PROFESSIONAL PRACTICE PROGRAM
35TH ANNUAL NATIONAL CONFERENCE - ORLANDO, FLORIDA

2019 AWARDS

PROFESSIONAL PRACTICE PAPERS
IN ELECTION ADMINISTRATION AND VOTER REGISTRATION

We thank all our colleagues who took the time to share their best practices this year. These papers show a commitment to our profession and the desire to always improve. To work in a profession like ours, filled with people that perform their duties with dedication, vision and willingness to share their success is truly an honor.

Please take some time to review these great ideas and consider how they may benefit your jurisdiction.

Jill LaVine, CERA, Chair Professional Practices Committee
Grace Wachlarowicz, CERA, Professional Practices Committee
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Dawn Williams, CERA, Professional Practices Committee

DEMOCRACY AWARD WINNER – Outstanding Practice of 2019

Enhanced Security and Access for UOCAVA Voters

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2019 Professional Practices Program

Enhanced Security and Access for UOCAVA Voters
Denver Elections Division, CO

Submitted by:

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Executive Summary

The Denver Elections Division partnered with Voatz, Inc., Tusk Philanthropies, and the National Cyber Security Center to pilot a blockchain-based mobile voting application for the Denver municipal election cycle in 2019. The application was available only to voters who qualify under the Uniformed and Overseas Citizen Absentee Voting Act (UOCAVA). The goals of the pilot were to provide a more convenient method by which military and overseas citizens could vote, and to provide a more secure method of returning cast ballots than other electronic delivery methods available. Survey responses showed voters overwhelmingly preferred to vote using the app than by any other means.

We also helped to develop a third-party audit tool hosted by Voatz through which election observers could conduct an independent audit of the ballots cast through the blockchain app and verify the votes were recorded and tabulated correctly. The audit offered observers full access to independently verify the election outcome, and suggests the potential benefits of end-to-end verifiable elections.

Easier Access and Enhanced Security for Remote Voters

In preparing for our 2019 municipal election cycle, the Denver Elections Division sought a solution to the unique obstacles facing overseas and active-duty military personnel and their eligible dependents. While UOCAVA voters can access their ballot electronically through a web-based platform, this "one size fits all" approach does not address voters' lack of access to certain technology. Traditional electronic voting methods require access to a printer or scanner; even if a voter is able access their ballot they face a secondary obstacle of properly signing and returning the affidavit.

Another challenge for UOCAVA voters is ensuring their cast ballot is securely returned. Traditionally, UOCAVA voters who opt to return their voted ballots electronically must send them as PDF attachments to email. This is perhaps the most unsecure return method available and offers no assurance that their ballot is counted correctly. In statewide elections, the Colorado Secretary of State hosts a secure file transfer site for UOCAVA voters to upload their voted ballots, but this method does not resolve all potential security risks and is not available for Denver voters in home-rule elections.

Blockchain offers enhanced security over email and other electronic methods of return. Because blockchain is a distributed digital ledger of data transactions, mobile votes become immutable and tamper-proof once recorded. In the unlikely chance a hacker has the money and expertise to compromise a blockchain, its distributed nature would create so much digital noise as they move through it that a security team would be alerted well before they reach their intended target. When combined with the latest advances in smartphone security technology (e.g. biometrics and hardware-based encryption for data transmission over the internet), mobile voting via blockchain is more secure than other methods of electronic return currently available to UOCAVA voters.

Conducting the Pilot

To test the convenience to UOCAVA voters, we solicited volunteers to participate in the pilot. Voters who signed up were added to the Voatz database and received instructions on the 45th day before the May 7th election on how to download the mobile app and verify their identity. The identity verification step involved inputting basic voter identifying information and taking a photo of a government-issued photo ID, such as a driver's license or passport. Next, they took a 10-second selfie video. The photo and video were then used by facial recognition software hosted by Voatz that matched the voter's photo ID to the video. This process usually took only a few minutes, and none of the photos or videos are stored by Voatz for longer than 24 hours.

When the facial recognition portion is finished, the voter is then able to access their ballot, mark their selections and proceed to sign the affidavit directly on the phone's touchscreen, effectively eliminating the need for any secondary technology. The voter then uses their biometric fingerprint as registered in the phone's internal security to cast the ballot. Once a voter submits their ballot, the voter receives a digital receipt showing his/her ballot selections. If a voter noticed something amiss, he or she could immediately cancel the vote and receive a new ballot through traditional methods.

Our office simultaneously receives an anonymized copy of the digital receipt as well as an email containing the signed affidavit. The UOCAVA processing team is then able to print the affidavit and proceed with signature verification. The cast ballots are housed in a separate Voatz dashboard, only to be accessed in bulk at the time of audit. The dashboard requires two designated users to sign-in simultaneously to download and print the ballots directly onto ballot stock for scanning and tabulation with all other ballots cast.

Transparency and Auditability

Following the election, the Denver Elections Division also piloted a third-party audit tool to make the votes cast through the blockchain fully transparent and auditable. This digital bulletin board was made available to any interested party who wanted to participate, including election observers and experts in election administration and blockchain technology. The tool enabled auditors to verify each of the following steps:

- Votes recorded in the blockchain from the voter's device;
- Votes recorded on ballot images extracted from the blockchain; and
- Votes recorded in the tabulation system from the cast vote record.

The data was verified against the anonymized voter-verified digital receipt. To ensure voter anonymity during the public audit, all variable races were redacted on the digital receipts, ballot images, cast vote record, and block explorer. Eighteen independent auditors participated in the initial audit following the Municipal General Election. All auditors confirmed the accuracy of the cast vote record against the voter-verified digital receipts. Recommendations were made to clarify eligible write-in votes and to enable users to track the ballots verified as they proceed through the audit. Those changes were made ahead of the audit for the June 4th Run-Off Election.

Results and Findings

Overall, the pilots in the Municipal General and Run-Off Elections were successful. A total of 120 voters cast ballots using the app in the May 7th Municipal Election, and 112 voters cast ballots in the June 4th Run-Off. This turnout was more than double the UOCAVA turnout in the 2015 Municipal Election, suggesting that the more convenient voting method may have encouraged more voters to participate. In surveys of voters who participated in the pilot, they unanimously stated they preferred to vote through the mobile app over any other method of voting in the future. And the third-party audit demonstrated successfully that the votes cast over the blockchain were recorded and tabulated accurately.

In the future, this technology holds the promise of making voting easier not only for UOCAVA voters, but also voters with disabilities. Voatz also plans to enhance its digital bulletin board to enable voters to verify their votes were recorded properly on the blockchain and tabulated in the elections office accurately – offering an end-to-end verifiable election system.

Attachment 1: Screenshots from the Mobile App
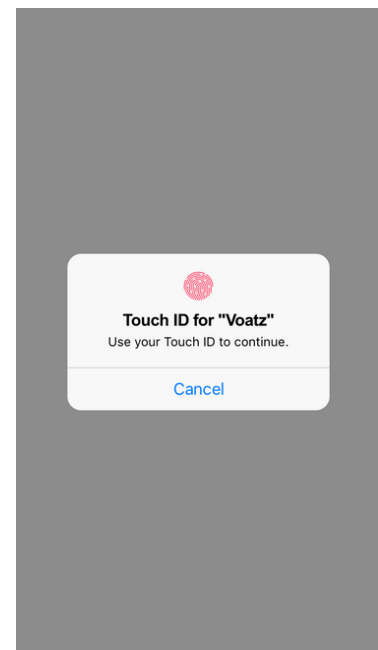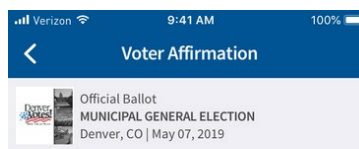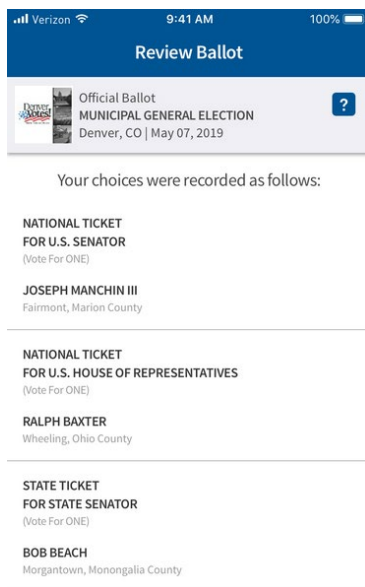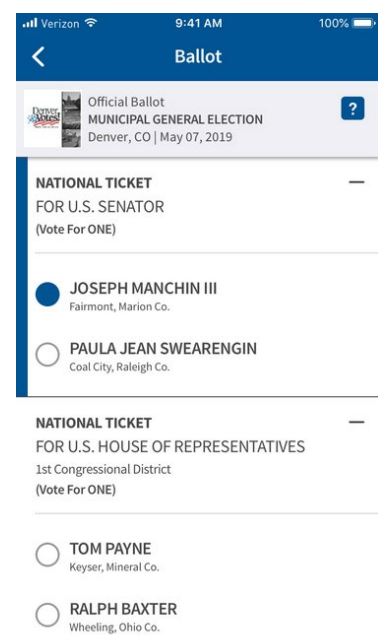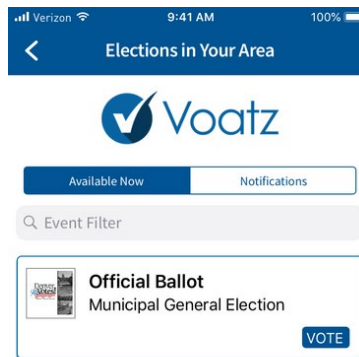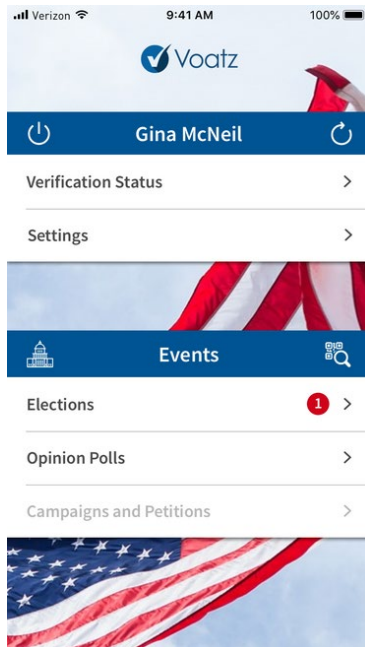
Attachment 2: UOCAVA Voter Turnout in 2011, 2015 and 2019

2019 Municipal General Election

Total Eligible Voters: 3858

Total Accepted: 288

Total Electronic Ballot Delivery: 2967

% Electronic Ballot Delivery of Total Eligible: 76%

% Accepted of Total Eligible Electronic Ballot Delivery: 9.7%

*Does not include returned Mail ballots, but includes ballots voted electronically and returned via mail

Breakdown of Electronic Ballot Return

Democracy Live Email Return: 136

Voatz Mobile Voting Pilot Project: 120

Mail/Fax: 17

Accessible Voters through Democracy Live: 12

Emergency Replacement Ballots: 3

UOCAVA Voter Report

2011 Municipal General Election
Total Eligible Voters*: 428
Total Accepted: 91
Total Electronic Ballot Delivery: 49
% Accepted of Total Eligible: 21%
% Electronic Ballot Delivery of Total Eligible: 11%

2015 Municipal General Election
Total Eligible Voters: 2,498
Total Accepted: 273
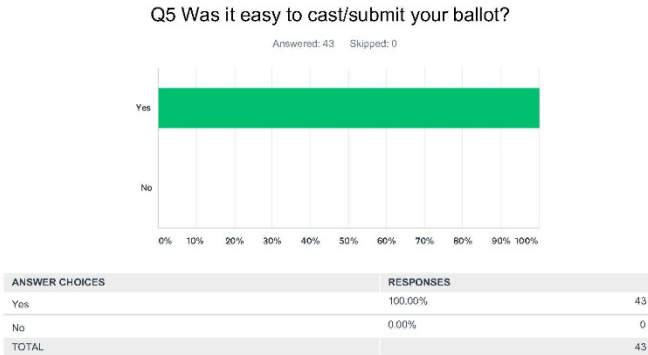Total Electronic Ballot Delivery: 116
% Accepted of Total Eligible: 11%
% Electronic Ballot Delivery of Total Eligible: 5%

*Legislation was passed in 2011 after the Municipal General Election that allowed all Overseas Permanent Residents to participate in Municipal Elections. This is reflected in the difference of total eligible voters from 2011 to 2015.
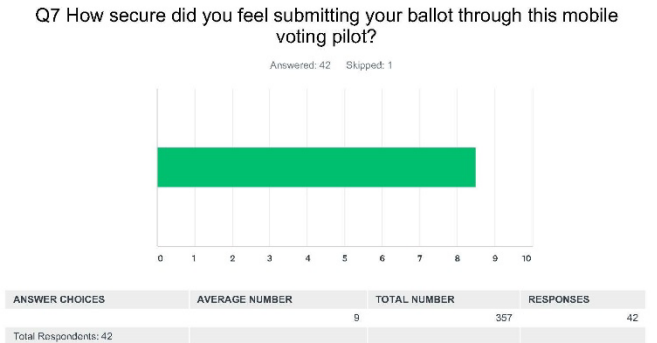
Attachment 3: Survey Results

Q5 Was it easy to cast/submit your ballot?

Answered: 43   Skipped: 0

ANSWER CHOICES	RESPONSES	
Yes	100.00%	43
No	0.00%	0
TOTAL		43

Q7 How secure did you feel submitting your ballot through this mobile voting pilot?

Answered: 42   Skipped: 1

ANSWER CHOICES	AVERAGE NUMBER	TOTAL NUMBER	RESPONSES
	9	357	42
Total Respondents: 42			

Q6 What would you change about casting/submitting your ballot, if anything?

Answered: 28   Skipped: 15

#	RESPONSES	DATE
1	Nothing	5/7/2019 11:07 PM
2	Nothing.	5/7/2019 6:53 AM
3	None	5/6/2019 9:05 PM
4	Nothing. It was very simple.	5/6/2019 6:50 PM
5	None	5/6/2019 3:54 PM
6	Nothing	5/6/2019 2:28 PM
7	Nothing	5/6/2019 1:25 PM
8	Nothing	5/6/2019 5:36 AM
9	My phone wasn't new enough to use the app so I had to use my partner's. Not much you can do there.	5/2/2019 4:26 PM
10	I wasn't entirely sure that I had done all that needed to be done.	5/1/2019 3:09 PM
11	Nothing	4/29/2019 4:13 PM
12	Nothing. This was so much easier than the past process for overseas absentee.	4/29/2019 4:08 PM
13	Nothing	4/29/2019 4:08 PM
14	Nothing. I was very pleased with this process.	4/28/2019 3:01 AM
15	nothing	4/24/2019 3:01 AM
16	Nothing, it was straightforward and easy	4/22/2019 5:09 AM
17	Nothing	4/20/2019 12:38 AM
18	Nothing	4/16/2019 1:48 AM
19	nothing	4/14/2019 1:08 PM
20	nothing	4/10/2019 1:37 PM
21	Nothing, this was a lot easier than printing out the entire ballot, signing it, scanning it, and then emailing it to the voting office.	4/8/2019 4:18 PM
22	nothing. this is a great advancement.	4/8/2019 4:08 PM
23	nothing	4/3/2019 2:31 AM
24	Nothing	3/29/2019 2:35 PM
25	Nothing	3/29/2019 1:30 PM
26	Nothing	3/29/2019 12:26 PM
27	Nothing	3/28/2019 12:01 PM
28	nothing	3/25/2019 11:50 AM

Q9 What method do you prefer to submit your ballot?

Answered: 43   Skipped: 0

ANSWER CHOICES	RESPONSES	
Via secure mobile voting (this pilot project)	100.00%	43
Via e-mail	0.00%	0
Via fax	0.00%	0
Via postal mail	0.00%	0
TOTAL		43
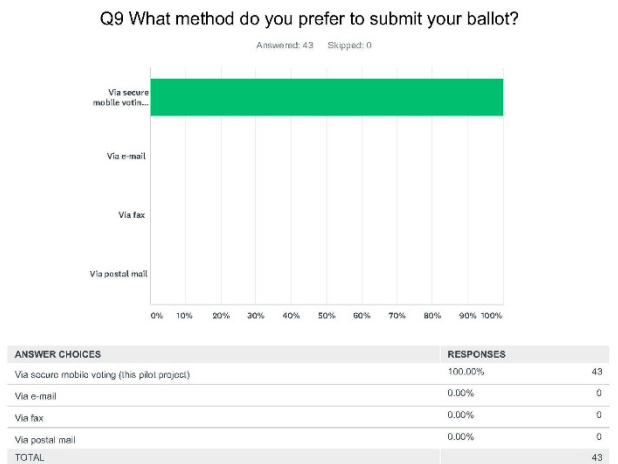
Attachment 4:

Below you'll find a screen shot of the Audit Tool used by third party auditors to audit the voter-verified digital receipt against the scannable ballot extracted from the blockchain.

Here also is a link to the Facebook Live Video from the May 9, 2019, Public Demonstration of the Audit Tool:
https://www.facebook.com/DenverElections/videos/625783547868833/

Attachment 5:

Smartphone voting is underway – inside the most radical voting system in America: Pioneering election in Denver showcases the promise and unresolved challenges facing digital revolution in election|By STEVEN ROSENFELD | steven@ind.media | Salon PUBLISHED: May 27, 2019 at 12:29 pm (https://www.salon.com/2019/05/27/smartphone-voting-is-underway-inside-the-most-radical-voting-system-in-america_partner/)
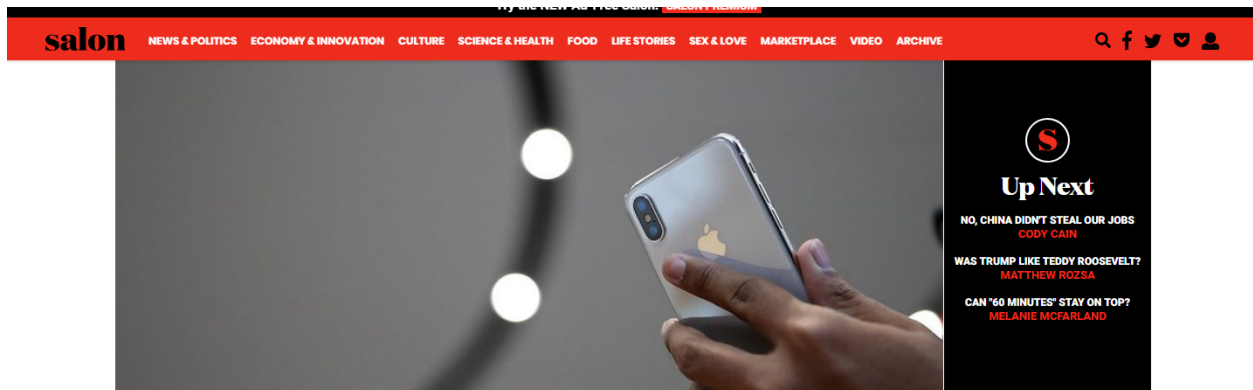
(Justin Sullivan/Getty Images)

Smartphone voting is underway — inside the most radical voting system in America

Pioneering election in Denver showcases the promise and unresolved challenges facing digital revolution in election

STEVEN ROSENFELD
MAY 27, 2019 12:29PM (UTC)

This article was produced by Voting Booth, a project of the Independent Media Institute.

Two days after May's city elections, Denver's Elections Division held a low-profile audit of key parts of America's most radical new voting system.

Over several weeks, 119 residents who were overseas had been using their smartphones