Innovation in Synthesizing Big Data: The Electronic Registration Information Center (ERIC)

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Abstract Maintaining accurate, complete voter lists has been a significant and intractable problem. Many eligible voters are not on the lists, which can also be fraught with inaccuracies. These issues lead to major problems downstream in the elections process, and since so much of election reform is viewed through a partisan lens, the inaccuracies can lead to polarizing divisions. Bringing together a group of experts and election officials, a multistate data center was created, called the Electronic Registration Information Center, or "ERIC." ERIC delivers information on voters who have moved, while also allowing for outreach to those not yet registered. Born in 2012, ERIC has grown from 7 to 26 states and the District of Columbia, including states as red as Alabama, Louisiana, and Utah and states as blue as Connecticut, Illinois, and Oregon. The ERIC states govern ERIC, and pay the full costs of its operations, and security of all data is maintained through rigorous methods. Since its inception, ERIC has

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enabled states to update nearly 10 million out-of-date voter records, and reach out to over 34 million eligible but unregistered voters, with millions of these new voters registered.

Keywords Voter registration • Voter list maintenance • Electronic Registration Information Center • ERIC

The Idea

In 2008, I was working with the growing elections team at the Pew Charitable Trusts, as it was ramping up its efforts to improve American elections. As part of our work, we sought guidance from experts in the field. After the 2008 election, we hosted a bipartisan group of over 200 leaders in the field of elections—election officials at the state and local level, campaign staff, researchers, technologists, advocates, and others—to discuss the past historic election and possible election administration reforms going forward.

I talked to dozens of people, and asked them one simple question—if you could fix *one thing* in elections, what would it be? Remarkably, the answer was unanimous—voter registration. Those working in elections knew that the voter lists were incomplete, with large numbers of eligible voters not on the lists. They also understood the lists were fraught with inaccuracies and unable to keep up with Americans' mobility. These issues led to major problems downstream in the elections process, including returned mail, excess costs, long lines, unnecessary provisional ballots, and voter confusion and dissatisfaction. In addition, since so much of election reform was viewed purely through a partisan lens, the inaccuracies in the lists led to concerns about election integrity, and polarizing partisan divisions. We determined that if a solution to the voter list problem could be devised, it could ameliorate so many other problems in elections at the same time.

The Process

Beginning in 2009, we began to look for such a solution. I led the effort, assisted by John Lindback, the former director of elections of Oregon and Alaska, who built the statewide voter database in Oregon. We went in without preconceived notions, committed to looking for a real solution that would not be undermined by partisan polarization. We began by

creating a working group that included state and local election officials from both parties, researchers, and technical experts. We called this group the Voter Registration Modernization Design Working Group, or "VRooM DaWG" for short.[1]

At the beginning of the first convening of the group, I asked those in attendance one question—if we could create a voter registration system from scratch, how many would create the one we have now? Not one person raised their hand. We were all on the same page about the need to improve our system, and then we got started with the hard work of devising an improved system.

First, we had to define the nature of the problem. It was important to educate members of the working group, particularly those with technical expertise, who were less familiar with the nuts and bolts of election administration. Election officials from around the country agreed that the challenges of maintaining a complete voter lists included the following:

- Voters did not understand how voter registration worked, and when they had the responsibility to update their records;
- Voters were moving at high rates, with about one-third or more moving within a four-year cycle, sometimes multiple times. And those mobility rates were even higher among underrepresented populations, including the young and socioeconomically disadvantaged;
- Third party groups were exacerbating the problem, waiting until immediately before a major election, and then inundating election offices with paper voter registration forms, many of which were duplicates or illegible, leading to errors in the voters' records; and
- While citizens knew to update their address with other agencies, like motor vehicle agencies, those agencies were doing a poor job of forwarding that information in a usable way to election agencies.

One key member of the working group was Jeff Jonas, a data and entity-resolution expert, then a fellow at IBM working on cutting edge software that, as he puts it, enables "data to find data."[2] Lindback had worked with Jonas on a panel at the National Academies of Science, also looking at the issue of voter registration, and had come away impressed by

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[1] https://www.pewtrusts.org/~/media/legacy/uploadedfiles/pcs_assets/2010/upgradingdemocracyreportpdf.pdf.

[2] https://senzing.com/team/jeff-jonas/.

him. When I noted that we needed someone with particular technical expertise in the field of data, John immediately recommended him, and to our delight, he accepted.

As I got to know Jonas, I soon realized he was exactly what this discussion needed—a genius about data, unbound to existing election infrastructure and vendors. Jonas sat quietly absorbing the discussions for several days, and in the middle of the second meeting of the group, as we were beginning to consider how to design a solution, he spoke up. He quietly walked to the front of the room, and showed a slide he'd been working on, outlining a rough architecture for a system that could begin to address this problem. A hush literally fell over the room for what seemed like an eternity, as we began to digest his idea, the silence was suddenly broken by a gasp from a single election official. We all could see this was the way forward. This was the moment of conception of ERIC—the Electronic Registration Information Center.[3]

Put simply, we proposed creating a multistate data center, running state-of-the-art software capable of analyzing and resolving data from multiple sources, where the states would upload data from voter files and other sources with more up-to-date information (most notably, motor vehicles files), and receive reports telling them when one of their voter records was no longer up-to-date. There would need to be sufficient data points, and multiple sources of data, to minimize the number of "false positives" (where a record was erroneously matched to another with the same name, not representing the same person), while maximizing the chance that a move, or a death, would be discovered and reported. Such a data center could deliver information on voters who had moved (within or out of state) and voters who had died. States required actionable data about this—information they could immediately and confidently use to confirm possible changes to a voter's record—without having to undertake burdensome supplemental review of that data.

The technology was cutting edge, but strange as it may sound, the technology to create such a data center wasn't the biggest challenge. There were several other challenges that needed to be resolved if ERIC was truly going to be a solution that worked for the states. Several questions arose:

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[3] https://ericstates.org/.

- How would ERIC avoid the perils of being politicized, being used by partisans to feed political whims at any particular moment?
- How could ERIC obtain and protect the data it needed, which was often sensitive and protected by law?
- How could ERIC be governed in a way that was effective, nonpartisan, and transparent?

While we had the rough technical framework of ERIC by the end of 2009, consideration of these questions occupied the working group for more than two years. We began with discussing who should govern ERIC. This was a key point, as the data that ERIC required included sensitive motor vehicle data that was specially protected under both federal and state law, which could not be shared with non-governmental entities in most circumstances. Furthermore, ERIC needed to remain above the partisan fray, and to maintain a level of transparency that would keep it that way. Finally, ERIC would need staff that could dedicate time to effectively manage a complex data system, and coordinate with the member states. The group agreed that no existing entity fit all these requirements, and therefore we resolved to build a new nonprofit membership organization. The ERIC nonprofit corporation would have bylaws and a membership agreement, and be governed, with operating expenses paid, by the member states.

It was essential that the bylaws and membership agreement allowed for the states to govern ERIC effectively, but also bound all the states to a common, non-ideological set of requirements.[4] If ERIC was to succeed, the left and right could not utilize it, or be perceived to utilize it, for different purposes to meet their differing agendas. Conventional wisdom suggested that those on the left were primarily concerned with more complete voter lists (with more registered voters), while those on the right were primarily concerned with cleaner voter lists (ensuring those no longer eligible were removed). Both are important goals, and we determined that ERIC *must* achieve both to be successful. Therefore, the terms of the bylaws and membership agreement made clear that states were required to use ERIC data both for reaching out to new voters and for list maintenance to begin the process to remove records that no longer reflected an eligible voter in their state, consistent with federal law. And, importantly,

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[4] https://ericstates.org/wp-content/uploads/2019/01/ERIC_Bylaws_2018-11-30.pdf.

the states would have to document their compliance with both aspects of membership in ERIC, or be automatically removed from membership.

The member states would each select a representative to serve on the board of directors (almost always the state election director) and, therefore, states were essentially, and legally, sharing data with themselves. Using a technique called one-way hashing, confidential data such as driver's license number, the last four digits of the Social Security number, and even the date of birth would be protected by scrambling that data into long strings of alphanumeric characters, unreadable by humans and nearly impossible to reconstruct.[5] The data would be stored in dedicated servers located within the United States, subject to very high physical and virtual security.

The Birth of ERIC

Thus, after over three years of analysis and planning, ERIC went live in the summer of 2012. A bipartisan group of seven "pioneer" states led the way—Colorado, Delaware, Maryland, Nevada, Utah, Virginia, and Washington. Four of these states were led by Republican election officials, with three led by Democrats. These states received their first ERIC reports, indicating millions of eligible citizens who were not registered to vote. The states contacted each of these "eligible but unregistered" citizens (or "EBUs" as ERIC calls them), with hundreds of thousands of them registering before the presidential election that year. Within several months, ERIC had a staff consisting of Lindback as executive director, a man who's forgotten more about voter list maintenance than most of us will ever know, and Ericka Haas, the brains behind Oregon's voter list and one of the nation's most knowledgeable people about the interplay between voter and Department of Motor Vehicles (DMV) data, as the ERIC Systems Engineer.

The courage of the first ERIC states, and ERIC's initial staff, really cannot be overstated. Nothing like ERIC had ever been built before. While ERIC was being built, we were often asked to analogize ERIC to something that already existed. But ERIC was the first effort of its kind—a voluntary consortium of states working together to govern and fund a sophisticated technical endeavor. The early members of ERIC didn't know for sure if it would work, or if the data would be of high quality. Similarly, the initial ERIC staff was taking a big chance. Both Lindback and Haas

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[5] https://www.nytimes.com/2018/11/05/technology/unregistered-voter-rolls.html.

left comfortable jobs to take a chance on a nonprofit technical start-up. Fortunately, the planning that went into the creation of ERIC paid off, and the confidence of ERIC's early adopters was repaid in full.

How ERIC Works

As discussed earlier, when a state joins the ERIC community, they agree to several responsibilities, all designed to make ERIC effective, efficient, secure, and sustainable.

Governance and Budget

Each state agrees to help govern ERIC, by participating as a member of the board of directors, and paying for the operating expenses of ERIC. When states join, they each pay a flat, one-time membership fee of $25,000, and annually, the states contribute dues relative to the size of their population (e.g. Delaware pays less annually than Pennsylvania). Currently the annual budget of ERIC is under $1 million, paid entirely by the member states. And because ERIC's budget does not increase substantially as more states join, member states see their annual dues *decrease* over time, as the quality of data increases with more member states.

List Maintenance

ERIC provides each member state with four list maintenance reports—in-state moves (voter has a more recent address in another state record, usually motor vehicles), cross-state moves (voter has a more recent address in another ERIC state), deaths (as determined by a high-confidence match to the Social Security master death list), and duplicates (one individual has more than one record on the same state's voter list). States commit to conducting list maintenance using ERIC reports approximately annually, at a minimum (though some do it more often), and to do so in compliance with the National Voter Registration Act, which requires contact with a voter who has moved out of state prior to removal from the list.[6]

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[6] 52 U.S.C. 20507. https://www.law.cornell.edu/uscode/text/52/subtitle-II/chapter-205. If a state sends a voter who has moved out of state a mailing, and that voter does not respond to the mailing, the state moves that voter to inactive status. If an inactive voter tries to vote before two federal general elections have passed, they are instantly activated and

Outreach

ERIC also provides each state with a list of "eligible but unregistered" voters, or "EBUs," who are eligible citizens who have a record in the state's motor vehicles database (or other data provided by the state) who do not have a matching voter record. Each state commits to contacting all eligible voters on this list at least once every two years, prior to the next federal general election. The first time a state does this outreach the list is substantial—roughly equaling approximately 25% of the eligible voter population in the state. Subsequent outreach is more manageable, as states are only required to contact each potential registrant once, with only new matches included in the outreach.

Documentation and Transparency

The membership agreement clearly mandates that states document and certify their compliance and outreach, and provide that information to ERIC. If a state fails to meet this requirement, they are automatically removed from membership.

Confidentiality of Private Information

Since some of the data that flows through ERIC is sensitive, the member states have gone to great lengths to protect the transmission and storage of that data. As discussed above, sensitive data goes through a one-way hashing process—*twice*—so that even the states themselves couldn't reconstitute the confidential fields (they would not need to, of course, since they've got the original source data). Moreover, the states agree not to disclose or release any of the data included in the ERIC reports unless required by a court, so that personal information is adequately protected.

ERIC Now and in the Future

ERIC is almost seven years old, and it has grown from those initial 7 states, to now include 26 states plus the District of Columbia. These include states as red as Alabama, Louisiana, and Utah, and states as blue as

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allowed to vote. If they fail to vote or contact the state, they can be legally removed from the list after the second federal general election passes.

Connecticut, Illinois, and Oregon. Georgia just became the most recent state to join, and more states are poised to join prior to the 2020 election, as they have passed laws enabling their membership.

Nearly half of the eligible voter population of the United States lives in an ERIC state, and with the new states, ERIC's membership will likely exceed half of the voting population by the end of 2019. Those voters are seeing real, tangible benefits, even if they might not realize it. Voters in ERIC states are more likely to have voter records that are up-to-date, meaning fewer problems when they go to vote. In states with same-day registration, those voters are less likely to need to rely upon same-day registration to update their addresses, because the state has already updated their records. [7] And the ERIC states are seeing a reduction in costly returned mail, because voters' addresses are more likely to be accurate.[8] All this has occurred as the early members of ERIC have enjoyed a significant reduction of approximately one-third in their annual dues.[9]

ERIC has also managed transition. After serving as ERIC executive director for three years, Lindback retired, and the ERIC states conducted a search for the next executive director, hiring Shane Hamlin for the job. Hamlin was an integral part of the working group that created ERIC. As the state election director for Washington State he led many of the discussions that created the ERIC we know now, and in fact served he as the very first ERIC board chair when Washington was among the first states to join. Though ERIC has gone from a board of only 7 state members to 26 members, it has managed that transition, with virtually all votes of the board being unanimous, despite the political and regional diversity.

And the results of ERIC's strong and effective leadership have been remarkable. Since its inception, ERIC has enabled states to update their records to reflect over 7 million in-state moves that previously had gone

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[7] https://electioninnovation.org/2018/03/12/minnesota-registration-errors-decline/. For instance, after joining ERIC in 2014, Minnesota saw a substantial drop in the need for same-day registration in 2016 (compared to 2012), without any drop in overall registration or participation.

[8] https://www.pewtrusts.org/en/research-and-analysis/articles/2014/10/16/eric-reduces-undeliverable-ballots-in-king-county-washington. King County, Washington, saw more than one-third reduction in returned mail after the state joined ERIC.

[9] https://ericstates.org/wp-content/uploads/2019/01/FINAL_ERIC_2017_Annual_Report.pdf.

undetected. That means over 7 million individual voters who could be contacted by election officials to inform them about their next election, what was on their ballot, where to vote, and who could vote without any hassle or delay. [10]

ERIC has identified for the states over 2.5 million records that were out-of-date because the voter had moved to another ERIC state. Those voters were contacted, and the process for cleaning those records from the lists could begin, consistent with federal and state law. Over 240,000 voters who had died since they last voted were similarly identified for the states. When states can accurately and effectively maintain their voter lists with data such as this, it significantly tones down the rhetoric around potential voter fraud, and can help foster an environment of voter confidence and security.

Finally, and perhaps most impressively, ERIC has helped its states reach out to over 34 million eligible but unregistered voters over the last several years. The data from recent elections is still being analyzed, but we know that over *5 million* of these new voters registered, and it's likely that the number is significantly higher. This is probably the single most effective voter registration effort in history, and it's all been driven by the states themselves, in a completely nonpartisan way.

ERIC isn't the only solution necessary to improve our election system. Other innovations like online voter registration, and digital automation of the motor voter process, can greatly enhance the quality and completeness of the voter lists, in conjunction with ERIC. But ERIC has proven itself to be an integral part of the solution, and its governance structure, in particular, is an innovation that may yield benefits for decades to come.

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[10] https://ericstates.org/statistics/.