

CASE STUDY

Innovating Voter Registration **ON CAMPUS**

Carnegie Mellon University modernized voter registration drives on campus, becoming the first educational institution in the country to adopt a voter registration application programming interface.

EXECUTIVE SUMMARY

In 2024, Carnegie Mellon University (CMU) made registering to vote more efficient for students by integrating a voter registration application programming interface (API) directly into its student information systems. By placing voter registration where students already manage their school records, CMU removed common barriers to registration and provided students with a more convenient way to participate in the electoral process. This method also calmed long-standing concerns among county election officials, who frequently encountered problems with students providing inaccurate or incomplete addresses on their registration applications. As a result, this simple change registered about 10% of eligible students on the Pittsburgh campus during the initial pilot semester.

The use of APIs for student voter registration purposes not only simplifies a core civic process, but also sets a new standard for how educational institutions can use technology to foster community engagement. This solution can simultaneously:

- **Minimize paperwork and errors** by using online voter registration tools and pre-filling students' forms with verified information. This includes standardized university addresses, which improves data quality and processing for election officials.
- **Increase student participation** by reducing registration barriers and providing more convenient registration pathways.
- **Shows how educational institutions can lead in civic engagement** through innovative approaches to voter registration.

CMU's success demonstrates that integrating voter registration directly into existing student systems is possible, secure, and practical. It also underscores the importance of robust partnerships between schools, election officials, and civic organizations in advancing civic goals. This model can transform voter registration from a paper-intensive, error-prone process into a more user-friendly digital experience, serving students, institutions, and election officials.

BACKGROUND *and* **CONTEXT**

Voter Registration at CMU

Before 2019, voter registration efforts were primarily organized by student groups with limited coordination and formal promotion. While these efforts were overall successful in registration and impact, their decentralized approach made them challenging to manage, to gauge their impact, and to track voter registration metrics each year.

To address these challenges, CMU established a Voter Engagement Committee in 2019. Composed of students, faculty, state, and community partners, this committee provided a roadmap for student empowerment and increased civic participation, allowing each partner to take ownership and contribute toward shared strategic goals. In 2022, this committee — along with the Office of Student Leadership, Involvement, and Civic Engagement — released a [comprehensive, multi-year strategy](#) to strengthen voter participation on campus. That plan was [updated in 2024](#), outlining CMU's intention to use an API as a tool to enhance voter registration.

Pennsylvania's Registration Infrastructure

Pennsylvania wasn't the first state to implement online voter registration, but it was the first to create a robust voter registration API. In 2016, just one year after launching its online voter registration form, the Pennsylvania Department of State implemented a secure, internet-based service to increase voter registration access further and reduce processing times.

This technology enabled third-party organizations — including educational institutions — to integrate voter registration capabilities directly into their systems. While each organization may approach integration differently by prioritizing design that best suits their needs in the spirit of fostering civic involvement, the underlying pieces of the process and registration fields remain the same thanks to this technology. Since its inception in 2016, numerous organizations have submitted over 485,000 applications through the state's API. The introduction of CMU's application into this ecosystem highlights the success and effectiveness of this option.

Planning and Partnership

CMU has a long history of encouraging eligible students to register and vote, often working with nonpartisan organizations to increase voter participation. One key partner, the Students Learn Students Vote (SLSV) Coalition, connects educational institutions, students, and other partners to achieve stronger civic participation.

In 2023, the SLSV Coalition and the Institute for Responsive Government proposed that CMU use Pennsylvania's voter registration API to modernize operations and strengthen registration rates on campus — a natural fit for a university known for technology, research, and innovation. This shift would enable CMU to move beyond traditional paper-based voter registration drives and embed registration directly into the university's existing systems.

Design

For its initial integration with Pennsylvania's voter registration API, CMU adopted a lightweight development approach. The system leverages the university's single sign-on process, known as AndrewID, so only active students can access it. This setup maintained security and relied on student authentication and data systems.

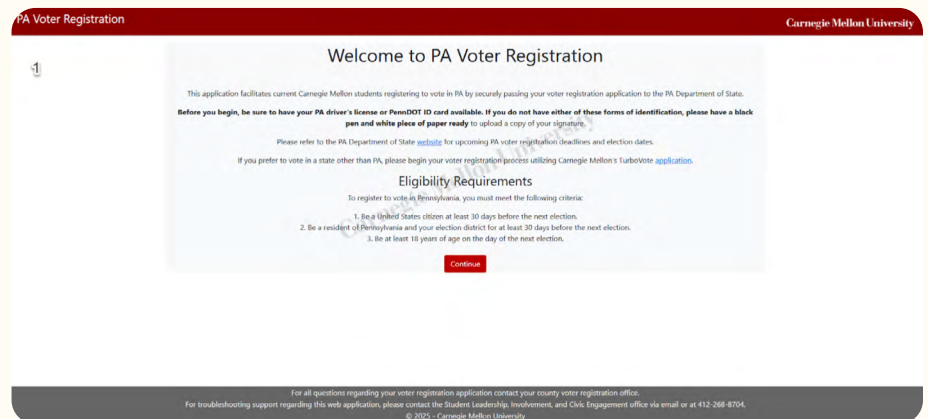


Figure 1. Entry page with eligibility criteria.

The university initially launched its application to on-campus students as a minimum viable product, strategically placing links on high-traffic university webpages and relying on robust communication channels and on-campus engagement. Upon single sign-on authentication, students were presented with an integrated electronic registration form pre-filled with their first name, last name, and residential address if they lived on campus. Students then added additional personal information, such as their date of birth, an address for students living off-campus, and either their driver's license number or the last four digits of their social security number, among other fields. Despite having the capability to pre-fill some of this information, CMU chose to prioritize security by allowing students to provide sensitive details and to limit access to systems containing such data.

2 General Information

First Name *

Middle Name/Initial

Last Name *

Suffix

Phone

Email

Gender

Race

Are you a United States citizen? *

Will you be 18 years or older on or before election day? *

Date of Birth *

Reason for application *

Political Party *

Suffix

###-###-####

Gender

Race

Yes

No

Yes

No

Next election is 11/04/2025

mm / dd / yyyy

Select Reason

Select Party

To vote in a primary, you must register with either the Democratic or Republican party.

Figure 2. Portion of CMU's electronic form.

CMU's application complies with Pennsylvania's voter registration form, matching mandatory and optional fields. It also includes voter qualifications and eligibility, ensuring a uniform experience throughout the state.

Development

The university used a combination of in-house staff and external support to design and develop the application. Before assembling the front-end application, they prioritized developing the back-end structure and data handling to conform to Pennsylvania requirements.

A core design choice was the "catch and release" approach to data handling: The system temporarily uses student information to complete the registration, but does not store it after submission to the Pennsylvania Department of State. Only essential metadata, such as the AndrewID, is retained for reporting and auditing. This process improved performance and eliminated the need to store sensitive information.

Reporting

To track registration submissions via the API, CMU created a simple reporting tool that enabled staff to review submissions, troubleshoot issues, and assist with application resubmissions when needed. The initial version displayed the student's AndrewID. It provided key details, such as whether the registration form was submitted successfully and if a response was received from the Pennsylvania Department of State. This proved essential, as some students assumed they had registered when, in fact, errors had prevented them from completing the submission. Campus organizers were able to monitor this report and follow up to ensure these students could participate.

Trusted Partners

Trusted partners also played a crucial role in supporting and financing this project. Specifically, the Students Learn Students Vote Coalition provided grant funding to support a portion of this project for external development capacity, helping CMU to continue through a critical phase and ultimately to completion. Keystone Democracy also provided critical support, validating the importance of this project with elections officials. Other trusted partners, including third-party registration groups, assisted with student outreach and encouraged adoption of the new system.

STRONG DEBUT

During Fall 2024 student orientation week, CMU successfully launched a new, integrated voter registration process, resulting in over 850 applications. More than 620 of these applications were successfully submitted through the API to the Department of State and then to local election officials for review and processing, marking a successful inaugural debut for the API.

Despite the success and CMU's dedicated student support of the API, there were opportunities for improvement, including areas to expand additional training and troubleshooting to enhance registration rates. For example, approximately 200 of the initially submitted forms were returned with errors, which included signature contrast not recognized by the state's systems, students not accepting the declaration, or communication delays with the state's API. Most of these could be resubmitted after corrections.

**LESSONS
LEARNED**

The insights gained from the initial debut of CMU's API integration established a basis for improvement and potential future enhancements. Some critical lessons learned include:

Clear Communication

Early confusion about state requirements resulted in minor delays and reprogramming, including adjustments to address fields and the API submission format. Miscommunication also arose regarding what the API required and what students saw on the form. For example, the form must display the ward and district fields, even though filling them out is not mandatory for Pennsylvania voter registration. Clear guidance and communication upfront would have prevented rework.

Be Flexible

Inevitably, timelines can shift, or an unforeseen requirement can add development or testing time. The lead-up time for the state to develop, exchange, and validate test cases was more comprehensive, which delayed deployment during student orientation week. Building in extra time for testing and validation will help ensure the success of future projects.

Staff Continuity

When the lead coordinator moved roles midway through the project, the hand-off slowed progress. This changeover wasn't detrimental to the project, but the handoff could have been smoother to minimize delays and learning gaps. For future efforts, the CMU team plans to train multiple staff members on upcoming projects to prevent single points of failure.

State Downtime

At times, the Pennsylvania Department of State takes down the API for maintenance and enhancement. While system downtime is a normal aspect of technology management, it can temporarily disrupt voter registration. Accounting for occasional disruptions can be helpful when approaching design and implementation.

Error Handling and Monitoring

Initially, CMU's simple report didn't include in-depth explanations for system responses received from the Pennsylvania Department of State. This made it more challenging for front-line staff to diagnose and triage reporting. Staff were able to troubleshoot issues more effectively once the technical staff clarified the codes.

Robust Strategy for Launch

A voter registration API requires distinct strategies and initiatives for launch compared to development. In its first year, most of CMU's energy was invested in development and policies. But broad adoption and use require an equally robust rollout strategy, including a focus on the streamlined voter registration process during high-visibility moments (like new student orientation) and hands-on support.

FUTURE OPPORTUNITIES

Presently, CMU doesn't have any plans to modify the underlying application. However, they have identified a few opportunities for long-term enhancement.

Better Reporting

The simple report format was helpful to staff, enabling them to follow up with students to ensure a successful application. However, more precise explanations for various error codes would be beneficial. Staff would also like to automate reporting and share it with additional staff members.

Enhanced Training

Following a successful Fall registration drive and the inaugural API release, campus organizers identified opportunities to create more robust training. This includes providing in-depth troubleshooting guidance to address questions from organizers and potential issues that arise when students register to vote using the API.

Mail-In Ballot Requests

The Pennsylvania voter registration API also supports the ability to request a mail-in ballot for eligible voters, including those registering to vote for the first time. CMU opted to focus solely on voter registration when designing and releasing the API. This is an area they hope to build out when they are ready to implement more significant changes.

Greater Integration

Integrating the API's electronic voter registration form in processes that all eligible students must complete, such as class or student orientation registration.

Finer Coordination

Refining coordination with partner organizations for on-campus voter registration drives to more effectively engage students and significantly boost registration numbers. A key focus will be on innovative approaches that connect with students in their current environments.

EXPANDING
the **MODEL**

Sometimes it can be challenging to be the first, particularly when it comes to finite resources. With CMU's ingenuity in this space, they are leading the way for other educational institutions and civic groups that seek to enhance or improve their own engagement strategies. Their creativity and diligence can serve as a starting point for many organizations, helping others adopt more modern voter registration methods.

**Leveraging
CMU's
Experience**

CMU was the first educational institution in Pennsylvania to implement the state's voter registration API, and the first academic institution nationwide to integrate a voter registration API with a state entity. Their pioneering efforts offer valuable insights and opportunities for other institutions seeking to adopt a similar integrated tool. By learning from CMU's experience, others can save both time and money.

**Other
Civic Services**

This integration model can also be extended to other government services, creating more comprehensive platforms to deliver efficient and effective services to constituents and students.

CONCLUSION

A Model for Innovation

CMU's integration of Pennsylvania's API is more than a breakthrough in civic engagement – it's a call to action for higher education institutions nationwide. Other universities are encouraged to replicate this model, leveraging state-provided APIs to create more efficient and secure pathways for students to register to vote, where available.

By embedding registration directly into existing student systems, universities can move beyond traditional registration efforts and establish a robust framework for scaling voter registration outreach. It's an opportunity to maximize operational effectiveness and accuracy. Now more than ever, other universities should follow CMU's proven blueprint to further embrace technology to fundamentally transform campus civic engagement.

