Election 2020 – Digital Solutions for Voting Reform and Election Reporting

2021 NASCIO Submission
Digital Services: Government to Citizen

Project Start: November 2019
Project Completion: November 2020

David Naisby, CIO, Employment, Banking and Revenue Delivery Center
Julie Snyder, CIO, General Government Operations Delivery Center

COMMONWEALTH OF PENNSYLVANIA Office of Administration

Executive Summary

On October 31, 2019, Governor Tom Wolf signed bipartisan legislation to enact the most substantial changes to Pennsylvania's Election Code in over 80 years, making voting more convenient, secure and modern. Primary provisions of the bill included:

- No excuse mail-in voting
- 50-day mail-in voting period
- Permanent mail-in and absentee ballot list
- 15 more days to register to vote
- Extends mail-in and absentee submission deadlines
- $90 million bond funding for new county voting machines with paper trails to enhance security

Modifications were needed across multiple public-facing and internal applications to have the required changes in place in time for the primary election scheduled for April 2020. This meant that both online and offline no excuse mail-in ballot requests needed to be in place by February 2020 to meet the 50-day threshold, and system logic and application changes were also needed to support the extension of voter registration timelines. The changes to voting also required enhancements in the state election reporting system to account for the change in vote methods and increased traffic.

Working in conjunction with Pennsylvania Department of State elections business owners and vendor resources, the Act 77 project team successfully integrated the system enhancements within four months of the initial project launch using the Agile methodology. Features were integrated over the span of four sprint release cycles using flexible planning and shorter delivery times, while maintaining the quality and integrity of system development.

Pennsylvania also implemented a robust, cloud-native architecture to support real-time updates of election results. Data was provided at both the aggregate and detail level and ultimately served 1.6 million queries on election night and the several days of intense interest that followed as mail-in ballots counting continued. The enhanced reporting capabilities provided greater of speed, accuracy and transparency to citizens, media outlets and candidates in this highly competitive battleground state, at a time when concerns about election security and integrity were especially high.

With the onset of the COVID-19 pandemic in early 2020, the availability of mail-in voting proved critical to election turnout, accounting for nearly 38 percent of all votes cast, compared to less than 6 percent in previous presidential elections.

Idea - Business Problem and Solution

Following the signing of Act 77 of 2019, an analysis by the Pennsylvania Department of State, Office of Administration, and the Employment, Banking, and Revenue (EBR) Delivery Center determined that the level of modifications required across all state election applications could not be completed with the existing development support resources within a six-month project window.

Projected modifications were needed across multiple public-facing and internal applications supporting the PA Department of State including:

Application	Description
Online Voter Registration (OVR)	Public online application for submitting voter registration requests
Absentee Ballot Application	Public online application for submitting voter absentee ballot requests
Online Voter Registration Drive (OVR Drive)	Third Party integration of voter registration
Election Night Returns	Summary of Election Results
OVR Web API	Integration with third party agencies for allowing submission of voter registration and ballot applications requests
Statewide Uniform Registry of Electors (SURE VR) and SURE Portal	Internal system of record for voter registration, ballots, voter history
VOTES PA (new voter registration forms)	Central Repository for voter information, forms, and links to online applications

Working in conjunction with PA Department of State elections business owners and vendor resources, the Act 77 project team successfully integrated the system enhancements within four months of the initial project launch using the Agile methodology. Features were integrated over the span of four sprint release cycles using flexible planning and shorter delivery times, while maintaining the quality and integrity of system development. Even with the aggressive schedule, features were introduced with little to no post-production defects as a result of exceptional work superiority and productivity.

In addition to the system modifications required for the implementation of Act 77, a joint project was launched to develop a public-facing near-real time election night reporting dashboard, as election results were available for download only from the PA Department of State.

Implementation

Act 77 -PA Election Reform Modifications

The Act 77 project was launched the last week of November 2019 with support from both the Governor's Office and the Department of State. Initial discussions took place with the Department of State business owners/stakeholders to identify the scope of the modifications. Under the pre-existing project model and development team resources, the scope of work estimated over 12,000 development

hours spanning a period of 12-18 months. With the aggressive model, the time needed to be reduced to four months.

Microsoft Team Foundation Server (TFS) was used for managing the sprint cycles, resource workload, requirements, development code versioning, testing, metrics and reporting. By incorporating the Agile methodology and dividing the components into the appropriate Sprints based on functionality needed, we were able to accurately forecast the quantity of resources needed to meet the timeline.

With the need to expand resources quickly, the Office of Administration tapped into its shared services delivery model to identify skilled enterprise-wide technology employees supporting other commonwealth applications and migrate them onto the Act 77 project. Business stakeholders, business subject matter experts, infrastructure resources and security groups were also instrumental in ensuring a successful completion.

Project Development Resources

Resource Type	Original Team Members	Act 77 Project Team Members	Change
Project Manager	0.5	1	+100%
SRUM Master	0.5	1	+100%
Developers	7	20	+185%
Business Analyst (BA)	2	7	+250%
Quality Assurance (QA)	1	4	+300%
Other (Sys Admin, DBA)	1	3	+200%
Total	**21**	**36**	**+72%**

> "These IT employees from the Office of Administration played an essential behind the scenes role in preserving our proud democratic tradition of free and fair elections."
>
> ———————
> Governor Wolf

PA Election Reporting Enhancements

The Commonwealth of Pennsylvania, in partnership with Microsoft, also implemented a robust, cloud-native architecture to support real-time updates on post-election status. A cloud-native architecture enabled rapid engagement and deployment without the burden of legacy licensing, hardware and configuration. A complete data lake, data transformation pipeline and enterprise-ready reporting solution was architected, built and deployed over a period of 10 days. Data was provided at both the aggregate and detail level and ultimately served 1.6 million queries on election night and the several days of intense interest that followed with no issues, leveraging the cloud to scale on demand (blue section moved to benefits). Technologies leveraged included Microsoft Azure Data Lake for data storage, Microsoft Azure Data Factory and Microsoft Azure Databricks for data loading and processing. Microsoft Azure SQL Database was used to hold the processed data and Microsoft Power BI served as the end-user facing reporting interface.

While both initiatives required detailed plans, expediency in completion and sponsorship at the most senior levels of the commonwealth, dedication and commitment to quality by all resources involved proved to be instrumental in the overall success.

Completion Timelines

The Act 77 project began the week of November 2019 and was delivered in time for the 2020 primary election.

Release #	Release Date	Summary
Release 1	December 2019	Candidate Petition Filing Form Revisions
Release 2	January 2020	Online Absentee and No Excuse Mail-In Ballot Applications SURE, Application Module
Release 3	March 2020	Integrated Voter Registration and Ballot Application, Online Ballot Status Tracking, Poll Book Watermarks, Reporting
Release 4	March 2020	Poll Book and Mailing Ballot Labels

The PA Election Reporting project began during the last week of October 2020 and was delivered in time for Election Day, November 3, 2020.

Impact and Benefits

As the Act 77 project team worked to implement the modifications needed to support election enhancements, cases of coronavirus (COVID-19) began to increase across Pennsylvania and the nation. Introduction of the online mail-in ballot application process proved to be an instrumental enhancement to the election process during the pandemic. The convenience and safety of mail-in ballot contributed to a record turnout of over 6.9 million Pennsylvanians in the 2020 presidential election.

Historical results indicate that absentee and mail-in ballots (excuse required) accounted for less than 6% of the vote in comparable presidential elections since 2000. The integration of the enhancements to mail-in voting resulted in mail-in and absentee voting representing 2.6 million (37.94%) of the 6.9 million votes in the 2020 presidential election.
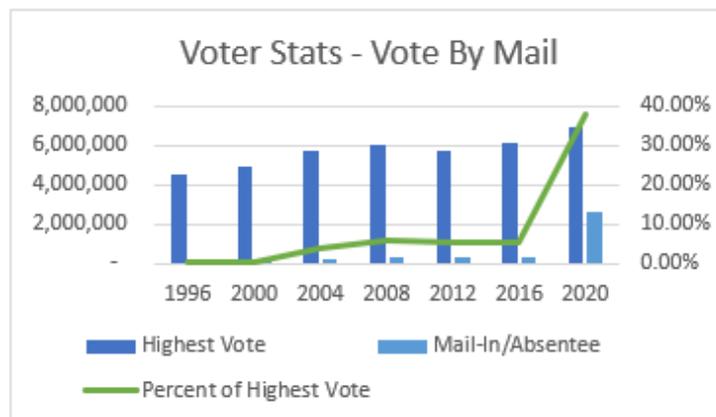
Modifications to PA Election Reporting proved to be just as instrumental in providing digital services to the public. The refresh of the display of election-returns data included an update to the Department of State's website to catalog votes cast by mail and in-person, as well as the creation of a supplemental dashboard to show ballots that have not yet been counted, broken down by county. Visitors to votesPA.com/Counting were able to see the total number of mail ballots that were cast and counted as those numbers were reported by the counties. The dashboard also displayed the number and percentage of precincts for which polling place voting results had been reported by the counties. In the days after the election, data on provisional ballot counts was also available. Data was provided at both the aggregate and detail level and ultimately served 1.6 million queries on election night and the several days of intense interest that followed with no issues, leveraging the cloud to scale on demand.
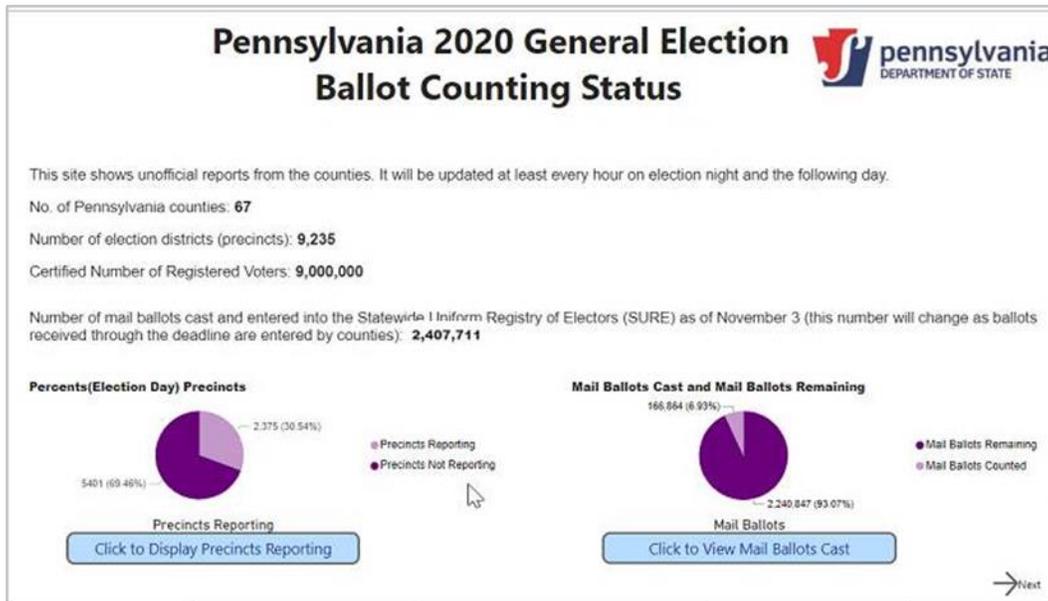
Note: Data and content is for illustrative purposes only and not representative of actual results

"The efforts of the IT ACT 77 team from EBR and GGO Delivery Centers enabled Pennsylvania to implement no-excuse mail-in voting in an extremely short time frame during a global pandemic and in a presidential election year that excited great public interest. As a result of the new secure mail-in voting option, Pennsylvanians could vote from the safety and convenience of their own homes, and we saw record voter turnout in the November 2020 election."

Acting Secretary of State Veronica W. Degraffenreid

In addition to meeting the timeframes for implementation required by law for the 2020 election cycle, Pennsylvania's voting and election reporting modernization efforts have brought added transparency and confidence to the democratic process and all future elections in the Keystone State.