.

Between the escalation of attacks on election officials, and the fact that so many are eligible to retire before 2024, I'm concerned about a continued exodus of top election officials, which would drain the election system of experience and institutional knowledge at

the very time it needs it most: when many bad-faith actors are looking to seize on any actual or alleged mistake to further erode public faith in elections.

Second, is the information environment. The Aspen Institute Commission on Information Disorder noted in its [November 2021 report](#) that Americans are in a crisis of trust and truth, and there's little to indicate that things have improved markedly since then. Our information ecosystem is continuing to fail the public in a number of respects, and the absence or loss of trust in democratic institutions, democratic processes, and journalism, combined with a growing number of bad-faith actors who exploit these weaknesses, continue to lead to real harms, often with significant consequences for those not only working in elections, but other non-partisan, qualified professional organizations as well. If we can't take significant steps to address this information disorder, our democracy is likely to continue to remain under assault, regardless of how secure and accessible we make our elections.

Finally, the security of U.S. election infrastructure. There are a number of steps that have been taken to improve the security of U.S. elections, particularly since the 2016 presidential election. These include, but are not limited to, the phasing out of paperless voting systems, greater federal efforts supporting election officials in improving the security and resilience of their systems, and more information sharing about potential threats to elections across the election community.

That said, the threat environment only appears to be getting more complex, and it's far from clear whether all key U.S. stakeholders truly appreciate this. To give just one example, it's great to see Congress on the cusp of passing Electoral Count Act reforms that can help prevent what happened in 2020 from recurring in 2024.

On the other hand, in what is perhaps [the last chance for election funding before 2024](#), Congress is set to pass a year end spending bill with only $75 million in election security grants after providing only $75

million in 2022 and nothing in 2021. At a time when election officials need to replace aging election systems and keep up with the increasing costs in their budgets that include everything from sprawling security needs to the rising costs of everyday items like ballot paper, $75 million is, at best, a drop in the bucket.

If the Alliance (ASD) had a "democracy doomsday clock," akin to the nuclear doomsday clock, what time would it be for global democracy?

(*David chuckles*) Great question. And we should probably make one, if one doesn't already exist. Seriously, though, with regards to a time for global democracy, I'll have to defer to others.

On the one hand, democracy continues to be under assault around the world. Many democratic governments continue to struggle to close the gap between their institutional performance and their citizens' expectations, a gap that has in some cases been exacerbated by crises like the lingering pandemic, current wars, and a looming global recession. And unfortunately, long-held assumptions like the legitimacy of credible electoral processes are no longer as ironclad as they once were.

On the other hand, authoritarian regimes and their alternative systems of government are experiencing their fair share of challenges as well; whether its emerging discontent at the continuous stream of

Chinese lockdowns for Covid-19, the thousands of draft dodgers fleeing Russia's brutal invasion of Ukraine for uncertain futures elsewhere, or women in Iran protesting the country's theocratic dictatorship.

At a time when the number of people who believe that democracy can help solve the world's biggest problems is diminishing, I remain hopeful, if only because genuine democratic institutions are generally far better positioned to respond to the needs of its citizens, particularly in times of crisis and fear. That said, the future of global democracy will rest with the people, not democratic processes or institutions, above all else.

Last question: with all that in mind, what are the Alliance's top priorities for 2024?

The Alliance's top priorities are keeping up with the evolving capabilities of democracy's adversaries, working with small "d" democratic partners to combat them, and ensuring that there is sufficient awareness amongst the key stakeholders on these issues. As International IDEA noted in its [Global State of Democracy Report 2022](#), the bad news is that democracies across the world are struggling in the face of a rapidly changing global context. The good news is that there are mechanisms out there that can be put in place to help ensure democracies can better respond both to the evolving capabilities of its adversaries and the evolving needs of its citizens. ☑

Midterm Recap

A BULLET DODGED

by Genya Coulter

Democracy dodged a bullet in 2022 and the midterm elections reflected the clear desire of American voters to regain a sense of normalcy by harnessing the transformative power of civic participation.

While election offices were largely spared the twin cyber-migraines of ransomware and denial of service attacks, the fallout from 2020's "Big Lie" and 2021's politically-motivated "forensic audits" put a great deal of pressure on election administrators in many states to prove that the election process was not rigged. This led some election officials to allow unauthorized access to election systems and servers by unqualified examiners, who did not follow accepted chain of custody procedures. As a result, those jurisdictions were forced to decommission voting equipment that had been tampered with, and replaced with clean equipment, putting an additional burden on taxpayers to cover the cost.

During a high-stress pre-election lead-up that ran the gamut from death threats, to seemingly unending legal battles pitting election officials against well-funded election denialists,vigilante activists stalking ballot dropboxes with AR-15 rifles, to a nationwide ballot-paper shortage, the election community readied themselves to face the proverbial firing squad.

Somewhat unexpectedly, despite the supercharged political atmosphere, 2022 did not give way to a complete electoral meltdown in the vast majority of states. Overall, the US midterms went more smoothly than anyone anticipated. Even if the American election process isn't completely bulletproof, it is generally functional and far more resilient than it receives credit for.

Turnout was the third-highest for any election in the past 20 years, with female voters and voters in the GenZ demographic turning out to vote in record numbers. Even a slew of stricter voting laws in six states did little to deter a motivated voter population galvanized by controversial decisions in several high-profile legal cases. Voter confidence in their election officials has improved significantly since 2021, and for the first time in several decades, the majority of American voters vote using a voter-verifiable and auditable paper ballot. Post-election Risk Limiting Audits have moved from relative obscurity to household discussions about their importance in verifiable and accurate election tabulation. Ranked Choice and Instant Runoff Voting options performed well under pressure, and at least two states are considering a switch to IRV to avoid expensive, labor intensive runoff elections.

In a surprising development, several of the most vociferous election denialists were willing to accept their losses this time. The main takeaway here is that convincing voters that they should vote on Election Day only, and not use Early Voting and Vote By Mail (when over 60% of US voters already vote prior to Election Day) was not only a questionable campaign strategy, it backfired for voters who encountered technical or logistical difficulties on Election Day.

The most irksome issues affecting elections this year were comparatively quotidian: voter confusion over decennial redistricting, sharp decreases in the number of both pollworkers and available polling places, long wait times in metropolitan areas, aging peripheral components of voting equipment pushed past end of life stage, and a startlingly high occurrence of ballot and vote by mail envelope misprints across the US, continuing an unfortunate trend that began earlier during the primaries. One of the factors that played a part in ballot woes? A supply chain issue that impacted the availability of preferred weights of paper and ink for commercially printed ballots and envelopes. To compound matters, the manufacturer of the most widely used ballot-on-demand printers in states that use a Vote Center style model withdrew from the North American market.

2024 is less than two short years away, and 2023 is not the time to exclaim "Ha, Ha! You missed me!" Complacency about our democratic ideals is how America was led astray by the "Stop The Steal" movement. Complacency about how our democratic process is administered and executed is how we wound-up with preventable technical problems that betray the trust our voters place in elections. Designing and building voting systems that provide voters with verifiable and accurate election results in a secure, transparent manner seems like a worthy investment to keep us out of the line of fire. Onward to '24. ☑
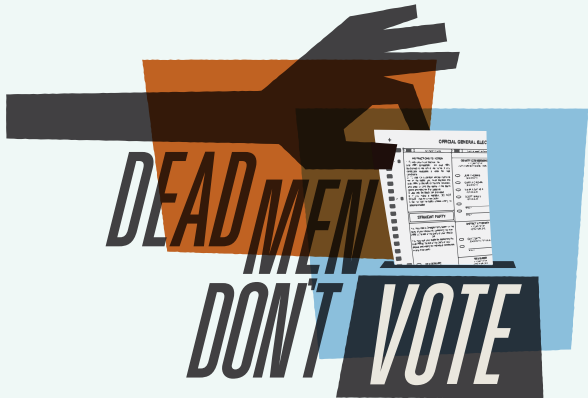
DEAD MEN DON'T VOTE

The Official Podcast of the TrustTheVote Project

Gregory Miller   Cameron Quinn   John Sebes

Join Us!

TRUST THE VOTE PROJECT

"The OSET Institute is bringing a strong voice for the people to its TrustTheVote® Project with their 'Dead Men Don't Vote' podcast. This will be the show for important and timely conversation about how America conducts elections—the good and not so good—and how to make it work better."

– Joe Trippi, Host of "That Trippi Show"

TRUSTTHEVOTE.ORG/PODCAST

MATT BEATTIE

by Genya Coulter

Matt Beattie joined the team in June 2021, and is a Senior Member of the Technical Staff - directing Software Engineering Effectiveness & Productivity at the OSET Institute.

You're the leader of a team ensuring software quality, productivity, and development effectiveness. That sounds important, yet a bit complicated, but a role we hope all software operations have. Can you tell us more about your role, and its importance for this type of R&D?

Modern software development tools enable engineers to be lazier than ever. Do you need to create an application for a specific use-case? Pull down a sample set of source-code and get started molding it to your needs. What if you want to borrow someone else's source code? There are tools like GitHub Copilot and ChatGPT that will automatically generate so-called boilerplate or generic code for the task. But the Institute's software R&D goes way beyond that.

For the TrustTheVote® Project, we're working on production-grade never-before-built software; in some cases, subject to federal and state certifications,

which requires rigorous testing. We contribute to the National Institute of Standards and Technology's (NIST's) process of developing election technology standards, and carefully implement them into software under development. These systems need to talk to each other, at both human and machine levels. So my work helps us make sure we—the humans, and it—the software, all speak the same language. That means architects, engineers, and developers all understand the standards and how to apply them, and all of our software fully and correctly implements those standards. So, we've built automated quality checks into our software practices, to ensure developers can move fast while also not breaking things. We've built and continue to build-in standards, automation, and enforcement into code contribution, so that engineers and developers can focus on the difficult things while the machines handle the rest. And we're doing this all in GitHub—the global software repository and management service, which offers world class tools for collaboration, code sharing, and automation.

And we have plans to implement NIST-standard "risk

management frameworks" to ensure the security and integrity of our source code trees. This work will keep me busy. In fact, we recently applied for a National Science Foundation grant to ensure a sustainable development ecosystem, starting with our software development management of the RCTab Project for ranked-choice voting used in several states.

Why do you believe public technology or open-source is important for democracy administration in general, and election administration technology in particular?

Let me start by contextualizing that a bit. The typical election administration process life-cycle in the U.S. is complex—a bit simpler in parliamentary govern-

ments abroad where we're also working. Diagramming and visualizing the processes to be re-engineered is imperative. And so I've seen diagrams outlining the processes and systems, and they're non-trivial. One should be able drill into each successive "next level of detail" to verify the actual technology implementation. That's our vision and supports our mission to "increase confidence in elections and their outcomes." That traceability is incredibly important because transparency builds trust.

So, to your question, public technology, or open-source is essential to ensuring trust, but even more importantly, belief. Our approach, as I just described, helps build belief in how those processes

work. So, open-source is critical to all aspects of democracy administration, especially election administration systems. And witnessing recent election chaos, clearly we must demand more transparency.

For example, a voter should be able to follow their ballot throughout the various systems, and eventually see where—and how—it gets counted. Today, we have ballot tracking for by-mail voters, but why don't we we go further and provide an independent means to verify your ballot was counted as cast? Similarly, election officials and observers should be able to inspect the ballot and election lifecycle technology without any opacity or black-box "trust us" components. By building the system as public technology

"BY BUILDING THE SYSTEM AS PUBLIC TECHNOLOGY EVERYONE CAN SEE AND UNDERSTAND THE PROCESSES AND THE SOFTWARE ADMINISTERING THOSE PROCESSES."

everyone can see and understand the processes and the software administering those processes. This decreases misinformation and disinformation, and increases trust and belief. Public technology invites everyone to inspect the source code, ask questions, identify errors or bugs, and catalyze a community of support around the digital processes of election administration. The result is a much more hardened and resilient system that we all can believe in. That's what we're doing in making the People's Voting System, and that's why open-source matters.

OK, two-part question... Given your specialty is ensuring maximum developer productivity which should impact software integrity and assurance,

There are two ways to deliver software. Either you brute-force just start writing and deliver the App—kinda like you'd write a piece of sheet music or a recipe for a cake. The second is to create a repeatable process for building software, and then use that process to iteratively deliver all kinds of Apps. Creating and maintaining that process has a higher upfront cost, but the resulting dividends scale with the effort you invest and that's because a highly iterative process with the tools in place to accelerate high-quality development, means we get to a better result faster.

I'm leading the build-out of a system to streamline and standardize the development process. Code changes are automatically run through quality checks before they can be considered for a process called merging; that simply means incorporating code into production-ready systems. Tools and frameworks—think development scaffolding around a new building—are built into the development workflow, enabling engineers to get fast feedback on their changes without needing to engage the core development team until everything is passing and ready for manual review. This system allows any number of contributors to work on the project, while ensuring that code quality and core application functionality is maintained across all changes.

Last question: What excites you the most about the projects you're working on at the OSET Institute?

The enormous scale of this project combined with its potential for profound social benefit. One of my first tasks was to combine three demo Apps into a single voting application. So, I created a mono-repository, which allows us to compute a dependency graph of all the software libraries used in the Apps (*Ed Note: see diagram below*). As I was introduced to other engineers working on related projects, the scale of what we're building came into focus. And that means there are other subsystems yet to be built, or are being developed that I have yet to learn about. As a result, I am slowly gaining appreciation for the lifecycle of election administration; and that's an exciting learning process. ☑
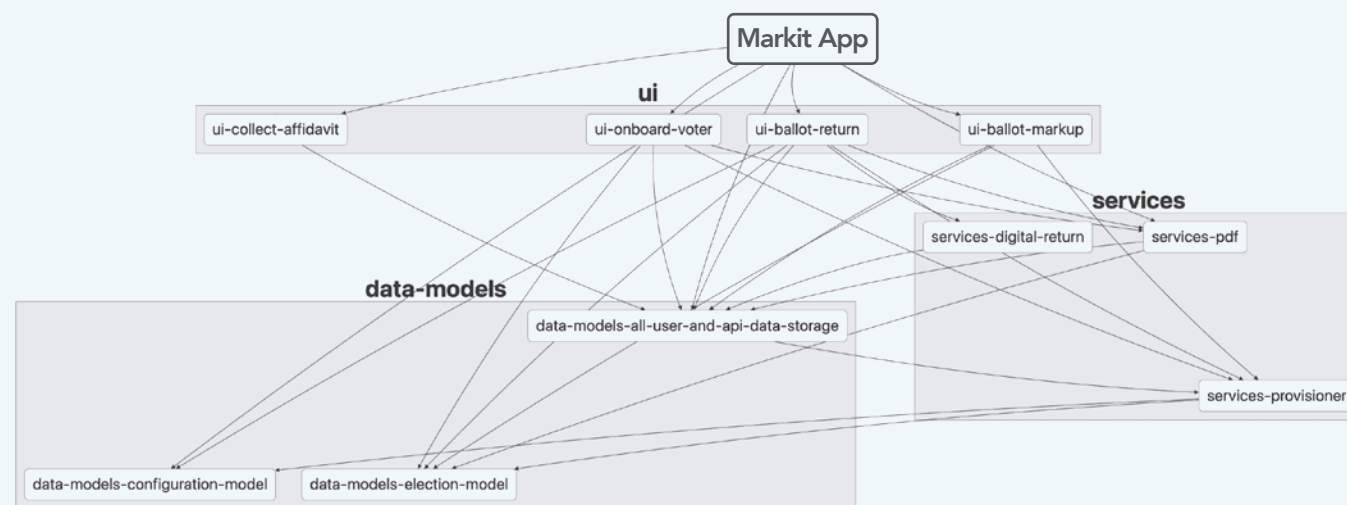
Graph showing voting software library dependencies.

"AFTER WITNESSING RECENT ELECTION CHAOS, CLEARLY WE MUST DEMAND MORE TRANSPARENCY."

Donor Spotlight
"JOSH S."

Josh S. (last name withheld by request) is a significant monthly supporter of the OSET Institute since 2021 and well beyond the annual $25 membership. Josh is a senior-level software technology executive working in the automotive industry. He considers himself a moderate in all things. Josh is an engaged voter, agrees with the label "pro-democracy" and is concerned about the instability of our elections infrastructure and loss of trust in the processes. Gregory Miller, our Chief Operating Officer, caught up with Josh to chat about his support of the OSET Institute and TrustTheVote Project.

Josh, it's great to have an opportunity to learn some more about your support; thanks for agreeing to talk.

No problem; happy to; this is important stuff.

What made you first decide to support the OSET Institute and TrustTheVote Project?

Well, let me think back; you know I've been giving to the cause for a few years now and I think that goes back to 2018 and after that midterm... given concerns in 2016 and then especially in 2020... I was struck by a nonprofit project to actually address the technology of voting itself–it just makes so much sense and I was surprised there really wasn't another project like it at the time.

Thank you so much for your dedication to the cause; actually our records show it's been 4 years. What prompted you to get more deeply involved?

Well, like I said, over the previous Administration's term I grew increasingly concerned that voting machinery was ripe to be blamed for an election outcome the loser didn't believe. Rumors had been flying for years of irregularities and it seemed obvious that the technology should be transparent. When the former President began suggesting early on in his re-election effort that if he didn't win it would prove the election was rigged, I became convinced we had a problem, because after all, with his level of security clearance he clearly would be in a position to know things. That deepened my interest in the TrustTheVote Project. And then look at what happened in 2020 and after.

So, you were concerned about voting machines being hacked?

Well yes, but I was increasingly concerned that even if they weren't, so long as the technology is proprietary and closed it would be impossible to prove election systems were not hacked. With the papers and other content the Institute was publishing about all of this my commitment to the cause really strengthened.

With that in mind, why do you believe that giving to

the Institute, and the TrustTheVote Project is so important?

In my job I regularly work with open-source software. I am very familiar with the benefits of mission-critical software being totally transparent. In reading materials on your sites like the *Theory of Change*, I totally agree, as a technologist in the commercial sector, that without any commercial incentive to invest in the required R&D and innovation to strengthen the integrity and security of voting machinery it just won't happen. By building this and flooding the market with the technology, the changes we need are nearly assured to happen. Again, given my job in automotive

"A NON-PROFIT PROJECT TO PRODUCE THE PEOPLE'S VOTING SYSTEM IS TOTALLY WORTH SUPPORTING."

innovation, I can say with certainty if you build it and it is freely available, it will be adopted and used.

So is it safe to say you agree that the transparency quotient is a high priority?

Absolutely. Clearly, proprietary black-box technology requires you to trust it, but open-source glass-box technology empowers you to trust it. Any non-profit project that is trying to produce this technology as open-source, applying fault-tolerant engineering practices, and going through all the effort to get it certified is worth supporting, for sure.

Well, clearly we agree with you, and so my last question, what is it about the work of the OSET Institute and TrustTheVote Project that you believe can change that?

Definitely the concept of "Building the People's Voting System" is huge. And for me, it's the level of talent your team has and is attracting, and the fact that your project is performing some serious design and engineering R&D. The companies from which you've attracted talent says a bunch. And the balance of technology professionals and elections professionals is reassuring that the work is really putting users–voters and officials alike–at the center of the effort.

Yes, we're very fortunate to have a stakeholder community behind this effort providing the requirements and specifications for what they need to

produce a trustworthy system. OK, so one last thing, can we assume you encourage others to support this work?

Definitely. Seems to me that if you can reach the masses ...and it probably doesn't take that many... the balance of your funding requirements should be easy to attain.

Josh, thanks for taking the time to speak with us about your support for the OSET Institute and the TrustTheVote Project. You're a cherished supporting member of the Project and your name will join all of those who support this work— recorded in the master copy of the ElectOS software source, which we intend to be stored in the U.S. National Archives when complete. ☑

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